FIG. 2 (sheet 51 of 91)

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Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys                (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys          (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys    (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa'    (SEQ ID NO: )
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FIG. 2 (sheet 52 of 91)

Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 53 of 91)

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Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Cys Thr Gly Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Cys Thr Gly Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Thr Gly Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Gly Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Cys Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO: )
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FIG. 2 (sheet 54 of 91)

Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 55 of 91)

Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Xaa' Xaa' Tyr Ala Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 56 of 91)

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Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
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FIG. 2 (sheet 57 of 91)

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Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys  (SEQ ID NO: )
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FIG. 2 (sheet 58 of 91)

Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)

FIG. 2 (sheet 59 of 91)

Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Xaa' Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)

FIG. 2 (sheet 60 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 61 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 62 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 63 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)

FIG. 2 (sheet 64 of 91)

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Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa'        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys             (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa'   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys        (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys   (SEQ ID NO: )
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FIG. 2 (sheet 65 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 66 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 67 of 91)

Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Xaa' Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 68 of 91)

Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 69 of 91)

Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 70 of 91)

Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 71 of 91)

Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 72 of 91)

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Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
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FIG. 2 (sheet 73 of 91)

Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 74 of 91)

Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Xaa' Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 75 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 76 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 77 of 91)

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Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys  (SEQ ID NO: )
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FIG. 2 (sheet 78 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)

FIG. 2 (sheet 79 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Xaa' Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 80 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 81 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)

FIG. 2 (sheet 82 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' (SEQ ID NO:)

FIG. 2 (sheet 83 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Xaa' Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa'	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys	(SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys	(SEQ ID NO:)

FIG. 2 (sheet 84 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 85 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)

FIG. 2 (sheet 86 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Xaa' Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)

FIG. 2 (sheet 87 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 88 of 91)

Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Xaa' Cys Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Xaa' Thr Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Xaa' (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Xaa' Gly Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Xaa' Cys (SEQ ID NO:)
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Xaa' (SEQ ID NO:)

FIG. 2 (sheet 89 of 91)

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Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa'            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys                 (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Xaa' Thr Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Xaa' Gly Cys  (SEQ ID NO: )
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FIG. 2 (sheet 90 of 91)

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Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa'            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys                 (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Xaa' Gly Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa'            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys                 (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys            (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Cys  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Xaa'  (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Xaa'  (SEQ ID NO: )
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FIG. 2 (sheet 91 of 91)

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Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa'                (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa'          (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Xaa'    (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa'                   (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa'             (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa'       (SEQ ID NO: )
Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' Xaa'  (SEQ ID NO: )
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FIGURE 3 (sheet 1 of 68)

Cys Glu Tyr Cys Ala Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Val Gly Cys Tyr

FIGURE 3 (sheet 2 of 68)

Cys Glu Tyr Cys Asn Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Gly Ala Cys Tyr

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FIGURE 3 (sheet 3 of 68)

Cys Glu Tyr Cys Gln Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys His Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys His Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys His Asn Pro Ala Cys Val Gly Cys Tyr

FIGURE 3 (sheet 4 of 68)

Cys Glu Tyr Cys His Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys His Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys His Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys His Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys His Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys His Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys His Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys His Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys His Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys His Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys His Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys His Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys His Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys His Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys His Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys His Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys His Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys His Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys His Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys His Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys His Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Gly Ala Cys Tyr

Cys Glu Tyr Cys Leu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Thr Cys Val Gly Cys Tyr

FIGURE 3 (sheet 6 of 68)

Cys Glu Tyr Cys Met Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Met Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 7 of 68)

Cys Glu Tyr Cys Ser Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Val Gly Cys Tyr

Cys Glu Tyr Cys Trp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys Val Asn Gly Thr Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 9 of 68)

Cys Glu Tyr Cys --- Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Tyr Cys --- Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ala Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Thr Cys Val Gly Cys Tyr

Cys Glu Trp Cys Arg Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Arg Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Arg Asn Gly Ala Cys Gly Gly Cys Tyr
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Cys Glu Trp Cys Arg Asn Gly Thr Cys Val Ala Cys Tyr
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Cys Glu Trp Cys Arg Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Ala Cys Val Ala Cys Tyr
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Cys Glu Trp Cys Asn Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Ala Cys Thr Gly Cys Tyr
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Cys Glu Trp Cys Asn Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asn Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Ala Cys Gly Ala Cys Tyr

Cys Glu Trp Cys Asp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Asp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gln Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Glu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Ala Cys Val Gly Cys Tyr

FIGURE 3 (sheet 12 of 68)

Cys Glu Trp Cys Gly Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Gly Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys His Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys His Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys His Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys His Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys His Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys His Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys His Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys His Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys His Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys His Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys His Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys His Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys His Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys His Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys His Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys His Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys His Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys His Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys His Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys His Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys His Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys His Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys His Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys His Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Pro Thr Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 13 of 68)

Cys Glu Trp Cys Ile Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ile Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Leu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Thr Cys Val Gly Cys Tyr

FIGURE 3 (sheet 14 of 68)

Cys Glu Trp Cys Lys Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Lys Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Met Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Met Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Met Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Met Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Met Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Met Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Met Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Met Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Met Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Met Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Met Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Met Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Met Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Met Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Met Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Met Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Met Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Met Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Met Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Met Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Met Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Met Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Met Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Met Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Phe Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Ala Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 15 of 68)

Cys Glu Trp Cys Pro Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Pro Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Ser Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Ala Cys Val Gly Cys Tyr

Cys Glu Trp Cys Thr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Thr Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Trp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 17 of 68)

Cys Glu Trp Cys Val Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Val Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Val Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Val Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Val Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Val Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Val Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Val Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Val Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Val Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Val Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Val Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Val Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Val Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Val Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys Val Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys Val Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Val Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys Val Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys Val Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys Val Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys Val Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys Val Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys Val Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys --- Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys --- Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys --- Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys --- Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys --- Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys --- Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys --- Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys --- Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys --- Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys --- Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys --- Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys --- Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Trp Cys --- Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Trp Cys --- Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Trp Cys --- Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Trp Cys --- Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Trp Cys --- Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Trp Cys --- Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Trp Cys --- Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Trp Cys --- Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Trp Cys --- Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Trp Cys --- Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Trp Cys --- Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Trp Cys --- Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Thr Cys Val Gly Cys Tyr

FIGURE 3 (sheet 18 of 68)

Cys Glu Phe Cys Ala Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ala Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Arg Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Ala Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 19 of 68)

Cys Glu Phe Cys Asn Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asn Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Asp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gln Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Ala Cys Val Gly Cys Tyr

FIGURE 3 (sheet 20 of 68)

Cys Glu Phe Cys Glu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Glu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Gly Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys His Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys His Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys His Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys His Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys His Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys His Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys His Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys His Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys His Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys His Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys His Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys His Asn Pro Thr Cys Gly Ala Cys Tyr

Cys Glu Phe Cys His Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys His Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys His Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys His Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys His Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys His Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys His Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys His Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys His Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys His Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys His Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys His Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ile Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Thr Cys Val Gly Cys Tyr

FIGURE 5 (sheet 22 of 68)

Cys Glu Phe Cys Leu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Leu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Lys Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Met Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Met Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Met Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Met Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Met Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Met Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Met Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Met Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Met Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Met Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Met Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Met Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Met Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Met Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Met Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Met Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Met Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Met Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Met Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Met Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Met Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Met Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Met Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Met Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Ala Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 23 of 68)

Cys Glu Phe Cys Phe Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Phe Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Pro Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Ala Cys Val Gly Cys Tyr

FIGURE 3 (sheet 24 of 68)

Cys Glu Phe Cys Ser Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Ser Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Thr Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Trp Asn Gly Thr Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 25 of 68)

Cys Glu Phe Cys Tyr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Val Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Val Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Val Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Val Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Val Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Val Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Val Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Val Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Val Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Val Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Val Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Val Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Val Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Val Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Val Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys Val Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys Val Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Val Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys Val Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys Val Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys Val Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys Val Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys Val Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys Val Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys --- Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys --- Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys --- Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys --- Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys --- Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys --- Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys --- Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys --- Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys --- Asn Pro Thr Cys Val Gly Cys Tyr

FIGURE 3 (sheet 26 of 68)

Cys Glu Phe Cys --- Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys --- Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys --- Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Phe Cys --- Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Phe Cys --- Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Phe Cys --- Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Phe Cys --- Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Phe Cys --- Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Phe Cys --- Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Phe Cys --- Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Phe Cys --- Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Phe Cys --- Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Phe Cys --- Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Phe Cys --- Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Phe Cys --- Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ala Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Ala Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 27 of 68)

Cys Glu Leu Cys Arg Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Arg Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asn Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Asp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Ala Cys Val Gly Cys Tyr

FIGURE 3 (sheet 28 of 68)

Cys Glu Leu Cys Gln Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gln Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Glu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Pro Thr Cys Gly Ala Cys Tyr

Cys Glu Leu Cys Gly Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Gly Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys His Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys His Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys His Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys His Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys His Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys His Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys His Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys His Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys His Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys His Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys His Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys His Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys His Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys His Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys His Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys His Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys His Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys His Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys His Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys His Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys His Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys His Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys His Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys His Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Thr Cys Val Gly Cys Tyr

Cys Glu Leu Cys Ile Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ile Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Leu Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Lys Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Met Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Met Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Met Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Met Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Met Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Met Asn Pro Ala Cys Gly Ala Cys Tyr

FIGURE 3 (sheet 31 of 68)

Cys Glu Leu Cys Met Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Met Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Met Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Met Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Met Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Met Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Met Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Met Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Met Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Met Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Met Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Met Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Met Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Met Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Met Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Met Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Met Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Met Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Phe Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Ala Cys Val Gly Cys Tyr

Cys Glu Leu Cys Pro Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Pro Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Ser Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Thr Asn Gly Thr Cys Gly Ala Cys Tyr

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Cys Glu Leu Cys Trp Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Trp Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Val Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Val Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Val Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Val Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Val Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Val Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Val Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Val Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Val Asn Pro Thr Cys Val Gly Cys Tyr

FIGURE 3 (sheet 34 of 68)

Cys Glu Leu Cys Val Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Val Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Val Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Val Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Val Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Val Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys Val Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys Val Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Val Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys Val Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys Val Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys Val Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys Val Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys Val Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys Val Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys --- Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys --- Asn Pro Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys --- Asn Pro Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys --- Asn Pro Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys --- Asn Pro Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys --- Asn Pro Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys --- Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys --- Asn Pro Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys --- Asn Pro Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys --- Asn Pro Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys --- Asn Pro Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys --- Asn Pro Thr Cys Gly Ala Cys Tyr
Cys Glu Leu Cys --- Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Glu Leu Cys --- Asn Gly Ala Cys Thr Ala Cys Tyr
Cys Glu Leu Cys --- Asn Gly Ala Cys Val Gly Cys Tyr
Cys Glu Leu Cys --- Asn Gly Ala Cys Val Ala Cys Tyr
Cys Glu Leu Cys --- Asn Gly Ala Cys Gly Gly Cys Tyr
Cys Glu Leu Cys --- Asn Gly Ala Cys Gly Ala Cys Tyr
Cys Glu Leu Cys --- Asn Gly Thr Cys Thr Gly Cys Tyr
Cys Glu Leu Cys --- Asn Gly Thr Cys Thr Ala Cys Tyr
Cys Glu Leu Cys --- Asn Gly Thr Cys Val Gly Cys Tyr
Cys Glu Leu Cys --- Asn Gly Thr Cys Val Ala Cys Tyr
Cys Glu Leu Cys --- Asn Gly Thr Cys Gly Gly Cys Tyr
Cys Glu Leu Cys --- Asn Gly Thr Cys Gly Ala Cys Tyr
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Ala Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Ala Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Ala Asn Gly Ala Cys Gly Ala Cys

FIGURE 3 (sheet 35 of 68)

Cys Glu Tyr Cys Ala Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Ala Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Arg Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Arg Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Arg Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Arg Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Asn Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Asn Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Asn Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Asn Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Val Gly Cys

FIGURE 3 (sheet 36 of 68)

Cys Glu Tyr Cys Asp Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Asp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Asp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Asp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Asp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Gln Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Gln Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Gln Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Gln Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Glu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Glu Asn Pro Thr Cys Gly Ala Cys

FIGURE 3 (sheet 37 of 68)

Cys Glu Tyr Cys Glu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Glu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Glu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Gly Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Gly Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Gly Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Gly Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys His Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys His Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys His Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys His Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys His Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys His Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys His Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys His Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys His Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys His Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys His Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys His Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys His Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys His Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys His Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys His Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys His Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys His Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys His Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys His Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys His Asn Gly Thr Cys Val Gly Cys

FIGURE 3 (sheet 38 of 68)

Cys Glu Tyr Cys His Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys His Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys His Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Ile Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Ile Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Ile Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Ile Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Leu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Leu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Leu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Leu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Lys Asn Pro Ala Cys Gly Ala Cys

FIGURE 3 (sheet 39 of 68)

Cys Glu Tyr Cys Lys Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Lys Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Lys Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Lys Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Met Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Met Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Met Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Met Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Met Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Met Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Met Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Met Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Met Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Met Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Met Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Met Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Met Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Met Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Met Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Met Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Met Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Met Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Met Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Met Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Met Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Met Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Met Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Met Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Phe Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Phe Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Val Gly Cys

FIGURE 3 (sheet 40 of 68)

Cys Glu Tyr Cys Phe Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Phe Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Phe Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Pro Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Pro Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Pro Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Pro Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Ser Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Ser Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Ser Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Ser Asn Gly Thr Cys Gly Ala Cys

FIGURE 3 (sheet 41 of 68)

Cys Glu Tyr Cys Thr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Thr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Thr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Thr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Thr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Trp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Trp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Trp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Trp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Tyr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Val Gly Cys

FIGURE 3 (sheet 42 of 68)

Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Tyr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Tyr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Tyr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Val Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Val Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Val Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys Val Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys Val Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Val Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Val Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Val Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Val Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys Val Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys Val Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Val Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys Val Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys Val Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys Val Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys Val Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys Val Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys Val Asn Gly Ala Cys Gly Ala Cys
Cys Glu Tyr Cys Val Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys Val Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys Val Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys Val Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys Val Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys Val Asn Gly Thr Cys Gly Ala Cys
Cys Glu Tyr Cys --- Asn Pro Ala Cys Thr Gly Cys
Cys Glu Tyr Cys --- Asn Pro Ala Cys Thr Ala Cys
Cys Glu Tyr Cys --- Asn Pro Ala Cys Val Gly Cys
Cys Glu Tyr Cys --- Asn Pro Ala Cys Val Ala Cys
Cys Glu Tyr Cys --- Asn Pro Ala Cys Gly Gly Cys
Cys Glu Tyr Cys --- Asn Pro Ala Cys Gly Ala Cys
Cys Glu Tyr Cys --- Asn Pro Thr Cys Thr Gly Cys
Cys Glu Tyr Cys --- Asn Pro Thr Cys Thr Ala Cys
Cys Glu Tyr Cys --- Asn Pro Thr Cys Val Gly Cys
Cys Glu Tyr Cys --- Asn Pro Thr Cys Val Ala Cys
Cys Glu Tyr Cys --- Asn Pro Thr Cys Gly Gly Cys
Cys Glu Tyr Cys --- Asn Pro Thr Cys Gly Ala Cys
Cys Glu Tyr Cys --- Asn Gly Ala Cys Thr Gly Cys
Cys Glu Tyr Cys --- Asn Gly Ala Cys Thr Ala Cys
Cys Glu Tyr Cys --- Asn Gly Ala Cys Val Gly Cys
Cys Glu Tyr Cys --- Asn Gly Ala Cys Val Ala Cys
Cys Glu Tyr Cys --- Asn Gly Ala Cys Gly Gly Cys
Cys Glu Tyr Cys --- Asn Gly Ala Cys Gly Ala Cys

FIGURE 3 (sheet 43 of 68)

Cys Glu Tyr Cys --- Asn Gly Thr Cys Thr Gly Cys
Cys Glu Tyr Cys --- Asn Gly Thr Cys Thr Ala Cys
Cys Glu Tyr Cys --- Asn Gly Thr Cys Val Gly Cys
Cys Glu Tyr Cys --- Asn Gly Thr Cys Val Ala Cys
Cys Glu Tyr Cys --- Asn Gly Thr Cys Gly Gly Cys
Cys Glu Tyr Cys --- Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Ala Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Ala Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Ala Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Ala Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Ala Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Ala Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Ala Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Ala Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Ala Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Ala Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Ala Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Ala Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Ala Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Ala Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Ala Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Ala Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Ala Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Ala Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Ala Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Ala Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Ala Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Ala Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Ala Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Ala Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Arg Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Arg Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Arg Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Arg Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Arg Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Arg Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Arg Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Arg Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Arg Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Arg Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Arg Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Arg Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Arg Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Arg Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Arg Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Arg Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Arg Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Arg Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Arg Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Arg Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Arg Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Arg Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Arg Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Arg Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Asn Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Asn Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Asn Asn Pro Ala Cys Val Gly Cys

FIGURE 3 (sheet 44 of 68)

Cys Glu Trp Cys Asn Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Asn Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Asn Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Asn Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Asn Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Asn Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Asn Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Asn Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Asn Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Asn Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Asn Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Asn Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Asn Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Asn Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Asn Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Asn Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Asn Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Asn Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Asn Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Asn Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Asn Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Asp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Asp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Asp Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Asp Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Asp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Asp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Asp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Asp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Asp Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Asp Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Asp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Asp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Asp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Asp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Asp Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Asp Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Asp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Asp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Asp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Asp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Asp Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Asp Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Asp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Asp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Gln Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Gln Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Gln Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Gln Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Gln Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Gln Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Gln Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Gln Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Gln Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Gln Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Gln Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Gln Asn Pro Thr Cys Gly Ala Cys

FIGURE 3 (sheet 45 of 68)

Cys Glu Trp Cys Gln Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Gln Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Gln Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Gln Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Gln Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Gln Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Gln Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Gln Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Gln Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Gln Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Gln Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Gln Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Glu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Glu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Glu Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Glu Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Glu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Glu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Glu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Glu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Glu Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Glu Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Glu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Glu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Glu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Glu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Glu Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Glu Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Glu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Glu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Glu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Glu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Glu Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Glu Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Glu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Glu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Gly Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Gly Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Gly Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Gly Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Gly Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Gly Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Gly Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Gly Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Gly Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Gly Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Gly Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Gly Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Gly Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Gly Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Gly Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Gly Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Gly Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Gly Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Gly Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Gly Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Gly Asn Gly Thr Cys Val Gly Cys

FIGURE 3 (sheet 46 of 68)

Cys Glu Trp Cys Gly Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Gly Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Gly Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys His Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys His Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys His Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys His Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys His Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys His Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys His Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys His Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys His Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys His Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys His Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys His Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys His Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys His Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys His Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys His Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys His Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys His Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys His Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys His Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys His Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys His Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys His Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys His Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Ile Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Ile Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Ile Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Ile Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Ile Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Ile Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Ile Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Ile Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Ile Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Ile Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Ile Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Ile Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Ile Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Ile Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Ile Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Ile Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Ile Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Ile Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Ile Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Ile Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Ile Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Ile Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Ile Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Ile Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Leu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Leu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Leu Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Leu Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Leu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Leu Asn Pro Ala Cys Gly Ala Cys

FIGURE 3 (sheet 47 of 68)

Cys Glu Trp Cys Leu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Leu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Leu Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Leu Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Leu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Leu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Leu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Leu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Leu Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Leu Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Leu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Leu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Leu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Leu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Leu Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Leu Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Leu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Leu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Lys Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Lys Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Lys Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Lys Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Lys Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Lys Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Lys Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Lys Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Lys Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Lys Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Lys Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Lys Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Lys Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Lys Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Lys Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Lys Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Lys Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Lys Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Lys Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Lys Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Lys Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Lys Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Lys Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Lys Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Met Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Met Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Met Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Met Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Met Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Met Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Met Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Met Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Met Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Met Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Met Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Met Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Met Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Met Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Met Asn Gly Ala Cys Val Gly Cys

FIGURE 3 (sheet 48 of 68)

Cys Glu Trp Cys Met Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Met Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Met Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Met Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Met Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Met Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Met Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Met Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Met Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Phe Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Phe Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Phe Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Phe Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Phe Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Phe Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Phe Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Phe Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Phe Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Phe Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Phe Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Phe Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Phe Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Phe Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Phe Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Phe Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Phe Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Phe Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Phe Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Phe Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Phe Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Phe Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Phe Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Phe Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Pro Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Pro Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Pro Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Pro Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Pro Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Pro Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Pro Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Pro Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Pro Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Pro Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Pro Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Pro Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Pro Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Pro Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Pro Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Pro Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Pro Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Pro Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Pro Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Pro Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Pro Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Pro Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Pro Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Pro Asn Gly Thr Cys Gly Ala Cys

FIGURE 3 (sheet 49 of 68)

Cys Glu Trp Cys Ser Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Ser Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Ser Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Ser Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Ser Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Ser Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Ser Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Ser Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Ser Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Ser Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Ser Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Ser Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Ser Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Ser Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Ser Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Ser Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Ser Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Ser Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Ser Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Ser Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Ser Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Ser Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Ser Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Ser Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Thr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Thr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Thr Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Thr Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Thr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Thr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Thr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Thr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Thr Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Thr Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Thr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Thr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Thr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Thr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Thr Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Thr Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Thr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Thr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Thr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Thr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Thr Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Thr Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Thr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Thr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Trp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Trp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Trp Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Trp Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Trp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Trp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Trp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Trp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Trp Asn Pro Thr Cys Val Gly Cys

FIGURE 3 (sheet 50 of 68)

Cys Glu Trp Cys Trp Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Trp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Trp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Trp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Trp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Trp Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Trp Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Trp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Trp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Trp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Trp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Trp Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Trp Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Trp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Trp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Tyr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Tyr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Tyr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Tyr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys Val Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys Val Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys Val Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys Val Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys Val Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys Val Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys Val Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys Val Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys Val Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys Val Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys Val Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys Val Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys Val Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys Val Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys Val Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys Val Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys Val Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys Val Asn Gly Ala Cys Gly Ala Cys

FIGURE 3 (sheet 51 of 68)

Cys Glu Trp Cys Val Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys Val Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys Val Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys Val Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys Val Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys Val Asn Gly Thr Cys Gly Ala Cys
Cys Glu Trp Cys --- Asn Pro Ala Cys Thr Gly Cys
Cys Glu Trp Cys --- Asn Pro Ala Cys Thr Ala Cys
Cys Glu Trp Cys --- Asn Pro Ala Cys Val Gly Cys
Cys Glu Trp Cys --- Asn Pro Ala Cys Val Ala Cys
Cys Glu Trp Cys --- Asn Pro Ala Cys Gly Gly Cys
Cys Glu Trp Cys --- Asn Pro Ala Cys Gly Ala Cys
Cys Glu Trp Cys --- Asn Pro Thr Cys Thr Gly Cys
Cys Glu Trp Cys --- Asn Pro Thr Cys Thr Ala Cys
Cys Glu Trp Cys --- Asn Pro Thr Cys Val Gly Cys
Cys Glu Trp Cys --- Asn Pro Thr Cys Val Ala Cys
Cys Glu Trp Cys --- Asn Pro Thr Cys Gly Gly Cys
Cys Glu Trp Cys --- Asn Pro Thr Cys Gly Ala Cys
Cys Glu Trp Cys --- Asn Gly Ala Cys Thr Gly Cys
Cys Glu Trp Cys --- Asn Gly Ala Cys Thr Ala Cys
Cys Glu Trp Cys --- Asn Gly Ala Cys Val Gly Cys
Cys Glu Trp Cys --- Asn Gly Ala Cys Val Ala Cys
Cys Glu Trp Cys --- Asn Gly Ala Cys Gly Gly Cys
Cys Glu Trp Cys --- Asn Gly Ala Cys Gly Ala Cys
Cys Glu Trp Cys --- Asn Gly Thr Cys Thr Gly Cys
Cys Glu Trp Cys --- Asn Gly Thr Cys Thr Ala Cys
Cys Glu Trp Cys --- Asn Gly Thr Cys Val Gly Cys
Cys Glu Trp Cys --- Asn Gly Thr Cys Val Ala Cys
Cys Glu Trp Cys --- Asn Gly Thr Cys Gly Gly Cys
Cys Glu Trp Cys --- Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Ala Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Ala Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Ala Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Ala Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Ala Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Ala Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Ala Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Ala Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Ala Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Ala Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Ala Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Ala Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Ala Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Ala Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Ala Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Ala Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Ala Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Ala Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Ala Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Ala Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Ala Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Ala Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Ala Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Ala Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Arg Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Arg Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Arg Asn Pro Ala Cys Val Gly Cys

FIGURE 3 (sheet 52 of 68)

Cys Glu Phe Cys Arg Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Arg Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Arg Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Arg Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Arg Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Arg Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Arg Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Arg Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Arg Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Arg Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Arg Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Arg Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Arg Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Arg Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Arg Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Arg Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Arg Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Arg Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Arg Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Arg Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Arg Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Asn Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Asn Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Asn Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Asn Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Asn Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Asn Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Asn Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Asn Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Asn Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Asn Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Asn Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Asn Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Asn Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Asn Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Asn Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Asn Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Asn Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Asn Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Asn Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Asn Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Asn Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Asn Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Asn Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Asn Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Asp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Asp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Asp Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Asp Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Asp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Asp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Asp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Asp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Asp Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Asp Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Asp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Asp Asn Pro Thr Cys Gly Ala Cys

FIGURE 3 (sheet 53 of 68)

Cys Glu Phe Cys Asp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Asp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Asp Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Asp Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Asp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Asp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Asp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Asp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Asp Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Asp Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Asp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Asp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Gln Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Gln Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Gln Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Gln Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Gln Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Gln Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Gln Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Gln Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Gln Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Gln Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Gln Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Gln Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Gln Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Gln Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Gln Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Gln Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Gln Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Gln Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Gln Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Gln Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Gln Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Gln Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Gln Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Gln Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Glu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Glu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Glu Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Glu Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Glu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Glu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Glu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Glu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Glu Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Glu Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Glu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Glu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Glu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Glu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Glu Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Glu Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Glu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Glu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Glu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Glu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Glu Asn Gly Thr Cys Val Gly Cys

FIGURE 3 (sheet 54 of 68)

Cys Glu Phe Cys Glu Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Glu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Glu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Gly Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Gly Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Gly Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Gly Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Gly Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Gly Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Gly Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Gly Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Gly Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Gly Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Gly Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Gly Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Gly Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Gly Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Gly Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Gly Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Gly Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Gly Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Gly Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Gly Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Gly Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Gly Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Gly Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Gly Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys His Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys His Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys His Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys His Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys His Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys His Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys His Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys His Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys His Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys His Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys His Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys His Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys His Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys His Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys His Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys His Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys His Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys His Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys His Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys His Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys His Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys His Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys His Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys His Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Ile Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Ile Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Ile Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Ile Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Ile Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Ile Asn Pro Ala Cys Gly Ala Cys

FIGURE 3 (sheet 55 of 68)

Cys Glu Phe Cys Ile Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Ile Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Ile Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Ile Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Ile Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Ile Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Ile Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Ile Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Ile Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Ile Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Ile Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Ile Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Ile Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Ile Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Ile Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Ile Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Ile Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Ile Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Leu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Leu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Leu Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Leu Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Leu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Leu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Leu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Leu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Leu Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Leu Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Leu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Leu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Leu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Leu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Leu Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Leu Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Leu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Leu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Leu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Leu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Leu Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Leu Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Leu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Leu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Lys Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Lys Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Lys Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Lys Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Lys Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Lys Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Lys Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Lys Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Lys Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Lys Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Lys Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Lys Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Lys Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Lys Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Lys Asn Gly Ala Cys Val Gly Cys

FIGURE 3 (sheet 56 of 68)

Cys Glu Phe Cys Lys Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Lys Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Lys Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Lys Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Lys Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Lys Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Lys Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Lys Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Lys Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Met Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Met Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Met Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Met Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Met Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Met Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Met Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Met Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Met Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Met Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Met Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Met Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Met Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Met Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Met Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Met Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Met Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Met Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Met Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Met Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Met Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Met Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Met Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Met Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Phe Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Phe Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Phe Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Phe Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Phe Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Phe Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Phe Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Phe Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Phe Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Phe Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Phe Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Phe Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Phe Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Phe Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Phe Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Phe Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Phe Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Phe Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Phe Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Phe Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Phe Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Phe Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Phe Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Phe Asn Gly Thr Cys Gly Ala Cys

FIGURE 3 (sheet 57 of 68)

Cys Glu Phe Cys Pro Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Pro Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Pro Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Pro Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Pro Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Pro Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Pro Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Pro Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Pro Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Pro Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Pro Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Pro Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Pro Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Pro Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Pro Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Pro Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Pro Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Pro Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Pro Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Pro Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Pro Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Pro Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Pro Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Pro Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Ser Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Ser Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Ser Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Ser Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Ser Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Ser Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Ser Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Ser Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Ser Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Ser Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Ser Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Ser Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Ser Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Ser Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Ser Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Ser Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Ser Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Ser Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Ser Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Ser Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Ser Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Ser Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Ser Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Ser Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Thr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Thr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Thr Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Thr Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Thr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Thr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Thr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Thr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Thr Asn Pro Thr Cys Val Gly Cys

FIGURE 3 (sheet 58 of 68)

Cys Glu Phe Cys Thr Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Thr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Thr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Thr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Thr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Thr Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Thr Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Thr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Thr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Thr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Thr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Thr Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Thr Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Thr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Thr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Trp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Trp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Trp Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Trp Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Trp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Trp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Trp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Trp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Trp Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Trp Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Trp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Trp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Trp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Trp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Trp Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Trp Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Trp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Trp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Trp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Trp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Trp Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Trp Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Trp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Trp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Tyr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Tyr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Tyr Asn Gly Ala Cys Gly Ala Cys

FIGURE 3 (sheet 59 of 68)

Cys Glu Phe Cys Tyr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Tyr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys Val Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys Val Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys Val Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys Val Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys Val Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys Val Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys Val Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys Val Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys Val Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys Val Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys Val Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys Val Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys Val Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys Val Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys Val Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys Val Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys Val Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys Val Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys Val Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys Val Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys Val Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys Val Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys Val Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys Val Asn Gly Thr Cys Gly Ala Cys
Cys Glu Phe Cys --- Asn Pro Ala Cys Thr Gly Cys
Cys Glu Phe Cys --- Asn Pro Ala Cys Thr Ala Cys
Cys Glu Phe Cys --- Asn Pro Ala Cys Val Gly Cys
Cys Glu Phe Cys --- Asn Pro Ala Cys Val Ala Cys
Cys Glu Phe Cys --- Asn Pro Ala Cys Gly Gly Cys
Cys Glu Phe Cys --- Asn Pro Ala Cys Gly Ala Cys
Cys Glu Phe Cys --- Asn Pro Thr Cys Thr Gly Cys
Cys Glu Phe Cys --- Asn Pro Thr Cys Thr Ala Cys
Cys Glu Phe Cys --- Asn Pro Thr Cys Val Gly Cys
Cys Glu Phe Cys --- Asn Pro Thr Cys Val Ala Cys
Cys Glu Phe Cys --- Asn Pro Thr Cys Gly Gly Cys
Cys Glu Phe Cys --- Asn Pro Thr Cys Gly Ala Cys
Cys Glu Phe Cys --- Asn Gly Ala Cys Thr Gly Cys
Cys Glu Phe Cys --- Asn Gly Ala Cys Thr Ala Cys
Cys Glu Phe Cys --- Asn Gly Ala Cys Val Gly Cys
Cys Glu Phe Cys --- Asn Gly Ala Cys Val Ala Cys
Cys Glu Phe Cys --- Asn Gly Ala Cys Gly Gly Cys
Cys Glu Phe Cys --- Asn Gly Ala Cys Gly Ala Cys
Cys Glu Phe Cys --- Asn Gly Thr Cys Thr Gly Cys
Cys Glu Phe Cys --- Asn Gly Thr Cys Thr Ala Cys
Cys Glu Phe Cys --- Asn Gly Thr Cys Val Gly Cys
Cys Glu Phe Cys --- Asn Gly Thr Cys Val Ala Cys
Cys Glu Phe Cys --- Asn Gly Thr Cys Gly Gly Cys
Cys Glu Phe Cys --- Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Ala Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Ala Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Ala Asn Pro Ala Cys Val Gly Cys

FIGURE 3 (sheet 60 of 68)

Cys Glu Leu Cys Ala Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Ala Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Ala Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Ala Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Ala Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Ala Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Ala Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Ala Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Ala Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Ala Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Ala Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Ala Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Ala Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Ala Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Ala Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Ala Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Ala Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Ala Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Ala Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Ala Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Ala Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Arg Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Arg Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Arg Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Arg Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Arg Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Arg Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Arg Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Arg Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Arg Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Arg Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Arg Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Arg Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Arg Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Arg Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Arg Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Arg Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Arg Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Arg Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Arg Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Arg Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Arg Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Arg Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Arg Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Arg Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Asn Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Asn Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Asn Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Asn Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Asn Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Asn Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Asn Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Asn Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Asn Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Asn Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Asn Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Asn Asn Pro Thr Cys Gly Ala Cys

FIGURE 3 (sheet 61 of 68)

Cys Glu Leu Cys Asn Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Asn Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Asn Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Asn Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Asn Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Asn Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Asn Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Asn Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Asn Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Asn Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Asn Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Asn Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Asp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Asp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Asp Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Asp Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Asp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Asp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Asp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Asp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Asp Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Asp Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Asp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Asp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Asp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Asp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Asp Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Asp Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Asp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Asp Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Asp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Asp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Asp Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Asp Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Asp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Asp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Gln Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Gln Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Gln Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Gln Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Gln Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Gln Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Gln Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Gln Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Gln Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Gln Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Gln Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Gln Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Gln Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Gln Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Gln Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Gln Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Gln Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Gln Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Gln Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Gln Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Gln Asn Gly Thr Cys Val Gly Cys

FIGURE 3 (sheet 62 of 68)

Cys Glu Leu Cys Gln Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Gln Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Gln Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Glu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Glu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Glu Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Glu Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Glu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Glu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Glu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Glu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Glu Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Glu Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Glu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Glu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Glu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Glu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Glu Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Glu Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Glu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Glu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Glu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Glu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Glu Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Glu Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Glu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Glu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Gly Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Gly Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Gly Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Gly Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Gly Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Gly Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Gly Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Gly Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Gly Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Gly Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Gly Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Gly Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Gly Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Gly Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Gly Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Gly Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Gly Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Gly Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Gly Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Gly Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Gly Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Gly Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Gly Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Gly Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys His Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys His Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys His Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys His Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys His Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys His Asn Pro Ala Cys Gly Ala Cys

FIGURE 3 (sheet 63 of 68)

Cys Glu Leu Cys His Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys His Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys His Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys His Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys His Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys His Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys His Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys His Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys His Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys His Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys His Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys His Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys His Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys His Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys His Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys His Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys His Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys His Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Ile Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Ile Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Ile Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Ile Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Ile Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Ile Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Ile Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Ile Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Ile Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Ile Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Ile Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Ile Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Ile Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Ile Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Ile Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Ile Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Ile Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Ile Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Ile Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Ile Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Ile Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Ile Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Ile Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Ile Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Leu Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Leu Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Leu Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Leu Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Leu Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Leu Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Leu Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Leu Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Leu Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Leu Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Leu Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Leu Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Leu Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Leu Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Leu Asn Gly Ala Cys Val Gly Cys

FIGURE 3 (sheet 64 of 68)

Cys Glu Leu Cys Leu Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Leu Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Leu Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Leu Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Leu Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Leu Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Leu Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Leu Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Leu Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Lys Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Lys Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Lys Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Lys Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Lys Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Lys Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Lys Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Lys Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Lys Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Lys Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Lys Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Lys Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Lys Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Lys Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Lys Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Lys Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Lys Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Lys Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Lys Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Lys Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Lys Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Lys Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Lys Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Lys Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Met Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Met Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Met Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Met Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Met Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Met Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Met Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Met Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Met Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Met Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Met Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Met Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Met Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Met Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Met Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Met Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Met Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Met Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Met Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Met Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Met Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Met Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Met Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Met Asn Gly Thr Cys Gly Ala Cys

FIGURE 3 (sheet 65 of 68)

Cys Glu Leu Cys Phe Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Phe Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Phe Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Phe Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Phe Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Phe Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Phe Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Phe Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Phe Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Phe Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Phe Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Phe Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Phe Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Phe Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Phe Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Phe Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Phe Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Phe Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Phe Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Phe Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Phe Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Phe Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Phe Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Phe Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Pro Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Pro Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Pro Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Pro Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Pro Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Pro Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Pro Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Pro Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Pro Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Pro Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Pro Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Pro Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Pro Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Pro Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Pro Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Pro Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Pro Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Pro Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Pro Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Pro Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Pro Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Pro Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Pro Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Pro Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Ser Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Ser Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Ser Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Ser Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Ser Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Ser Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Ser Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Ser Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Ser Asn Pro Thr Cys Val Gly Cys

FIGURE 3 (sheet 66 of 168)

Cys Glu Leu Cys Ser Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Ser Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Ser Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Ser Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Ser Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Ser Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Ser Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Ser Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Ser Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Ser Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Ser Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Ser Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Ser Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Ser Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Ser Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Thr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Thr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Thr Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Thr Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Thr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Thr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Thr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Thr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Thr Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Thr Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Thr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Thr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Thr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Thr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Thr Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Thr Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Thr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Thr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Thr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Thr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Thr Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Thr Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Thr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Thr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Trp Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Trp Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Trp Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Trp Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Trp Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Trp Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Trp Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Trp Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Trp Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Trp Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Trp Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Trp Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Trp Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Trp Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Trp Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Trp Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Trp Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Trp Asn Gly Ala Cys Gly Ala Cys

FIGURE 3 (sheet 67 of 68)

Cys Glu Leu Cys Trp Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Trp Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Trp Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Trp Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Trp Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Trp Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Tyr Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Tyr Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Tyr Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Tyr Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys Val Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys Val Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys Val Asn Pro Ala Cys Val Gly Cys
Cys Glu Leu Cys Val Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys Val Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys Val Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys Val Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys Val Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys Val Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys Val Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys Val Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys Val Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys Val Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys Val Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys Val Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys Val Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys Val Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys Val Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys Val Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys Val Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys Val Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys Val Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys Val Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys Val Asn Gly Thr Cys Gly Ala Cys
Cys Glu Leu Cys --- Asn Pro Ala Cys Thr Gly Cys
Cys Glu Leu Cys --- Asn Pro Ala Cys Thr Ala Cys
Cys Glu Leu Cys --- Asn Pro Ala Cys Val Gly Cys

FIGURE 3 (sheet 68 of 68)

Cys Glu Leu Cys --- Asn Pro Ala Cys Val Ala Cys
Cys Glu Leu Cys --- Asn Pro Ala Cys Gly Gly Cys
Cys Glu Leu Cys --- Asn Pro Ala Cys Gly Ala Cys
Cys Glu Leu Cys --- Asn Pro Thr Cys Thr Gly Cys
Cys Glu Leu Cys --- Asn Pro Thr Cys Thr Ala Cys
Cys Glu Leu Cys --- Asn Pro Thr Cys Val Gly Cys
Cys Glu Leu Cys --- Asn Pro Thr Cys Val Ala Cys
Cys Glu Leu Cys --- Asn Pro Thr Cys Gly Gly Cys
Cys Glu Leu Cys --- Asn Pro Thr Cys Gly Ala Cys
Cys Glu Leu Cys --- Asn Gly Ala Cys Thr Gly Cys
Cys Glu Leu Cys --- Asn Gly Ala Cys Thr Ala Cys
Cys Glu Leu Cys --- Asn Gly Ala Cys Val Gly Cys
Cys Glu Leu Cys --- Asn Gly Ala Cys Val Ala Cys
Cys Glu Leu Cys --- Asn Gly Ala Cys Gly Gly Cys
Cys Glu Leu Cys --- Asn Gly Ala Cys Gly Ala Cys
Cys Glu Leu Cys --- Asn Gly Thr Cys Thr Gly Cys
Cys Glu Leu Cys --- Asn Gly Thr Cys Thr Ala Cys
Cys Glu Leu Cys --- Asn Gly Thr Cys Val Gly Cys
Cys Glu Leu Cys --- Asn Gly Thr Cys Val Ala Cys
Cys Glu Leu Cys --- Asn Gly Thr Cys Gly Gly Cys
Cys Glu Leu Cys --- Asn Gly Thr Cys Gly Ala Cys

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(54) Title: METHODS AND COMPOSITIONS FOR THE TREATMENT OF GASTROINTESTINAL DISORDERS

(57) Abstract: The present invention features compositions and related methods for treating IBS and other gastrointestinal disorders and conditions (e.g., gastrointestinal motility disorders, functional gastrointestinal disorders, gastroesophageal reflux disease (GERD), duodenogastric reflux, Crohn's disease, ulcerative colitis, Inflammatory bowel disease, functional heartburn, dyspepsia (including functional dyspepsia or nonulcer dyspepsia), gastroparesis, chronic intestinal pseudo-obstruction (or colonic pseudo-obstruction), and disorders and conditions associated with constipation, e.g., constipation associated with use of opiate pain killers, post-surgical constipation (post-operative ileus), and constipation associated with neuropathic disorders as well as other conditions and disorders using peptides and other agents that activate the guanylate cyclase C (GC-C) receptor.

WO 2005/087797 A1

Methods and Compositions for the Treatment of Gastrointestinal Disorders

CLAIM OF PRIORITY

This application is a continuation in part of U.S. Utility Patent Application Serial No.11/054,071, filed February 8, 2005, which is a continuation in part U.S. Utility Patent Application Serial No.10/899,806, filed July 27, 2004, which is a continuation in part of U.S. Utility Patent Application Serial No.10/845,895, filed May 14, 2004, which is a continuation in part of U.S. Utility Patent Application Serial No. 10/796,719, filed March 9, 2004, which is a continuation in part of U.S. Utility Patent Application Serial No. 10/766,735, filed January 28, 2004, which claims priority under 35 USC §119(e) to U.S. Provisional Patent Application Serial No. 60/443,098, filed on January 28, 2003; U.S. Provisional Patent Application Serial No. 60/471,288, filed on May 15, 2003 and U.S. Provisional Patent Application Serial No. 60/519,460, filed on November 12, 2003, the entire contents of which are hereby incorporated by reference.

TECHNICAL FIELD

This invention relates to methods and compositions for treating various disorders, including gastrointestinal disorders, obesity, congestive heart failure and benign prostatic hyperplasia.

BACKGROUND

Irritable bowel syndrome (IBS) is a common chronic disorder of the intestine that affects 20 to 60 million individuals in the US alone (Lehman Brothers, Global Healthcare-Irritable bowel syndrome industry update, September 1999). IBS is the most common disorder diagnosed by gastroenterologists (28% of patients examined) and accounts for 12% of visits to primary care physicians (Camilleri 2001, Gastroenterology 120:652-668). In the US, the economic impact of IBS is estimated at $25 billion annually, through direct costs of health care use and indirect costs of absenteeism from work (Talley 1995, Gastroenterology 109:1736-1741). Patients with IBS have three times more absenteeism from work and report a reduced quality of life.

Sufferers may be unable or unwilling to attend social events, maintain employment, or travel even short distances (Drossman 1993, Dig Dis Sci 38:1569-1580). There is a tremendous unmet medical need in this population since few prescription options exist to treat IBS.

Patients with IBS suffer from abdominal pain and a disturbed bowel pattern. Three subgroups of IBS patients have been defined based on the predominant bowel habit: constipation-predominant (c-IBS), diarrhea-predominant (d-IBS) or alternating between the two (a-IBS). Estimates of individuals who suffer from c-IBS range from 20-50% of the IBS patients with 30% frequently cited. In contrast to the other two subgroups that have a similar gender ratio, c-IBS is more common in women (ratio of 3:1) (Talley et al. 1995, Am J Epidemiol 142:76-83).

The definition and diagnostic criteria for IBS have been formalized in the "Rome Criteria" (Drossman et al. 1999, Gut 45:Suppl II: 1-81), which are well accepted in clinical practice. However, the complexity of symptoms has not been explained by anatomical abnormalities or metabolic changes. This has led to the classification of IBS as a functional GI disorder, which is diagnosed on the basis of the Rome criteria and limited evaluation to exclude organic disease (Ringel et al. 2001, Annu Rev Med 52: 319-338). IBS is considered to be a "biopsychosocial" disorder resulting from a combination of three interacting mechanisms: altered bowel motility, an increased sensitivity of the intestine or colon to pain stimuli (visceral sensitivity) and psychosocial factors (Camilleri 2001, Gastroenterology 120:652-668). Recently, there has been increasing evidence for a role of inflammation in etiology of IBS. Reports indicate that subsets of IBS patients have small but significant increases in colonic inflammatory and mast cells, increased inducible nitric oxide (NO) and synthase (iNOS) and altered expression of inflammatory cytokines (reviewed by Talley 2000, Medscape Coverage of DDW week).

SUMMARY

The present invention features compositions and related methods for treating IBS and other gastrointestinal disorders and conditions (e.g., gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric

reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein. The compositions feature peptides that activate the guanylate cyclase C (GC-C) receptor.

The present invention also features compositions and related methods for treating obesity, congestive heart failure and benign prostatic hyperplasia (BPH).

Without being bound by any particular theory, in the case of IBS and other gastrointestinal disorders the peptides are useful because they may increase gastrointestinal motility.

Without being bound by any particular theory, in the case of IBS and other gastrointestinal disorders the peptides are useful, in part, because they may decrease inflammation.

Without being bound by any particular theory, in the case of IBS and other gastrointestinal disorders the peptides are also useful because they may decrease gastrointestinal pain or visceral pain.

The invention features pharmaceutical compositions comprising certain peptides that are capable of activating the guanylate-cyclase C (GC-C) receptor. Also within the invention are pharmaceutical compositions comprising a peptide or GC-C agonist of the invention and one or more additional therapeutic agents including, without limitation, the agents described herein. The other agents can be administered with the peptides of the invention (simultaneously or sequentially). They can also be linked to a peptide of the invention to create therapeutic conjugates.

The invention includes methods for treating various gastrointestinal disorders by administering a peptide that acts as a partial or complete agonist of the GC-C receptor. The peptide includes at least six cysteines that can form three disulfide bonds. In certain embodiments the disulfide bonds are replaced by other covalent cross-links and in some cases the cysteines are substituted by other residues to provide for alternative covalent cross-links. The peptides may also include at least one trypsin or chymotrypsin cleavage site and/or an amino or carboxy-terminal analgesic peptide or small molecule, e.g., AspPhe or some other analgesic peptide. When present within the peptide, the analgesic peptide or small molecule may be preceded by a chymotrypsin or trypsin cleavage site that allows release of the analgesic peptide or small molecule. The peptides and methods of the invention are also useful for treating pain and inflammation associated with various disorders, including gastrointestinal disorders. Certain peptides include a functional chymotrypsin or trypsin cleavage site located so as to allow inactivation of the peptide upon cleavage. Certain peptides having a functional cleavage site undergo cleavage and gradual inactivation in the digestive tract, and this is desirable in some circumstances. In certain peptides, a functional chymotrypsin site is altered, increasing the stability of the peptide *in vivo*.

The invention includes methods for treating other disorders such as congestive heart failure and benign prostatic hyperplasia by administering a peptide or small molecule (parenterally or orally) that acts as an agonist of the GC-C receptor. Such agents can be used in combination with natriuretic peptides (e.g., atrial natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide), a diuretic, or an inhibitor of angiotensin converting enzyme.

The invention features methods and compositions for increasing intestinal motility. Intestinal motility involves spontaneous coordinated dissentions and contractions of the stomach, intestines, colon and rectum to move food through the gastrointestinal tract during the digestive process.

In certain embodiments the peptides include either one or two or more contiguous negatively charged amino acids (e.g., Asp or Glu) or one or two or more contiguous positively charged

residues (e.g., Lys or Arg) or one or two or more contiguous positively or negatively charged amino acids at the carboxy terminus. In these embodiments all of the flanking amino acids at the carboxy terminus are either positively or negatively charged. In other embodiments the carboxy terminal charged amino acids are preceded by a Leu. For example, any of the following amino acid sequences can be added to the carboxy terminus of the peptide: Asp; Asp Lys; Lys Lys Lys Lys Lys Lys; Asp Lys Lys Lys Lys Lys Lys; Leu Lys Lys; and Leu Asp. It is also possible to simply add Leu at the carboxy terminus.

In a first aspect, the invention features a peptide comprising, consisting of, or consisting essentially of the amino acid sequence (I):

$Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}$
$Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (SEQ ID NO: 1)

In some embodiments $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ is Asn Ser Ser Asn Tyr or is missing or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4$ is missing.

In certain embodiments Xaa_8, Xaa_9, Xaa_{12}, Xaa_{14}, Xaa_{16}, Xaa_{17}, and Xaa_{19} can be any amino acid. In certain embodiments Xaa_8, Xaa_9, Xaa_{12}, Xaa_{14}, Xaa_{16}, Xaa_{17}, and Xaa_{19} can be any natural or non-natural amino acid or amino acid analog.

In certain embodiments, the peptide does not include the sequence of E. coli ST peptide. In other embodiment, the peptide does not include the sequence of any of the peptides in Table 1, below.

In certain embodiments Xaa_5 is Asn, Trp, Tyr, Asp, or Phe. In other embodiments, Xaa_5 can also be Thr or Ile. In other embodiments Xaa_5 is Tyr, Asp or Trp. In certain embodiments Xaa_5 is Asn, Trp, Tyr, Asp, Ile, Thr or Phe. In certain embodiments Xaa_5 is Asn.

In some embodiments Xaa_8 is Glu, Asp, Gln, Gly or Pro. In other embodiments Xaa_8 is Glu. In other embodiments Xaa_8 is Glu or Asp. In others it is Asn, Glu, or Asp. In others it is Glu, His, Lys, Gln, Asn, or Asp. In others it is Glu, His, Gln, Asn, or Asp. In others it is Glu, Asn, His, Gln, Lys, Asp or Ser. In still others it is Pro. In certain embodiments it is any natural or non-natural amino acid or amino acid analog.

In some embodiments Xaa_9 is Leu, Ile, Val, Ala, Lys, Arg, Trp, Tyr or Phe. In some embodiments Xaa_9 is Leu, Ile, Val, Lys, Arg, Trp, Tyr or Phe. In others it is Leu, Ile, Val, Trp, Tyr or Phe. In others it is Leu, Ile or Val. In others it is Trp, Tyr or Phe. In others it is Leu, Ile, Lys, Arg, Trp, Tyr, or Phe. In others it is Leu, Val, Ile, or Met. In others it is Leu or Phe. In others it is Leu, Phe, or Tyr. In others it is Tyr, Phe or His. In others it is Phe, His, Trp, or Tyr. In certain embodiments, Xaa_9 is not Leu. In others it is Tyr. In other embodiments it is any natural or non-natural aromatic amino acid or amino acid analog. In certain embodiments it is any natural or non-natural amino acid or amino acid analog.

In certain embodiments, Xaa_{12} is Asn, Tyr, Asp or Ala. In others it is Asn. In others it is Asn, Met, Arg, Lys, His, or Gln. In others it is Asn, Lys, His, or Gln. In others it is Asn, Asp, Glu or Gln. In others it is Asn, Thr, Ser, Arg, Lys, Gln, or His. In others it is Asn, Ser, or His. In certain embodiments it is any natural or non-natural amino acid or amino acid analog.

In certain embodiments, Xaa_{13} is is Ala, Pro or Gly. In others it is Pro or Gly. In others it is Pro and in still others it is Gly.

In certain embodiments, Xaa_{14} is Ala, Leu, Ser, Gly, Val, Glu, Gln, Ile, Leu, Thr, Lys, Arg, or Asp. In others it is Ala or Gly. In others it is Val or Ala. In others it is Ala or Thr. In others it is Ala. In others it is Val, Gln, Asn, Glu, Asp, Thr, or Ala. In others it is Gly, Cys or Ser. In still others it is Thr. In certain embodiments it is any natural or non-natural amino acid or amino acid analog.

In certain embodiments Xaa_{16} is Thr, Ala, Asn, Lys, Arg, Trp, Gly or Val. In others it is Thr, Ala, Asn, Lys, Arg or Trp. In others it is Thr, Ala, Lys, Arg or Trp. In certain embodiments it is Thr, Ala or Trp. In others it is Thr. In certain embodiments it is Trp, Tyr or Phe. In certain embodiments it is Thr or Ala. In certain embodiments it is Val. In certain embodiments it is Gly. In others it is Thr, Ser, Met or Val. In others it is Val, Ala, or Thr. In others it is Ile, Val, Lys, Asn, Glu, Asp, or Thr. In certain embodiments it is any natural or non-natural amino acid or amino acid analog. In certain embodiments it is any natural or non-natural non-aromatic amino acid or amino acid analog.

In certain embodiments Xaa_{17} is Gly, Pro or Ala. In certain embodiments it is Gly. In certain embodiments it is Ala. In others it is Gly or Ala. In others it is Gly, Asn, Ser or Ala. In others it is Asn, Glu, Asp, Thr, Ala, Ser, or Gly. In others it is Asp, Ala, Ser, or Gly. In certain embodiments it is any natural or non-natural amino acid or amino acid analog.

In certain embodiments Xaa_{19} is Trp, Tyr, Phe, Asn, Ile, Val, His, Leu, or Arg. In certain embodiments it is Trp, Tyr, Asn or Leu. In certain embodiments it is Trp, Tyr or Phe. In others it is Tyr, Phe or His. In others it is Tyr or Trp. In others it is Tyr. In certain embodiments it is Leu, Ile or Val. In certain embodiments it is His. In certain embodiments it is Trp, Tyr, Phe, Asn, Ile, Val, His or Leu. In certain embodiments it is Trp, Tyr, Phe or Leu. In certain embodiments it is Tyr or Leu. In certain embodiments it is Lys or Arg. In certain embodiments it is any amino acid other than Pro, Arg, Lys, Asp or Glu. In certain embodiments it is any amino acid other than Pro. In certain embodiments it is any natural or non-natural amino acid or amino acid analog. In certain embodiments it is missing.

In certain embodiments Xaa_{20} is Asp or Asn. In certain embodiments Xaa_{20} Xaa_{21} is AspPhe or is missing or Xaa_{20} is Asn or Glu and Xaa_{21} is missing or Xaa_{19} Xaa_{20} Xaa_{21} is missing.

In certain embodiments, the invention features, a purified polypeptide comprising the amino acid sequence (II):

$Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}$
$Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$

wherein $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ is Asn Ser Ser Asn Tyr or is missing or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4$ is missing and Xaa_5 is Asn;

Xaa_8 is Glu or Asp;

Xaa_9 is Leu, Ile, Val, Trp, Tyr or Phe;

Xaa_{16} is Thr, Ala, Trp;

Xaa_{19} is Trp, Tyr, Phe or Leu or is missing; and $Xaa_{20}\ Xaa_{21}$ is AspPhe.

In various embodiments the invention features a purified polypeptide comprising the amino acid sequence (II): $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ wherein, Xaa_9 is Leu, Ile or Val and Xaa_{16} is Trp, Tyr or Phe; Xaa_9 is Trp, Tyr or Phe, and Xaa_{16} is Thr or Ala; Xaa_{19} is Trp, Tyr, Phe and $Xaa_{20}\ Xaa_{21}$ is AspPhe; and $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4$ is missing and Xaa_5 is Asn; the peptide comprises fewer than 50, 40, 30 or 25 amino acids; or fewer than five amino acids precede Cys_6.

In certain embodiments the peptide includes a peptide comprising or consisting of the amino acid sequence $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ Cys Cys Glu Xaa_9 Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr $Xaa_{20}\ Xaa_{21}$ (II) (SEQ ID NO:2) wherein Xaa_9 is any amino acid: wherein Xaa_9 is any amino acid other than Leu; wherein Xaa_9 is selected from Phe, Trp and Tyr; wherein Xaa_9 is selected from any other natural or non-natural aromatic amino acid; wherein Xaa_9 is Tyr; wherein Xaa_9 is Phe; wherein Xaa_9 is Trp; wherein $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ is Asn Ser Ser Asn Tyr; wherein Xaa_1, Xaa_2, Xaa_3, Xaa_4, and Xaa_5 are missing; wherein Xaa_1, Xaa_2, Xaa_3 and Xaa_4 are missing; wherein Xaa_1, Xaa_2 and Xaa_3 are missing; wherein Xaa_1 and Xaa_2 are missing; wherein Xaa_1 is missing; wherein $Xaa_{20}\ Xaa_{21}$ is AspPhe or is missing or Xaa_{20} is Asn or Glu and Xaa_{21} is missing or $Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ is missing; wherein $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ and Tyr $Xaa_{20}\ Xaa_{21}$ are missing. In the case of a peptide comprising the sequence (I): $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ wherein: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ is missing and/or the sequence

Xaa_{19} Xaa_{20} Xaa_{21} is missing, the peptide can still contain additional carboxyterminal or amino terminal amino acids or both. In the case of peptides missing one or more terminal amino acids such as Xaa_1 or Xaa_{21}, the peptide can still contain additional carboxyterminal or amino terminal amino acids or both.

In certain embodiments, the peptide includes disulfide bonds between Cys_6 and Cys_{11}, between Cys_7 and Cys_{15} and between Cys_{10} and Cys_{16}. In other embodiments, the peptide is a reduced peptide having no disulfide bonds. In still other embodiments the peptide has one or two disulfide bonds chosen from: a disulfide bond between Cys_6 and Cys_{11}, a disulfide bond between Cys_7 and Cys_{15} and a disulfide bond between Cys_{10} and Cys_{16}.

In certain embodiments, one or more amino acids can be replaced by a non-naturally occurring amino acid or a naturally or non-naturally occurring amino acid analog. There are many amino acids beyond the standard 20. Some are naturally-occurring others are not (see, for example, Hunt, The Non-Protein Amino Acids: In Chemistry and Biochemistry of the Amino Acids, Barrett, Chapman and Hall, 1985). For example, an aromatic amino acid can be replaced by 3,4-dihydroxy-L-phenylalanine, 3-iodo-L-tyrosine, triiodothyronine, L-thyroxine, phenylglycine (Phg) or nor-tyrosine (norTyr). Phg and norTyr and other amino acids including Phe and Tyr can be substituted by, e.g., a halogen, -CH3, -OH, $-CH_2NH_3$, -C(O)H, $-CH_2CH_3$, -CN, $-CH_2CH_2CH_3$, -SH, or another group. Any amino acid can be substituted by the D-form of the amino acid.

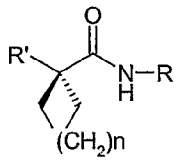
With regard to non-naturally occurring amino acids or a naturally and non-naturally occurring amino acid analogs, a number of substitutions in the peptide of formula I or the peptide of formula II are possible alone or in combination.

Xaa_8 can be replaced by *gamma*-Hydroxy-Glu or *gamma*-Carboxy-Glu.

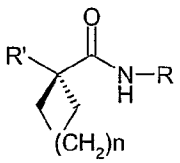
Xaa_9 can be replaced by an alpha substituted amino acid such as L-*alpha*-methylphenylalanine or by analogues such as: 3-Amino-Tyr; $Tyr(CH_3)$; $Tyr(PO_3(CH_3)_2)$; $Tyr(SO_3H)$; *beta*-Cyclohexyl-Ala;

beta-(1-Cyclopentenyl)-Ala; *beta*-Cyclopentyl-Ala; *beta*-Cyclopropyl-Ala; *beta*-Quinolyl-Ala; *beta*-(2-Thiazolyl)-Ala; *beta*-(Triazole-1-yl)-Ala; *beta*-(2-Pyridyl)-Ala; *beta*-(3-Pyridyl)-Ala; Amino-Phe; Fluoro-Phe; Cyclohexyl-Gly; *t*Bu-Gly; *beta*-(3-benzothienyl)-Ala; *beta*-(2-thienyl)-Ala; *5*-Methyl-Trp; and *4*-Methyl-Trp.

Xaa_{13} can be an N(alpha)-C(*alpha*) cyclized amino acid analogues with the structure:



n = 0, 1, 2, 3 . Xaa_{13} can also be homopro (L-pipecolic acid); hydroxy-Pro; 3,4-Dehydro-Pro; 4-fluoro-Pro; or *alpha*-methyl-Pro.



When Xaa_{13} is Gly, Ala, Leu or Val, Xaa_{14} can be: n = 0, 1, 2, 3

Xaa_{14} can also be an alpha-substitued or N-methylated amino acid such as *alpha*-amino isobutyric acid (*aib*), L/D-*alpha*-ethylalanine (L/D-isovaline), L/D-methylvaline, or L/D-*alpha*-methylleucine or a non-natural amino acid such as *beta*-fluoro-Ala.

Xaa_{17} can be *alpha*-amino isobutyric acid (*aib*) or L/D-*alpha*-ethylalanine (L/D-isovaline).

Further examples of unnatural amino acids include: an unnatural analogue of tyrosine; an unnatural analogue of glutamine; an unnatural analogue of phenylalanine; an unnatural analogue of serine; an unnatural analogue of threonine; an alkyl, aryl, acyl, azido, cyano, halo, hydrazine, hydrazide, hydroxyl, alkenyl, alkynl, ether, thiol, sulfonyl, seleno, ester, thioacid, borate, boronate, phospho, phosphono, phosphine, heterocyclic, enone, imine, aldehyde, hydroxylamine, keto, or amino substituted amino acid, or any combination thereof; an amino

acid with a photoactivatable cross-linker; a spin-labeled amino acid; a fluorescent amino acid; an amino acid with a novel functional group; an amino acid that covalently or noncovalently interacts with another molecule; a metal binding amino acid; a metal-containing amino acid; a radioactive amino acid; a photocaged and/or photoisomerizable amino acid; a biotin or biotin-analogue containing amino acid; a glycosylated or carbohydrate modified amino acid; a keto containing amino acid; amino acids comprising polyethylene glycol or polyether; a heavy atom substituted amino acid (e.g., an amino acid containing deuterium, tritium, ^{13}C, ^{15}N, or ^{18}O); a chemically cleavable or photocleavable amino acid; an amino acid with an elongated side chain; an amino acid containing a toxic group; a sugar substituted amino acid, e.g., a sugar substituted serine or the like; a carbon-linked sugar-containing amino acid; a redox-active amino acid; an α.-hydroxy containing acid; an amino thio acid containing amino acid; an α, α disubstituted amino acid; a β-amino acid; a cyclic amino acid other than proline; an O-methyl-L-tyrosine; an L-3-(2-naphthyl)alanine; a 3-methyl-phenylalanine; a *p*-acetyl-L-phenylalanine; an 0-4-allyl-L-tyrosine; a 4-propyl-L-tyrosine; a tri-O-acetyl-GlcNAcβ-serine; an L-Dopa; a fluorinated phenylalanine; an isopropyl-L-phenylalanine; a p-azido-L-phenylalanine; a p-acyl-L-phenylalanine; a p-benzoyl-L-phenylalanine; an L-phosphoserine; a phosphonoserine; a phosphonotyrosine; a p-iodo-phenylalanine; a 4-fluorophenylglycine; a p-bromophenylalanine; a p-amino-L-phenylalanine; an isopropyl-L-phenylalanine; L-3-(2-naphthyl)alanine; an amino-, isopropyl-, or O-allyl-containing phenylalanine analogue; a dopa, O-methyl-L-tyrosine; a glycosylated amino acid; a p-(propargyloxy)phenylalanine; dimethyl-Lysine; hydroxy-proline; mercaptopropionic acid; methyl-lysine; 3-nitro-tyrosine; norleucine; pyro-glutamic acid; Z (Carbobenzoxyl); ε-Acetyl-Lysine; β-alanine; aminobenzoyl derivative; aminobutyric acid (Abu); citrulline; aminohexanoic acid; aminoisobutyric acid; cyclohexylalanine; d-cyclohexylalanine; hydroxyproline; nitro-arginine; nitro-phenylalanine; nitro-tyrosine; norvaline; octahydroindole carboxylate; ornithine; penicillamine; tetrahydroisoquinoline; acetamidomethyl protected amino acids and pegylated amino acids. Further examples of unnatural amino acids and amino acid analogs can be found in U.S. 20030108885, U.S. 20030082575, and the references cited therein.

In some embodiments, an amino acid can be replaced by a naturally-occurring, non-essential amino acid, e.g., taurine.

Methods to manfacture peptides containing unnatural amino acids can be found in, for example, U.S. 20030108885, U.S. 20030082575, Deiters et al., J Am Chem Soc. (2003) 125:11782-3, Chin et al., Science (2003) 301:964-7, and the references cited therein.

Peptides that include non-natural amino acids can also be prepared using the methods described in WO02086075

The peptides of the invention can have one or more conventional peptide bonds replaced by an alternative bond. Such replacements can increase the stability of the peptide. For example, replacement of the peptide bond between Cys_{18} and Xaa_{19} with an alternative bond can reduce cleavage by carboxy peptidases and may increase half-life in the digestive tract. Bonds that can replace peptide bonds include: a retro-inverso bonds (C(O)-NH instead of NH-C(O); a reduced amide bond (NH-CH_2); a thiomethylene bond (S-CH_2 or CH_2-S); an oxomethylene bond (O-CH_2 or CH_2-O); an ethylene bond (CH_2-CH_2); a thioamide bond (C(S)-NH); a trans-olefine bond (CH=CH); an fluoro substituted trans-olefine bond (CF=CH); a ketomethylene bond (C(O)-CHR or CHR-C(O) wherein R is H or CH_3; and a fluoro-ketomethylene bond (C(O)-CFR or CFR-C(O) wherein R is H or F or CH_3.

The peptides of the invention can be modified using standard modifications. Modifications may occur at the amino (N-), carboxy (C-) terminus, internally or a combination of any of the preceeding. In one aspect of the invention, there may be more than one type of modification of the peptide. Modifications include but are not limited to: acetylation, amidation, biotinylation, cinnamoylation, farnesylation, formylation, myristoylation, palmitoylation, phosphorylation (Ser, Tyr or Thr), stearoylation, succinylation, sulfurylation and cyclisation (via disulfide bridges or amide cyclisation), and modification by Cy3 or Cy5. The peptides of the invention may also be modified by 2, 4-dinitrophenyl (DNP), DNP-lysin, modification by 7-Amino-4-methyl-coumarin (AMC), flourescein, NBD (7-Nitrobenz-2-Oxa-1,3-Diazole), p-nitro-anilide, rhodamine B, EDANS (5-((2-aminoethyl)amino)naphthalene-1- sulfonic acid), dabcyl, dabsyl,

dansyl, texas red, FMOC, and Tamra (Tetramethylrhodamine). The peptides of the invention may also be conjugated to, for example, polyethylene glycol (PEG); alkyl groups (e.g., C1-C20 straight or branched alkyl groups); fatty acid radicals; combinations of PEG, alkyl groups and fatty acid radicals (see U.S. Patent 6,309,633; Soltero et al., 2001 Innovations in Pharmaceutical Technology 106-110); BSA and KLH (Keyhole Limpet Hemocyanin).

The peptides and agonists of the invention can be chemically modified to increase therapeutic activity by synthetically adding sugar moieties (WO 88/02756; WO 89/09786; DE 3910667 A1, EP 0 374 089 A2; and U.S. 4,861,755), adding cationic anchors (EP0363589), lipid moieties (WO91/09837; U.S. 4,837,303) or the substituents described as compounds I, II, and III in US5552520.

When Xaa_9 is Trp, Tyr or Phe or when Xaa_{16} is Trp the peptide has a potentially functional chymotrypsin cleavage site that is located at a position where cleavage may alter GC-C receptor binding by the peptide. When Xaa_9 is Lys or Arg or when Xaa_{16} is Lys or Arg, the peptide has a potentially functional trypsin cleavage site that is located at a position where cleavage may alter GC-C receptor binding by the peptide.

When Xaa_{19} is Trp, Tyr or Phe, the peptide has a chymotrypsin cleavage site that is located at a position where cleavage will liberate the portion of the peptide carboxy-terminal to Xaa_{19}. When Xaa_{19} is Leu, Ile or Val, the peptide can have a chymotrypsin cleavage site that is located at a position where cleavage will liberate the portion of the peptide amino-terminal to Xaa_{19}. At relatively high pH the same effect is seen when Xaa_{19} is His. When Xaa_{19} is Lys or Arg, the peptide has a trypsin cleavage site that is located at a position where cleavage will liberate portion of the peptide carboxy-terminal to Xaa_{19}. Thus, if the peptide includes an analgesic peptide carboxy-terminal to Xaa_{19}, the peptide will be liberated in the digestive tract upon exposure to the appropriate protease. Among the analgesic peptides which can be included in the peptide and/or coadministered with the peptide are: AspPhe (as $Xaa_{20}Xaa_{21}$), endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, ziconotide, and substance P and other analgesic peptides described herein. These peptides can, for example, be used to replace $Xaa_{20}Xaa_{21}$.

When Xaa_1 or the amino-terminal amino acid of the peptide of the invention (e.g., Xaa_2 or Xaa_3) is Trp, Tyr or Phe, the peptide has a chymotrypsin cleavage site that is located at a position where cleavage will liberate the portion of the peptide amino-terminal to Xaa_1 (or Xaa_2 or Xaa_3) along with Xaa_1, Xaa_2 or Xaa_3. When Xaa_1 or the amino-terminal amino acid of the peptide of the invention (e.g., Xaa_2 or Xaa_3) is Lys or Arg, the peptide has a trypsin cleavage site that is located at a position where cleavage will liberate portion of the peptide amino-terminal to Xaa_1 along with Xaa_1, Xaa_2 or Xaa_3). When Xaa_1 or the amino-terminal amino acid of the peptide of the invention is Leu, Ile or Val, the peptide can have a chymotrypsin cleavage site that is located at a position where cleavage will liberate the portion of the peptide amino-terminal to Xaa_1. At relatively high pH the same effect is seen when Xaa_1 is His. Thus, for example, if the peptide includes an analgesic peptide amino-terminal to Xaa_1, the peptide will be liberated in the digestive tract upon exposure to the appropriate protease. Among the analgesic peptides which can be included in the peptide are: AspPhe, endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, and substance p and other analgesic peptides described herein.

When fully folded, disulfide bonds may be present between: Cys_6 and Cys_{11}; Cys_7 and Cys_{15}; and Cys_{10} and Cys_{18}. The peptides of the invention bear some sequence similarity to ST peptides. However, they include amino acid changes and/or additions that improve functionality. These changes can, for example, increase or decrease activity (e.g., increase or decrease the ability of the peptide to stimulate intestinal motility), alter the ability of the peptide to fold correctly, alter the stability of the peptide, alter the ability of the peptide to bind the GC-C receptor and/or decrease toxicity. In some cases the peptides may function more desirably than wild-type ST peptide. For example, they may limit undesirable side effects such as diarrhea and dehydration.

In some embodiments one or both members of one or more pairs of Cys residues which normally form a disulfide bond can be replaced by homocysteine, penicillamine, 3-mercaptoproline (Kolodziej et al. 1996 Int J Pept Protein Res 48:274); β, β dimethylcysteine

(Hunt et al. 1993 Int J Pept Protein Res 42:249) or diaminopropionic acid (Smith et al. 1978 J Med Chem 21:117) to form alternative internal cross-links at the positions of the normal disulfide bonds.

In addition, one or more disulfide bonds can be replaced by alternative covalent cross-links, e.g., an amide linkage ($-CH_2CH(O)NHCH_2-$ or $-CH_2NHCH(O)CH_2-$), an ester linkage, a thioester linkage, a lactam bridge, a carbamoyl linkage, a urea linkage, a thiourea linkage, a phosphonate ester linkage, an alkyl linkage ($-CH_2CH_2CH_2CH_2-$), an alkenyl linkage($-CH_2CH=CHCH_2-$), an ether linkage ($-CH_2CH_2OCH_2-$ or $-CH_2OCH_2CH_2-$), a thioether linkage ($-CH_2CH_2SCH_2-$ or $-CH_2SCH_2CH_2-$), an amine linkage ($-CH_2CH_2NHCH_2-$ or $-CH_2NHCH_2CH_2-$) or a thioamide linkage ($-CH_2CH(S)HNHCH_2-$ or $-CH_2NHCH(S)CH_2-$). For example, Ledu et al. (Proc Nat'l Acad. Sci. 100:11263-78, 2003) describe methods for preparing lactam and amide cross-links. Schafmeister et al. (J. Am. Chem. Soc. 122:5891, 2000) describes stable, hydrocarbon cross-links. Hydrocarbon cross links can be produced via metathesis (or methathesis followed by hydrogenation in the case of saturated hydrocarbons cross-links) using one or another of the Grubbs catalysts (available from Materia, Inc. and Sigma-Aldrich and described, for example, in U.S. Patent No. 5,831,108 and 6,111,121). In some cases, the generation of such alternative cross-links requires replacing the Cys residues with other residues such as Lys or Glu or non-naturally occurring amino acids. In addition the lactam, amide and hydrocarbon cross-links can be used to stabilize the peptide even if they link amino acids at postions other than those occupied by Cys. Such cross-links can occur between two amino acids that are separated by two amino acids or between two amino acids that are separated by six amino acids (see, e.g., Schafmeister et al. (J. Am. Chem. Soc. 122:5891, 2000)).

In the case of a peptide comprising the sequence (I): $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ Cys Cys Glu Xaa_9 Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr $Xaa_{20}\ Xaa_{21}$ (II) wherein: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ is missing and/or the sequence $Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ is missing, the peptide can still contain additional carboxyterminal or amino terminal amino acids

or both. For example, the peptide can include an amino terminal sequence that facilitates recombinant production of the peptide and is cleaved prior to administration of the peptide to a patient. The peptide can also include other amino terminal or carboxyterminal amino acids. In some cases the additional amino acids protect the peptide, stabilize the peptide or alter the activity of the peptide. In some cases some or all of these additional amino acids are removed prior to administration of the peptide to a patient. The peptide can include 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 40, 50, 60, 70 80, 90, 100 or more amino acids at its amino terminus or carboxy terminus or both. The number of flanking amino acids need not be the same. For example, there can be 10 additional amino acids at the amino terminus of the peptide and none at the carboxy terminus.

In one embodiment the peptide comprises the amino acid sequence (I): $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ wherein: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ is missing; Xaa_8 is Glu; Xaa_9 is Leu, Ile, Lys, Arg, Trp, Tyr or Phe; Xaa_{12} is Asn; Xaa_{13} is Pro; Xaa_{14} is Ala; Xaa_{16} is Thr, Ala, Lys, Arg, Trp; Xaa_{17} is Gly; Xaa_{19} is Tyr or Leu; and $Xaa_{20}\ Xaa_{21}$ is AspPhe or is missing. Where $Xaa_{20}\ Xaa_{21}$ and/or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5$ are missing, there may be additional flanking amino acids in some embodiments. In certain embodiments of a composition comprising a peptide having the sequence (I): $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$, the peptide does not comprise or consist of any of the peptides of Table I.

In a second aspect, the invention also features a therapeutic or prophylactic method comprising administering to a patient a pharmaceutical composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

The peptides can be co-administered with or linked, e.g., covalently linked to any of a variety of other peptides or compounds including analgesic peptides or analgesic compounds including, without limitation, the agents described herein.

Amino acid, non-amino acid, peptide and non-peptide spacers can be interposed between a peptide that is a GC-C receptor agonsit and a peptide that has some other biological function, e.g., an analgesic peptide or a peptide used to treat obesity. The linker can be one that is cleaved from the flanking peptides *in vivo* or one that remains linked to the flanking peptides *in vivo*. For example, glycine, beta-alanine, glycyl-glycine, glycyl-beta-alanine, gamma-aminobutyric acid, 6-aminocaproic acid, L-phenylalanine, L-tryptophan and glycil-L-valil-L-phenylalanine can be used as spacers (Chaltin et al. 2003 Helvetica Chimica Acta 86:533-547; Caliceti et al. 1993 FARMCO 48:919-32) as can polyethylene glycols (Butterworth et al. 1987 J. Med. Chem 30:1295-302) and maleimide derivatives (King et al. 2002 Tetrahedron Lett. 43:1987-1990). Various other linkers are described in the literature (Nestler 1996 Molecular Diversity 2:35-42; Finn et al. 1984 Biochemistry 23:2554-8; Cook et al. 1994 Tetrahedron Lett. 35:6777-80; Brokx et al. 2002 Journal of Controlled Release 78:115-123; Griffin et al. 2003 J. Am. Chem. Soc. 125:6517-6531; Robinson et al. 1998 Proc. Natl. Acad. Sci. USA 95:5929-5934).

The peptides of the invention can be attached to one, two or more different moieties each providing the same or different functions. For example, the peptide can be linked to a molecule that is an analgesic and to a peptide that is used to treat obesity. The peptide and various moieties can be ordered in various ways. For example, a peptide of the invention can have an analgesic peptide linked to its amino terminus and an anti-obesity peptide linked to its carboxy terminus. The additional moieties can be directly covalently bonded to the peptide or can be bonded via linkers.

The peptides of the invention can be a cyclic peptide or a linear peptide. In addition, multiple copies of the same peptide can be incorporated into a single cyclic or linear peptide.

The peptides can include the amino acid sequence of a peptide that occurs naturally in a vertebrate (e.g., mammalian) species or in a bacterial species. In addition, the peptides can be partially or completely non-naturally occurring peptides. Also within the invention are peptidomimetics corresponding to the peptides of the invention.

In various embodiments, the patient is suffering from a gastrointestinal disorder; the patient is suffering from a disorder selected from the group consisting of: gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein); the patient is suffering from a gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, inflammatory bowel disease, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein); the composition is administered orally; the peptide comprises 30 or fewer amino acids, the peptide comprises 20 or fewer amino acids, and the peptide comprises no more than 5 amino acids prior to Cys_6; the peptide comprises 150, 140, 130, 120, 110, 100, 90, 80, 70, 60, 50, 40, or 30 or fewer amino acids. In other embodiments, the peptide comprises 20 or fewer amino acids. In other embodiments the peptide comprises no more than 20, 15, 10, or 5 peptides subsequent to Cys_{18}. In certain embodiments Xaa_{19} is a chymotrypsin or trypsin cleavage site and an analgesic peptide is present immediately following Xaa_{19}.

In a third aspect, the invention features a method for treating a patient suffering from constipation. Clinically accepted criteria that define constipation range from the frequency of bowel movements, the consistency of feces and the ease of bowel movement. One common definition of constipation is less than three bowel movements per week. Other definitions include abnormally hard stools or defecation that requires excessive straining (Schiller 2001, Aliment Pharmacol Ther 15:749-763). Constipation may be idiopathic (functional constipation or slow transit constipation) or secondary to other causes including neurologic, metabolic or endocrine disorders. These disorders include diabetes mellitus, hypothyroidism, hyperthyroidism, hypocalcaemia, Multiple Sclerosis, Parkinson's disease, spinal cord lesions, Neurofibromatosis, autonomic neuropathy, Chagas disease, Hirschsprung's disease and Cystic fibrosis. Constipation may also be the result of surgery (postoperative ileus) or due to the use of drugs such as analgesics (like opioids), antihypertensives, anticonvulsants, antidepressants, antispasmodics and antipsychotics. The method of treating constipation comprises administering a pharamaceutical composition comprising or consisting essentially of a peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In various embodiments, the constipation is associated with use of a therapeutic agent; the constipation is associated with a neuropathic disorder; the constipation is post-surgical constipation (postoperative ileus); and the constipation associated with a gastrointestinal disorder; the constipation is idiopathic (functional constipation or slow transit constipation); the constipation is associated with neuropathic, metabolic or endocrine disorder (e.g., diabetes mellitus, hypothyroidism, hyperthyroidism, hypocalcaemia, Multiple Sclerosis, Parkinson's disease, spinal cord lesions, neurofibromatosis, autonomic neuropathy, Chagas disease, Hirschsprung's disease or cystic fibrosis). Constipation may also be the result of surgery (postoperative ileus) or due the use of drugs such as analgesics (e.g., opioids), antihypertensives, anticonvulsants, antidepressants, antispasmodics and antipsychotics.

In a fourth aspect, the invention features a method for treating a patient suffering a gastrointestinal disorder, the method comprising administering to the patient a pharmaceutical composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In various embodiments, the patient is suffering from a gastrointestinal disorder; the patient is suffering from a disorder selected from the group consisting of: gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein), obesity, congestive heart failure, or benign prostatic hyperplasia.

In a fifth aspect, the invention features a method for increasing gastrointestinal motility in a patient, the method comprising administering to a patient a pharmaceutical composition comprising a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In a sixth aspect, the invention features a method for increasing the activity of (activating) an intestinal guanylate cyclase (GC-C) receptor in a patient, the method comprising administering to a patient a pharmaceutical composition comprising a purified peptide

comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In a seventh aspect, the invention features an isolated nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In an eighth aspect the invention features a method for treating constipation, the method comprising administering an agonist of the intestinal guanylate cyclase (GC-C) receptor. In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes four Cys that form two disulfide bonds, and the peptide includes six Cys that form three disulfide bonds.

In a ninth aspect, the invention features a method for treating a gastrointestinal disorder, gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein), obesity, congestive heart failure, or benign prostatic hyperplasia, the method comprising administering an agonist of the intestinal guanylate cyclase (GC-C) receptor either orally, by rectal suppository, or parenterally. In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes four Cys that form two disulfide bonds, and the peptide includes six Cys that form three disulfide bonds.

In a tenth aspect, the invention features a method for treating a gastrointestinal disorder selected from the group consisting of: gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein), the method comprising administering an agonist of the intestinal guanylate cyclase (GC-C) receptor. In various embodiments the composition is administered orally; the peptide comprises 30 or fewer amino acids, the peptide comprises 20 or fewer amino acids, and the peptide comprises no more than 5 amino acids prior to Cys_5.

In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes four Cys that form two disulfide bonds, and the peptide includes six Cys that form three disulfide bonds.

In an eleventh aspect, the invention features a method for treating obesity, the method comprising administering a complete or partial agonist of the intestinal guanylate cyclase (GC-C) receptor. In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes four Cys that form two disulfide bonds, and the peptide includes six Cys that form three disulfide bonds. The agonist can be administered alone or in combination with one or more agents for treatment of obesity, including but not limited to the anti-obesity agents described herein. Thus, for example, PYY_{3-36} can be fused to the carboxy or amino terminus of a peptide of the invention. Such a fusion protein can include a chymostrypsin or trypsin cleavage site that can permit cleavage to separate the two peptides.

In a twelfth aspect, the invention features a method for treating obesity, the method comprising administering to a patient a pharmaceutical composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In a thirteenth aspect, the invention features a composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein. In one embodiment, the composition is a pharmaceutical composition.

In a fourteenth aspect, the invention features a method for treating congestive heart failure, the method comprising administering to a patient a pharmaceutical composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

The peptide can be administered in combination with one or more agents for treatment of congestive heart failure, for example, a natriuretic peptide such as atrial natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide), a diuretic, or an inhibitor of angiotensin converting enzyme.

In a fifteenth aspect, the invention features a method for treating benign prostatic hyperplasia, the method comprising administering to a patient a pharmaceutical composition comprising a

purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein. The peptide can be administered alone or in combination with another agent for treatment of BPH, for example, a 5-alpha reductase inhibitor (e.g., finasteride) or an alpha adrenergic inhibitor (e.g., doxazosine).

In a sixteenth aspect, the invention features a method for treating or reducing pain, including visceral pain, pain associated with a gastrointestinal disorder or pain associated with some other disorder, the method comprising administering to a patient a pharmaceutical composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In a seventeenth aspect, the invention features a method for treating inflammation, including inflammation of the gastrointestinal tract, e.g., inflammation associated with a gastrointestinal disorder or infection or some other disorder, the method comprising administering to a patient a pharmaceutical composition comprising a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Xaa_{12}\ Xaa_{13}\ Xaa_{14}\ Cys_{15}\ Xaa_{16}\ Xaa_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (I) or $Xaa_1\ Xaa_2\ Xaa_3\ Xaa_4\ Xaa_5\ Cys_6\ Cys_7\ Xaa_8\ Xaa_9\ Cys_{10}\ Cys_{11}\ Asn_{12}\ Pro_{13}\ Ala_{14}\ Cys_{15}\ Xaa_{16}\ Gly_{17}\ Cys_{18}\ Xaa_{19}\ Xaa_{20}\ Xaa_{21}$ (II) as described herein.

In an eighteenth aspect, the invention features a method for treating congestive heart failure, the method comprising administering a complete or partial agonist of the intestinal guanylate cyclase (GC-C) receptor. The agonist can be administered alone or in combination with another agent for treatment of congestive heart failure, for example, a natriuretic peptide such as atrial

natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide, a diuretic, or an inhibitor of angiotensin converting enzyme.

In a nineteenth aspect, the invention features a method for treating BPH, the method comprising administering a complete or partial agonist of the intestinal guanylate cyclase (GC-C) receptor. The agonist can be administered alone or in combination with another agent for treatment of BPH, for example, a 5-alpha reductase inhibitor (e.g., finasteride) or an alpha adrenergic inhibitor (e.g., doxazosine).

In a twentieth aspect, the invention features isolated nucleic acid molecules comprising a sequence encoding a peptide of the invention. Also within the invention are vectors, e.g., expression vectors that include such nucleic acid molecules and can be used to express a peptide of the invention in a cultured cell (e.g., a eukaryotice cell or a prokaryotic cell). The vector can further include one or more regulatory elements, e.g., a heterologous promoter or elements required for translation operably linked to the sequence encoding the peptide. In some cases the nucleic acid molecule will encode an amino acid sequence that includes the amino acid sequence of a peptide of the invention. For example, the nucleic acid molecule can encode a preprotein or a preproprotein that can be processed to produce a peptide of the invention.

A vector that includes a nucleotide sequence encoding a peptide of the invention or a peptide or polypeptide comprising a peptide of the invention may be either RNA or DNA, single- or double-stranded, prokaryotic, eukaryotic, or viral. Vectors can include transposons, viral vectors, episomes, (e.g., plasmids), chromosomes inserts, and artificial chromosomes (e.g. BACs or YACs). Suitable bacterial hosts for expression of the encode peptide or polypeptide include, but are not limited to, *E. coli*. Suitable eukaryotic hosts include yeast such as *S. cerevisiae*, other fungi, vertebrate cells, invertebrate cells (e.g., insect cells), plant cells, human cells, human tissue cells, and whole eukaryotic organisms. (e.g., a transgenic plant or a transgenic animal). Further, the vector nucleic acid can be used to transfect a virus such as

vaccinia or baculovirus (for example using the Bac-to-Bac® Baculovirus expression system (Invitrogen Life Technologies, Carlsbad, CA)).

As noted above the invention includes vectors and genetic constructs suitable for production of a peptide of the invention or a peptide or polypeptide comprising such a peptide. Generally, the genetic construct also includes, in addition to the encoding nucleic acid molecule, elements that allow expression, such as a promoter and regulatory sequences. The expression vectors may contain transcriptional control sequences that control transcriptional initiation, such as promoter, enhancer, operator, and repressor sequences. A variety of transcriptional control sequences are well known to those in the art and may be functional in, but are not limited to, a bacterium, yeast, plant, or animal cell. The expression vector can also include a translation regulatory sequence (e.g., an untranslated 5' sequence, an untranslated 3' sequence, a poly A addition site, or an internal ribosome entry site), a splicing sequence or splicing regulatory sequence, and a transcription termination sequence. The vector can be capable of autonomous replication or it can integrate into host DNA.

The invention also includes isolated host cells harboring one of the forgoing nucleic acid molecules and methods for producing a peptide by culturing such a cell and recovering the peptide or a precursor of the peptide. Recovery of the peptide or precursor may refer to collecting the growth solution and need not involve additional steps of purification. Proteins of the present invention, however, can be purified using standard purification techniques, such as, but not limited to, affinity chromatography, thermaprecipitation, immunoaffinity chromatography, ammonium sulfate precipitation, ion exchange chromatography, filtration, electrophoresis and hydrophobic interaction chromatography.

The peptides can be purified. Purified peptides are peptides separated from other proteins, lipids, and nucleic acids or from the compounds from which is it synthesized. The polypeptide can constitute at least 10, 20, 50 70, 80 or 95% by dry weight of the purified preparation.

In a twenty-first aspect, the invention features a method of increasing the level of cyclic guanosine 3'-monophosphate (cGMP) in an organ, tissue (e.g, the intestinal mucosa), or cell (e.g., a cell bearing GC-A receptor) by administering to a patient a composition comprising or consisting essentially of a purified peptide comprising, consisting of or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Xaa_4 Xaa_5 Cys_6 Cys_7 Xaa_8 Xaa_9 Cys_{10} Cys_{11} Xaa_{12} Xaa_{13} Xaa_{14} Cys_{15} Xaa_{16} Xaa_{17} Cys_{18} Xaa_{19} Xaa_{20} Xaa_{21} (I) or Xaa_1 Xaa_2 Xaa_3 Xaa_4 Xaa_5 Cys_6 Cys_7 Xaa_8 Xaa_9 Cys_{10} Cys_{11} Asn_{12} Pro_{13} Ala_{14} Cys_{15} Xaa_{16} Gly_{17} Cys_{18} Xaa_{19} Xaa_{20} Xaa_{21} (II) as described herein.

In a twenty-second aspect, the invention features polypeptides comprising, consisting or consisting essentially of the amino acid sequence Xaa_1 Xaa_2 Xaa_3 Xaa_4 Xaa_5 Cys_6 Cys_7 Xaa_8 Xaa_9 Cys_{10} Cys_{11} Xaa_{12} Xaa_{13} Xaa_{14} Cys_{15} Xaa_{16} Xaa_{17} Cys_{18} Xaa_{19} Xaa_{20} Xaa_{21} wherein: a) Xaa_8 or Xaa_9 is not present; b) neither Xaa_8 or Xaa_9 is present; c) one of Xaa_{12}, Xaa_{13} and Xaa_{14} is not present; d) two of Xaa_{12}, Xaa_{13} and Xaa_{14} are not present; e) three of Xaa_{12}, Xaa_{13} and Xaa_{14} are not present; f) one of Xaa_{16} and Xaa_{17} is not present; g) neither Xaa_{16} or Xaa_{17} is present and combinations thereof. In various embodiments, one, two, three, four or five of Xaa_1 Xaa_2 Xaa_3 Xaa_4 and Xaa_5 are not present. In other embodiments, one, two or three or Xaa_{19} Xaa_{20} and Xaa_{21} are missing.

In twenty third aspect, the invention features a method for treating a disorder ameliorated by increasing cGMP levels, the method comprising administering a pharmaceutical composition comprising, consisting essentially of or consisting of a peptide or agonist of the invention and a pharmaceutically acceptable carrier.

Among the useful peptides are peptides comprising, consisting of or consisting essentially of the amino acid sequence Xaa_1 Xaa_2 Xaa_3 Xaa_4 Xaa_5 Cys Cys Glu Xaa_9 Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Xaa_{20} Xaa_{21} (II) (SEQ ID NO:---) are the following peptides:
Gln Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)
Asn Thr Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)
Asn Leu Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Ile Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Ser Ser Gln Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Gln Ser Ser Gln Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Ser Ser Gln Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---).

Asn Ser Ser Asn Tyr Cys Cys Glu Ala Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Asn Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Asp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Cys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Gln Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Glu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Gly Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu His Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Met Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Pro Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Ser Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Thr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Asn Ser Ser Asn Tyr Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Ala Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Asn Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Asp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Cys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Gln Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Glu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

Cys Cys Glu Gly Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu His Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Met Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Pro Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Ser Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Thr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Ala Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Asn Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Asp Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Cys Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Gln Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Glu Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Gly Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu His Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Met Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Pro Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Ser Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Thr Cys Cys Asn Pro Ala Cys Thr Gly Cys; (SEQ ID NO:)
Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:)
Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Thr Gly Cys (SEQ ID NO:).

Also useful are peptides comprising, consisting of or consisting essentially of any of the following sequences:

Cys Cys Glu Leu Cys Cys Ala Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Val Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Leu Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Ile Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Pro Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Met Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Phe Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Trp Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Gly Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Ser Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Thr Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Cys Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Gln Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Tyr Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Asp Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Glu Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Lys Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Arg Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys His Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Ala Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Val Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Leu Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Ile Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Pro Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Met Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Phe Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Trp Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Glu Tyr Cys Cys Gly Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Ser Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Thr Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Cys Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Gln Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Tyr Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Asp Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Glu Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Lys Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Arg Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys His Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Ala Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Val Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Leu Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Ile Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Pro Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Met Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Phe Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Trp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Gly Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Ser Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Thr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Cys Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Gln Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Tyr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Asp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Glu Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Lys Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Arg Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys His Pro Ala Cys Thr Gly Cys

Cys Cys Glu Tyr Cys Cys Ala Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Val Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Leu Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Ile Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Pro Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Met Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Phe Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Trp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Gly Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Ser Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Thr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Cys Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Gln Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Tyr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Asp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Glu Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Lys Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Arg Pro Ala Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys His Pro Ala Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Asn Pro Thr Cys Thr Gly Cys
Cys Cys Glu Tyr Cys Cys Asn Pro Thr Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Cys Glu Phe Cys Cys Asn Pro Thr Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Asn Pro Thr Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Asn Pro Thr Cys Thr Gly Cys
Cys Cys Glu Leu Cys Cys Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Tyr Cys Cys Asn Gly Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Leu Cys Cys Asn Gly Ala Cys Thr Gly Cys

Cys Cys Glu Tyr Cys Cys Asn Gly Ala Cys Thr Gly Cys

Cys Cys Glu Phe Cys Cys Asn Gly Ala Cys Thr Gly Cys Tyr

Cys Cys Glu Phe Cys Cys Asn Gly Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys Asn Gly Ala Cys Thr Gly Cys Tyr

Cys Cys Glu Trp Cys Cys Asn Gly Ala Cys Thr Gly Cys

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Val Gly Cys Tyr

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Val Gly Cys Tyr

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Val Gly Cys

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Val Gly Cys

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Val Gly Cys Tyr

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Val Gly Cys

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Val Gly Cys Tyr

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Val Gly Cys

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Gly Gly Cys Tyr

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Gly Gly Cys Tyr

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Gly Gly Cys

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Gly Gly Cys

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Gly Gly Cys Tyr

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Gly Gly Cys

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Gly Gly Cys Tyr

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Gly Gly Cys

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Ala Cys Tyr

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Ala Cys Tyr

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Ala Cys

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Ala Cys

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Ala Cys Tyr

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Ala Cys

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Ala Cys Tyr

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Ala Cys

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Ala

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Val
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Leu
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Ile
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Pro
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Met
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Phe
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Trp
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Gly
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Ser
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Thr
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Cys
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Asn
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Gln
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Asp
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Glu
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Lys
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Arg
Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys His
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Ala
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Val
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Leu
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Ile
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Pro
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Met
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Phe
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Trp
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Gly
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Ser
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Thr
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Cys

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Asn
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Gln
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Asp
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Glu
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Lys
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Arg
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys His
Cys Cys Ala Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Val Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Leu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ile Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Met Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Phe Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Trp Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Gly Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ser Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Thr Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Cys Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Asn Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Gln Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Tyr Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Asp Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Lys Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Arg Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys His Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ala Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Val Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Leu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Ile Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Met Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Phe Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Trp Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Gly Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Ser Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Thr Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Cys Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Asn Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Gln Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Tyr Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Asp Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Lys Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys Arg Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

Cys Cys His Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys

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Cys Cys Val Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Leu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Ile Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Met Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Phe Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Trp Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Gly Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Ser Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Thr Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Cys Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Asn Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Gln Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Tyr Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Asp Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Lys Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Arg Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys His Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
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Cys Cys Glu Phe Cys Cys Cys Pro Ala Cys Thr Gly Cys Tyr
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Cys Cys Glu Phe Cys Cys Trp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Gly Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Ser Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Thr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Cys Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Gln Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Tyr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Asp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys Glu Pro Ala Cys Thr Gly Cys
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Cys Cys Glu Phe Cys Cys Arg Pro Ala Cys Thr Gly Cys
Cys Cys Glu Phe Cys Cys His Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Ala Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Val Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Leu Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Glu Trp Cys Cys Ile Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Pro Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Met Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Phe Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Trp Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Gly Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Ser Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Thr Pro Ala Cys Thr Gly Cys Tyr
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Cys Cys Glu Trp Cys Cys Gln Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Tyr Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Asp Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Glu Pro Ala Cys Thr Gly Cys Tyr
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Cys Cys Glu Trp Cys Cys Arg Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys His Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Glu Trp Cys Cys Ala Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Val Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Leu Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Ile Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Pro Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Met Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Phe Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Trp Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Gly Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Ser Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Thr Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Cys Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Gln Pro Ala Cys Thr Gly Cys
Cys Cys Glu Trp Cys Cys Tyr Pro Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys Asp Pro Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys Glu Pro Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys Lys Pro Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys Arg Pro Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys His Pro Ala Cys Thr Gly Cys

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Ala

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Val

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Leu

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Ile

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Pro

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Met

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Phe

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Trp

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Gly

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Ser

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Thr

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Cys

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Asn

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Gln

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Asp

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Glu

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Lys

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Arg

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys His

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Ala

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Val

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Leu

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Ile

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Pro

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Met

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Phe
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Trp
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Gly
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Ser
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Thr
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Cys
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Asn
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Gln
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Asp
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Glu
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Lys
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Arg
Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys His
Cys Cys Ala Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Val Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Leu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ile Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Met Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Phe Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Trp Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Gly Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ser Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Thr Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Cys Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Asn Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Gln Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Tyr Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Asp Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Lys Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Arg Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys His Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ala Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Val Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Leu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Ile Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Met Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Phe Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Trp Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Gly Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Ser Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Thr Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Cys Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Asn Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Gln Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Tyr Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Asp Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Lys Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Arg Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys His Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Ala Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Val Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Leu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ile Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Met Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Phe Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Trp Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Gly Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ser Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Thr Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Cys Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr

Cys Cys Asn Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Gln Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Tyr Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Asp Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Lys Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Arg Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys His Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr
Cys Cys Ala Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Val Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Leu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Ile Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Met Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Phe Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Trp Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Gly Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Ser Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Thr Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Cys Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Asn Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Gln Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Tyr Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Asp Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Lys Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys Arg Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys
Cys Cys His Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys

The invention also features deletion variants of any of the peptides described herein in which one, two, three or four amino acids (or non-natural amino acids or natural or non-natural amino acid analogs), other than a Cys (or an amino acid substituted for Cys, e.g, an amino acid capable of forming a covalent bond to another amino acid), are deleted. Where two (or more)

amino acids are deleted and the peptide comprises the sequence: Cys_a Cys_b Xaa Xaa Cys_c Cys_d Xaa Xaa Xaa Cys_e Xaa Xaa Cys_f, in some embodiments two or more deletions can be located between Cys_b and Cys_c and/or between Cys_d and Cys_e and/or between Cys_e and Cys_f. However, in other embodiments there is at most one deletion between each of Cys_b and Cys_c or between Cys_d and Cys_e or between Cys_e and Cys_f. Thus, the invention includes any of the peptides described herein comprising the sequence Cys_a Cys_b Xaa Xaa Cys_c Cys_d Xaa Xaa Xaa Cys_e Xaa Xaa Cys_f wherein: a) one amino acid between Cys_b and Cys_c is deleted; b) one amino acid between Cys_d and Cys_e is deleted; c) one amino acid between Cys_e and Cys_f is deleted; d) one amino acid between Cys_b and Cys_c is deleted and one amino acid between Cys_d and Cys_e is deleted; e) one amino acid between Cys_d and Cys_e is deleted and one amino acid between Cys_e and Cys_f is deleted; f) one amino acid between Cys_b and Cys_c is deleted and one amino acid between Cys_e and Cys_f is deleted or g) one amino acid between Cys_b and Cys_c is deleted, one amino acid between Cys_d and Cys_e is deleted and one amino acid between Cys_e and Cys_f is deleted. In certain embodiments, the various deletion variants are peptides that bind to and/or activate the GC-C receptor. In various embodiments, the various deletion variants are peptides that increase cGMP levels.

Deletion variants of Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:3) include the peptides listed in FIG. 11. In these deletion variants, any of the amino acids can be deleted and there can be one, two, three or four amino acids deleted other than Cys.

The invention also features insertion variants of any of the peptides described herein in which one, two, three or four amino acids (e.g., Gly or Ala) are inserted before or after any amino acid in the peptide. In some embodiments no more than one amino acid is inserted between two Cys. For example, where two or more amino acids are inserted and the peptide comprises the sequence Cys_a Cys_b Xaa Xaa Cys_c Cys_d Xaa Xaa Xaa Cys_e Xaa Xaa Cys_f, in some embodiments two or more insertions can be located between Cys_b and Cys_c or between Cys_d and Cys_e or between Cys_e and Cys_f. However, in other embodiments no more than one insertion is located between Cys_b and Cys_c or between Cys_d and Cys_e or between Cys_e and Cys_f. Thus, the invention features any of the peptides described herein comprising the sequence Cys_a

Cys_b Xaa Xaa Cys_c Cys_d Xaa Xaa Xaa Cys_e Xaa Xaa Cys_f wherein: a) one amino acid is inserted between Cys_b and Cys_c; b) one amino acid is inserted between Cys_d and Cys_e; c) one amino acid is inserted between Cys_e and Cys_f; d) one amino acid is inserted between Cys_b and Cys_c and one amino acid is inserted between Cys_d and Cys_e; e) one amino acid is inserted between Cys_d and Cys_e and one amino acid is inserted between Cys_e and Cys_f; f) one amino acid is inserted between Cys_b and Cys_c and one amino acid is inserted between Cys_e and Cys_f; or g) one amino acid is inserted between Cys_b and Cys_c, one amino acid is inserted between Cys_d and Cys_e and one amino acid is inserted between Cys_e and Cys_f. In addition, one or more amino acids can be inserted preceding Cys_a and/or one or more amino acids can be inserted following Cys_f.

In various embodiments, the various insertion variants are peptides that bind to and/or activate the GC-C receptor. In various embodiments, the various insertion variants are peptides that increase cGMP levels.

Insertion variants of Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:3) include those in which up to four amino acids (i.e., 0, 1, 2, 3 or 4) can be inserted after each amino acid. Thus, the invention includes peptides having the sequence: Cys $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Glu $Xaa_{(0-4)}$ Tyr $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Asn $Xaa_{(0-4)}$ Pro $Xaa_{(0-4)}$ Ala $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Thr $Xaa_{(0-4)}$ Gly $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Tyr $Xaa_{(0-4)}$) (SEQ ID NO:). The inserted amino acids can be any amino acid or amino acid analog (natural or non-natural) and can be the same or different. In certain embodiments the inserted amino acids are all Gly or all Ala or a combination of Gly and Ala.

FIG. 12 depicts insertion variants of the peptide having the sequence: Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:3).

The invention also features variants of peptides having the sequence Xaa_1 Xaa_2 Xaa_3 Xaa_4 Xaa_5 Cys_6 Cys_7 Xaa_8 Xaa_9 Cys_{10} Cys_{11} Xaa_{12} Xaa_{13} Xaa_{14} Cys_{15} Xaa_{16} Xaa_{17} Cys_{18} Xaa_{19} Xaa_{20} Xaa_{21} (SEQ ID NO:1), e.g., variants of Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys

Tyr (SEQ ID NO:3), in which up to four amino acids are deleted and/or up to four amino acids are inserted. The insertions and deletions can be between Cys_6 and Cys_{18} in SEQ ID NO:1 or they can be amino terminal to Cys_6 and/or carboxy terminal to Cys_{18} in SEQ ID NO:1.

The invention also features peptides which may include one or more of the peptide modifications, one or more non-natural amino acid or amino acid analogs, one or more of the disulfide bond alternatives or one more of the alternative peptide bonds described herein.

The peptides of the invention can be present with a counterion. Useful counterions include salts of: acetate, benzenesulfonate, benzoate, calcium edetate, camsylate, carbonate, citrate, edetate (EDTA), edisylate, embonate, esylate, fumarate, gluceptate, gluconate, glutamate, glycollylarsanilate, hexylresorcinate, iodide, bromide, chloride, hydroxynaphthoate, isethionate, lactate, lactobionate, estolate, maleate, malate, mandelate, mesylate, mucate, napsylate, nitrate, pantothenate, phosphate, salicylate, stearate, succinate, sulfate, tartarate, theoclate, acetamidobenzoate, adipate, alginate, aminosalicylate, anhydromethylenecitrate, ascorbate, aspartate, camphorate, caprate, caproate, caprylate, cinnamate, cyclamate, dichloroacetate, formate, gentisate, glucuronate, glycerophosphate, glycolate, hippurate, fluoride, malonate, napadisylate, nicotinate, oleate, orotate, oxalate, oxoglutarate, palmitate, pectinate, pectinate polymer, phenylethylbarbiturate, picrate, propionate, pidolate, sebacate, rhodanide, tosylate, and tannate.

The peptides and agonist of the intestinal guanylate cyclase (GC-C) receptor can be used to treat constipation or decreased intestinal motility, slow digestion or slow stomach emptying. The peptides can be used to relieve one or more symptoms of IBS (bloating, pain, constipation), GERD (acid reflux into the esophagus), duodenogastric reflux, functional dyspepsia, or gastroparesis (nausea, vomiting, bloating, delayed gastric emptying) and other disorders described herein.

The details of one or more embodiments of the invention are set forth in the accompanying description. All of the publications, patents and patent applications are hereby incorporated by reference.

FIGURES

Figure 1 depicts the results of LCMS analysis of recombinant SEQ ID NO:4 peptide and SEQ ID NO:5 peptide.

Figures 1b and 1c depict the results of LCMS analysis of synthetic SEQ ID NO:3 peptide and the blank.

Figure 2 depicts the results of the intestinal GC-C receptor activity assay of synthetic SEQ ID NO:4 peptide, SEQ ID NO:5 peptide and two different SEQ ID NO:3 peptides.

Figure 3a depicts the effect of recombinant SEQ ID NO:4 peptide and Zelnorm® in an acute murine gastrointestinal transit model.

Figure 3b depicts the effect of synthetic SEQ ID NO:3 peptide and Zelnorm® in an acute murine gastrointestinal transit model.

Figures 4a and 4b depict the effect of peptidesSEQ ID NO:5, SEQ ID NO:3, and SEQ ID NO:4 in an acute murine gastrointestinal transit model.

Figure 4c depicts the effect of SEQ ID NO:3 peptide in a chronic murine gastrointestinal transit model.

Figure 5a depicts the effect of SEQ ID NO:4 peptide and Zelnorm® in a suckling mouse intestinal secretion model.

Figure 5b depicts the effects of SEQ ID NO:3 and Zelnorm® in a mouse intestinal secretion model.

Figures 6a and 6b depict the effects of SEQ ID NO:4, SEQ ID NO:3 and SEQ ID NO:5 peptides in a mouse intestinal secretion model.

Figure 7 shows the results of experiment in which SEQ ID NO:3 activity was analyzed in the TNBS colonic distention model.

Figures 8a and 8b show the effects of differing doses of SEQ ID NO:5 and SEQ ID NO:3 in the PBQ writhing assay.

Figure 9 shows the results of Kd determination analysis using SEQ ID NO:3 in a competitive radioligand binding assay.

Figures 10a and 10b show bioavailability data for IV and orally administered SEQ ID NO:3 as detected by an ELISA assay and LCMS.

Figure 11 depicts deletion variants of a peptide having the sequence of SEQ ID NO:3.

Figure 12 depicts insertion variants of a peptide having the sequence of SEQ ID NO:3.

DETAILED DESCRIPTION

The peptides of the invention bind to the intestinal guanylate cyclase (GC-C) receptor, a key regulator of fluid and electrolyte balance in the intestine. When stimulated, this receptor, which is located on the apical membrane of the intestinal epithelial surface, causes an increase in intestinal epithelial cyclic GMP (cGMP). This increase in cGMP is believed to cause a decrease in water and sodium absorption and an increase in chloride and potassium ion secretion, leading to changes in intestinal fluid and electrolyte transport and increased intestinal

motility. The intestinal GC-C receptor possesses an extracellular ligand binding region, a transmembrane region, an intracellular protein kinase-like region and a cyclase catalytic domain. Proposed functions for the GC-C receptor are fluid and electrolyte homeostasis, the regulation of epithelial cell proliferation and the induction of apoptosis (Shalubhai 2002 Curr Opin Drug Dis Devel 5:261-268).

In addition to being expressed in the intestine by gastrointestinal epithelial cells, GC-C is expressed in extra-intestinal tissues including kidney, lung, pancreas, pituitary, adrenal, developing liver and gall bladder (reviewed in Vaandrager 2002 Mol Cell Biochem 230:73-83, Kulaksiz et al. 2004, Gastroenterology 126:732-740) and male and female reproductive tissues (reviewed in Vaandrager 2002 Mol Cell Biochem 230:73-83). This suggests that the GC-C receptor agonists can be used in the treatment of disorders outside the GI tract, for example, congestive heart failure and benign prostatic hyperplasia.

Ghrelin, a peptide hormone secreted by the stomach, is a key regulator of appetite in humans. Ghrelin expression levels are regulated by fasting and by gastric emptying (Kim et al. 2003 Neuroreprt 14:1317-20; Gualillo et al. 2003 FEBS Letts 552: 105-9). Thus, by increasing gastrointestinal motility, GC-C receptor agonists may also be used to regulate obesity.

In humans, the GC-C receptor is activated by guanylin (Gn) (U.S. 5,96,097), uroguanylin (Ugn) (U.S. 5,140,102) and lymphoguanylin (Forte et al. 1999 *Endocrinology* 140:1800-1806). Interestingly, these agents are 10-100 fold less potent than a class of bacterially derived peptides, termed ST (reviewed in Gianella 1995 J Lab Clin Med 125:173-181). ST peptides are considered super agonists of GC-C and are very resistant to proteolytic degradation.

ST peptide is capable of stimulating the enteric nervous system (Rolfe et al., 1994, J Physiolo 475: 531-537; Rolfe et al. 1999 Gut 44: 615-619; Nzegwu et al. 1996 Exp Physiol 81: 313-315). Also, cGMP has been reported to have antinociceptive effects in multiple animal models of pain (Lazaro Ibanez et al. 2001 Eur J Pharmacol 426: 39-44; Soares et al. 2001 British J Pharmacol 134: 127-131; Jain et al. 2001 Brain Res 909:170-178; Amarante et al. 2002 Eur J

Pharmacol 454:19-23). Thus, GC-C agonists may have both an analgesic as well an anti-inflammatory effect.

In bacteria, ST peptides are derived from a preproprotein that generally has at least 70 amino acids. The pre and pro regions are cleaved as part of the secretion process, and the resulting mature protein, which generally includes fewer than 20 amino acids, is biologically active.

Among the known bacterial ST peptides are: *E. coli* ST Ib (Moseley et al. 1983 Infect. Immun. 39:1167) having the mature amino acid sequence Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:__); *E. coli* ST Ia (So and McCarthy 1980 Proc. Natl. Acad. Sci. USA 77:4011) having the mature amino acid sequence Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Ala Gly Cys Tyr (SEQ ID NO:__); *E. coli* ST I* (Chan and Giannella 1981 J. Biol. Chem. 256:7744) having the mature amino acid sequence Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys Tyr Pro Ala Cys Ala Gly Cys Asn (SEQ ID NO:___); *C.freundii* ST peptide (Guarino et al. 1989b *Infect. Immun.* 57:649) having the mature amino acid sequence Asn Thr Phe Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Ala Gly Cys Tyr (SEQ ID NO:__); *Y. enterocolitica* ST peptides, Y-ST(Y-STa), Y-STb, and Y-STc (reviewed in Huang et al. 1997 Microb. Pathog. 22:89) having the following pro-form amino acid sequences: Gln Ala Cys Asp Pro Pro Ser Pro Pro Ala Glu Val Ser Ser Asp Trp Asp Cys Cys Asp Val Cys Cys Asn Pro Ala Cys Ala Gly Cys (SEQ ID NO:___) (as well as a Ser-7 to Leu-7 variant of Y-STa (SEQ ID NO:___), (Takao et al. 1985 Eur. J. Biochem. 152:199)); Lys Ala Cys Asp Thr Gln Thr Pro Ser Pro Ser Glu Glu Asn Asp Asp Trp Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Ala Gly Cys (SEQ ID NO:___); Gln Glu Thr Ala Ser Gly Gln Val Gly Asp Val Ser Ser Ser Thr Ile Ala Thr Glu Val Ser Glu Ala Glu Cys Gly Thr Gln Ser Ala Thr Thr Gln Gly Glu Asn Asp Trp Asp Trp Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Phe Gly Cys (SEQ ID NO:___), respectively; *Y. kristensenii* ST peptide having the mature amino acid sequence Ser Asp Trp Cys Cys Glu Val Cys Cys Asn Pro Ala Cys Ala Gly Cys (SEQ ID NO:___); V. *cholerae* non-01 ST peptide (Takao et al. (1985) *FEBS lett.* 193:250) having the mature amino acid sequence Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly Cys Leu Asn (SEQ ID NO:__); and *V. mimicus* ST peptide (Arita et al. 1991 FEMS Microbiol. Lett. 79:105)

having the mature amino acid sequence Ile Asp Cys Cys Glu Ile Cys Cys Asn Pro Ala Cys Phe Gly Cys Leu Asn (SEQ ID NO:__). Table I below provides sequences of all or a portion of a number of mature ST peptides. Such peptides are useful GCC agonists.

Table I

GenBank® Accession No.	**GenBank® GI No.**	**Sequence**
QHECIB	69638	NSSNYCCELCCNPACTGCY(SEQ ID NO:__)
P01559	123711	NTFYCCELCCNPACAGCY(SEQ ID NO:__)
AAA24653	147878	NTFYCCELCCNPACAPCY(SEQ ID NO:__)
P01560	123707	NTFYCCELCCYPACAGCN(SEQ ID NO:__)
AAA27561	295439	IDCCEICCNPACFGCLN(SEQ ID NO:__)
P04429	123712	IDCCEICCNPACFGCLN(SEQ ID NO:__)
S34671	421286	IDCCEICCNPACF(SEQ ID NO:__)
CAA52209	395161	IDCCEICCNPACFG(SEQ ID NO:__)
A54534	628844	IDCCEICCNPACFGCLN(SEQ ID NO:__)
AAL02159	15592919	IDRCEICCNPACFGCLN(SEQ ID NO:__)
AAA18472	487395	DWDCCDVCCNPACAGC(SEQ ID NO:__)
S25659	282047	DWDCCDVCCNPACAGC(SEQ ID NO:__)
P74977	3913874	NDDWCCEVCCNPACAGC(SEQ ID NO:__)
BAA23656	2662339	WDWCCELCCNPACFGC(SEQ ID NO:__)
P31518	399947	SDWCCEVCCNPACAGC(SEQ ID NO:__)
		QACDPPSPPAEVSSDWDCCDVCCDPAC AGC
		QACDPPSPPAEVSSDWDCCDVCCNPACAG C
		KACDTQTPSPSEENDDTCCEVCCNPACAG C
		QETASGQVGDVSSSTIATEVSEAECGTQSATTQGE NDWDWCCELCCNPACFGC
		MKKLMLAIFISVLSFPSFSQSTESLDS SKEKITLETKKCDVVKNNSEKKSEN MNNTFYCCELCCNPACAGCY

		MKKSILFIFLSVLSFSPFAQDAKPVES SKEKITLESKKCNIAKKSNKSGPESM NSSNYCCELCCNPACTGCY
		MKKIVFVLVLMLSSFGAFGQETVSG QFSDALSTPITAEVYKQACDPPLPPA EVSSDWDCCDVCCNPACAGC
		GNLIDCCEICCNPACFGCLN
		GNLIDRCEICCNPACFGCLN
		PPAEVSSDWDCCDVCCNPACAGC

The immature (including pre and pro regions) form of *E. coli* ST-1A (ST-P) protein has the sequence: mkklmlaifisvlsfpsfsqstesldsskekitletkkcdvvknnsekksenmnntfyccelccnpacagcy (SEQ ID NO:___; see GenBank® Accession No. P01559 (gi:123711). The pre sequence extends from aa 1-19. The pro sequence extends from aa 20-54. The mature protein extends from 55-72. The immature (including pre and pro regions) form of *E. coli* ST-1B (ST-H) protein has the sequence: mkksilfiflsvlsfspfaqdakpvesskekitleskkcniakksnksgpesmnssnyccelccnpactgcy (SEQ ID NO:___; see GenBank® Accession No. P07965 (gi:3915589)). The immature (including pre and pro regions) form of *Y. enterocolitica* ST protein has the sequence: mkkivfvlvlmlssfgafgqetvsgqfsdalstpitaevykqacdpplppaevssdwdccdvccnpacagc (SEQ ID NO:___; see GenBank® Accession No. S25659 (gi:282047)).

The peptides of the invention, like the bacterial ST peptides, have six Cys residues. These six Cys residues form three disulfide bonds in the mature and active form of the peptide. If the six Cys residues are identified, from the amino to carboxy terminus of the peptide, as A, B, C, D, E, and F, then the disulfide bonds form as follows: A-D, B-E, and C-F. The formation of these bonds is thought to be important for GC-C receptor binding. Certain of the peptides of the invention include a potentially functional chymotrypsin cleavage site, e.g., a Trp, Tyr or Phe located between either Cys B and Cys D or between Cys E and Cys F. Cleavage at either chymotrypsin cleavage site may reduce or eliminates the ability of the peptide to bind to the GC-C receptor.

In the human body an inactive form of chymotrypsin, chymotrypsinogen is produced in the pancreas. When this inactive enzyme reaches the small intestine it is converted to active chymotrypsin by the excision of two di-peptides. Active chymotrypsin can potentially cleave peptides at the peptide bond on the carboxy-terminal side of Trp, Tyr or Phe. The presence of active chymotrypsin in the intestinal tract can potentially lead to cleavage of certain of the peptides of the invention having an appropriately positioned functional chymotrypsin cleavage site. It is expected that chymotrypsin cleavage will moderate the action of a peptide of the invention having an appropriately positioned chymotrypsin cleavage site as the peptide passes through the intestinal tract.

Trypsinogen, like chymotrypsin, is a serine protease that is produced in the pancreas and is present in the digestive tract. The active form, trypsin, will cleave peptides having a Lys or Arg. The presence of active trypsin in the intestinal tract can lead to cleavage of certain of the peptides of the invention having an appropriately positioned functional trypsin cleavage site. It is expected that chymotrypsin cleavage will moderate the action of a peptide of the invention having an appropriately positioned trypsin cleavage site as the peptide passes through the intestinal tract.

Many gastrointestinal disorders, including IBS, are associated with abdominal or visceral pain. Certain of the peptides of the invention include analgesic or antinociceptive tags such as the carboxy-terminal sequence AspPhe immediately following a Trp, Tyr or Phe that creates a functional chymotrypsin cleavage site or following Lys or Arg that creates a functional trypsin cleavage site. Chymotrypsin in the intestinal tract can potentially cleave such peptides immediately carboxy terminal to the Trp, Phe or Tyr residue, releasing the dipeptide, AspPhe. This dipeptide has been shown to have analgesic activity in animal models (Abdikkahi et al. 2001 Fundam Clin Pharmacol 15:117-23; Nikfar et al 1997, 29:583-6; Edmundson et al 1998 Clin Pharmacol Ther 63:580-93). In this manner such peptides can treat both pain and inflammation. Other analgesic peptides can be present at the amino or carboxy terminus of the peptide (e.g., following a functional cleavage site) including: endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, and substance P.

A number of the useful peptides are based on the core sequence: Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr. To create a variant having a potentially functional chymotrypsin cleavage site capable of inactivating the peptide, either the Leu (underlined) or the Thr (underlined) can be replaced by Trp, Phe or Tyr or both the Leu and the Thr can be replaced by (independently) Trp, Phe or Tyr. To create a variant having an analgesic di-peptide, the core sequence is followed by Asp Phe. The carboxy terminal Tyr in the core sequence can allow the Asp Phe dipeptide to be released by chymotrypsin in the digestive tract. The core sequence can be optionally be preceded by Asn Ser Ser Asn Tyr or Asn.

Thus, useful variants based on the core sequence include:

Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:4)

Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:5)

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:6)

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr (SEQ ID NO:---)

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:3)

Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr (SEQ ID NO:---)

Asn Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr Asp Phe

(SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Ser Ser Asn Tyr Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Trp Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Phe Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Trp Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Arg Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

Asn Cys Cys Glu Lys Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr Asp Phe (SEQ ID NO:---)

In some cases, the peptides of the invention are produced as a prepro protein that includes the amino terminal leader sequence: mkksilfiflsvlsfspfaqdakpvesskekitleskkcniakksnksgpesmn. Where the peptide is produced by a bacterial cell, e.g., *E. coli*, the forgoing leader sequence will be cleaved and the mature peptide will be efficiently secreted from the bacterial cell. U.S.

Patent No. 5,395,490 describes vectors, expression systems and methods for the efficient production of ST peptides in bacterial cells and methods for achieving efficient secretion of mature ST peptides. The vectors, expression systems and methods described in U.S. Patent No. 5,395,490 can be used to produce the ST peptides and variant ST peptides of the present invention

Variant Peptides

The invention includes variant peptides which can include one, two, three, four, five, six, seven, eight, nine, or ten (in some embodiments fewer than 5 or fewer than 3 or 2 or fewer) amino acid substitutions and/or deletions compared to SEQ ID NOs:____ to ___. The substitution(s) can be conservative or non-conservative. The naturally-occurring amino acids can be substituted by D-isomers of any amino acid, non-natural amino acids, natural and natural amino acid analogs and other groups. A conservative amino acid substitution results in the alteration of an amino acid for a similar acting amino acid, or amino acid of like charge, polarity, or hydrophobicity. At some positions, even conservative amino acid substitutions can alter the activity of the peptide. A conservative substitution can substitute a naturally-occurring amino acid for a non-naturally-occurring amino acid. The amino acid substitutions among naturally-occurring amino acids are listed in Table II.

Table II

For Amino Acid	Code	Replace with any of
Alanine	Ala	Gly, Cys, Ser
Arginine	Arg	Lys, His
Asparagine	Asn	Asp, Glu, Gln,
Aspartic Acid	Asp	Asn, Glu, Gln
Cysteine	Cys	Met, Thr, Ser
Glutamine	Gln	Asn, Glu, Asp
Glutamic Acid	Glu	Asp, Asn, Gln
Glycine	Gly	Ala
Histidine	His	Lys, Arg
Isoleucine	Ile	Val, Leu, Met
Leucine	Leu	Val, Ile, Met
Lysine	Lys	Arg, His
Methionine	Met	Ile, Leu, Val
Phenylalanine	Phe	Tyr, His, Trp
Proline	Pro	
Serine	Ser	Thr, Cys, Ala
Threonine	Thr	Ser, Met, Val
Tryptophan	Trp	Phe, Tyr
Tyrosine	Tyr	Phe, His
Valine	Val	Leu, Ile, Met

In some circumstances it can be desirable to treat patients with a variant peptide that binds to and activates intestinal GC-C receptor, but is less active than the non-variant form the peptide. This reduced activity can arise from reduced affinity for the receptor or a reduced ability to activate the receptor once bound or reduced stability of the peptide.

Production of peptides

Useful peptides can be produced either in bacteria including, without limitation, *E. coli*, or in other existing systems for peptide or protein production (e.g., *Bacillus subtilis,* baculovirus expression systems using Drosophila Sf9 cells, yeast or filamentous fungal expression systems, mammalian cell expression systems), or they can be chemically synthesized.

If the peptide or variant peptide is to be produced in bacteria, e.g., *E. coli*, the nucleic acid molecule encoding the peptide will preferably also encode a leader sequence that permits the secretion of the mature peptide from the cell. Thus, the sequence encoding the peptide can include the pre sequence and the pro sequence of, for example, a naturally-occurring bacterial ST peptide. The secreted, mature peptide can be purified from the culture medium.

The sequence encoding a peptide of the invention is preferably inserted into a vector capable of delivering and maintaining the nucleic acid molecule in a bacterial cell. The DNA molecule may be inserted into an autonomously replicating vector (suitable vectors include, for example, pGEM3Z and pcDNA3, and derivatives thereof). The vector nucleic acid may be a bacterial or bacteriophage DNA such as bacteriophage lambda or M13 and derivatives thereof. Construction of a vector containing a nucleic acid described herein can be followed by transformation of a host cell such as a bacterium. Suitable bacterial hosts include but are not limited to, *E. coli, B. subtilis*, *Pseudomonas*, *Salmonella*. The genetic construct also includes, in addition to the encoding nucleic acid molecule, elements that allow expression, such as a promoter and regulatory sequences. The expression vectors may contain transcriptional control sequences that control transcriptional initiation, such as promoter, enhancer, operator, and repressor sequences. A variety of transcriptional control sequences are well known to those in the art. The expression vector can also include a translation regulatory sequence (e.g., an untranslated 5' sequence, an untranslated 3' sequence, or an internal ribosome entry site). The vector can be capable of autonomous replication or it can integrate into host DNA to ensure stability during peptide production.

The protein coding sequence that includes a peptide of the invention can also be fused to a nucleic acid encoding a polypeptide affinity tag, e.g., glutathione S-transferase (GST), maltose E binding protein, protein A, FLAG tag, hexa-histidine, myc tag or the influenza HA tag, in order to facilitate purification. The affinity tag or reporter fusion joins the reading frame of the peptide of interest to the reading frame of the gene encoding the affinity tag such that a translational fusion is generated. Expression of the fusion gene results in translation of a single polypeptide that includes both the peptide of interest and the affinity tag. In some instances

where affinity tags are utilized, DNA sequence encoding a protease recognition site will be fused between the reading frames for the affinity tag and the peptide of interest.

Genetic constructs and methods suitable for production of immature and mature forms of the peptides and variants of the invention in protein expression systems other than bacteria, and well known to those skilled in the art, can also be used to produce peptides in a biological system.

Mature peptides and variants thereof can be synthesized by the solid-phase chemical synthesis. For example, the peptide can be synthesized on Cyc(4-CH_2 Bxl)-OCH_2-4-(oxymethyl)-phenylacetamidomethyl resin using a double coupling program. Protecting groups must be used appropriately to create the correct disulfide bond pattern. For example, the following protecting groups can be used: t-butyloxycarbonyl (alpha-amino groups); acetamidomethyl (thiol groups of Cys residues B and E); 4-methylbenyl (thiol groups of Cys residues C and F); benzyl (y-carboxyl of glutamic acid and the hydroxyl group of threonine, if present); and bromobenzyl (phenolic group of tyrosine, if present). Coupling is effected with symmetrical anhydride of t-butoxylcarbonylamino acids or hydroxybenzotriazole ester (for asparagine or glutamine residues), and the peptide is deprotected and cleaved from the solid support in hydrogen fluoride, dimethyl sulfide, anisole, and p-thiocresol using 8/1/1/0.5 ratio (v/v/v/w) at 0°C for 60 min. After removal of hydrogen fluoride and dimethyl sulfide by reduced pressure and anisole and p-thiocresol by extraction with ethyl ether and ethyl acetate sequentially, crude peptides are extracted with a mixture of 0.5M sodium phosphate buffer, pH 8.0 and N, N-dimethylformamide using 1/1 ratio, v/v. The disulfide bond for Cys residues B and E is the formed using dimethyl sulfoxide (Tam et al. (1991) *J. Am. Chem. Soc.* 113:6657-62). The resulting peptide is the purified by reverse-phase chromatography. The disulfide bond between Cys residues C and F is formed by first dissolving the peptide in 50% acetic acid in water. Saturated iodine solution in glacial acetic acid is added (1 ml iodine solution per 100 ml solution). After incubation at room temperature for 2 days in an enclosed glass container, the solution is diluted five-fold with deionized water and extracted with ethyl ether four times for removal of unreacted iodine. After removal of the residual amount of ethyl ether by rotary

evaporation the solution of crude product is lyophilized and purified by successive reverse-phase chromatography.

Peptides can also be synthesized by many other methods including solid phase synthesis using traditional FMOC protection (i.e., coupling with DCC-HOBt and deprotection with piperdine in DMF). Cys thiol groups can be trityl protected. Treatment with TFA can be used for final deprotection of the peptide and release of the peptide from the solid-state resin. In many cases air oxidation is sufficient to achieve proper disulfide bond formation.

Intestinal GC-C receptor binding assay

The ability of peptides and other agents to bind to the intestinal GC-C receptor can be tested as follows. Cells of the T84 human colon carcinoma cell line (American Type Culture Collection (Bethesda, Md.)) are grown to confluence in 24-well culture plates with a 1:1 mixture of Ham's F12 medium and Dulbecco's modified Eagle's medium (DMEM), supplemented with 5% fetal calf serum. Cells used in the assay are typically between passages 54-60. Briefly, T84 cell monolayers in 24-well plates are washed twice with 1 ml of binding buffer (DMEM containing 0.05% bovine serum albumin and 25 mM HEPES, pH 7.2), then incubated for 30 min at 37°C in the presence of mature radioactively labeled *E. coli* ST peptide and the test material at various concentrations. The cells are then washed four times with 1 ml of DMEM and solubilized with 0.5 ml/well 1N NaOH. The level of radioactivity in the solubilized material is then determined using standard methods.

Example 1: Preparation of variant ST peptides and wild-type ST peptide

1a: Preparation of recombinant variant ST peptides and wild-type ST peptide

A variant ST peptide having the sequence Asn Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:5) was produced recombinantly and tested in an

animal model. A peptide having the sequence of the wild-type ST peptide was also created (SEQ ID NO:4).

SEQ ID NO:5 and SEQ ID NO:4 peptides were produced as preproproteins using vectors produced as follows. A sequence encoding a heat-stable enterotoxin pre-pro sequence was amplified from pGK51/pGSK51 (ATCC 67728) using oligonucleotide MO3514 (5' CACACCATATGAAGAAATCAATATTATTTATTTTTCTTTCTG 3' (SEG ID NO:)) and oligonucelotide MO3515 (5' CACACCTCGAGTTAGGTCTCCATGCTTTCAGGACCACTTTTATTAC 3' (SEQ ID NO: __)). The amplification product fragment was digested with NdeI/XhoI and ligated to the T7 expression vector, pET26b(+) (Novagen) digested with NdeI/XhoI thereby creating plasmid MB3976. The region encoding the pre-pro protein was sequenced and found to encode the amino acid sequence: mkksilfiflsvlsfspfaqdakpagsskekitleskkcnivkk**s**n**k**s**g**pesm (SEQ ID NO: __) which differs from the amino acid sequence of heat-stable enterotoxin a2 precursor (sta2; mkksilfiflsvlsfspfaqdakpagsskekitleskkcnivkknnesspesm (SEQ ID NO:___); GenBank® Accession No. Q47185, GI: 3913876) at three positions (indicated by underlining and bold text) near the C-terminus. To create expression vectors with the pre-pro sequence, complementary oligos encoding each ST peptide variant or wild-type ST peptide were annealed and cloned into the MB3976 expression vector. To create MB3984 (encoding SEQ ID NO:4 peptide (wild-type ST peptide) as a prepro protein), containing the amino acid sequence, NSSNYCCELCCNPACTGCY (SEQ ID NO:___) fused downstream of the pre-pro sequence, MB 3976 was digested with BsaI/XhoI and ligated to annealed oligos MO3621 (5' GCATGAATAGTAGCAATTACTGCTGTGAATTGTGTTGTAATCCTGCTTGTACCGGGTG CTATTAATAAC 3' (SEQ ID NO:__)) and MO3622 (5' TCGAGTTATTAATAGCACCCGGTACAAGCAGGATTACAACACAATTCACAGCAGTAA TTGCTACTATTC 3'(SEQ ID NO:__)). To create MB3985 (encoding SEQ ID NO:5 as a prepro protein) containing the following amino acid sequence, NSSNYCCEYCCNPACTGCY fused downstream of the pre-pro sequence, MB 3976 was digested with BsaI/XhoI and ligated to annealed oligos MO3529 (5' GCATGAATAGTAGCAATTACTGCTGTGAATATTGTTGTAATCCTGCTTGTACCGGGTG

CTATTAATAAC 3' (SEQ ID NO:__)) and MO3530 (5' TCGAGTTATTAATAGCACCCGGTACAAGCAGGATTACAACAATATTCACAGCAGTAA TTGCTACTATTC 3'(SEQ ID NO:__)).

The SEQ ID NO:5 peptide and the SEQ ID NO:4 peptide were produced as follows. The expression vectors were transformed into *E. coli* bacterial host BL21 λ DE3 (Invitrogen). A single colony was innoculated and grown shaking overnight at 30°C in L broth + 25 mg/l kanamycin. The overnight culture was added to 3.2 L of batch medium (Glucose 25 g/l, Caseamino Acids 5 g/l, Yeast Extract 5 g/l, KH_2PO_4 13.3 g/l, $(NH_4)_2HPO_4$ 4 g/l, $MgSO_4$-$7H_20$ 1.2 g/l, Citric Acid 1.7 g/l, EDTA 8.4 mg/l, $CoCl_2$-$6H_2O$ 2.5 mg/l, $MnCl_2$-$4H_2O$ 15 mg/l, $CuCl_2$-$4H_2O$ 1.5 mg/l, H_3BO_3 3 mg/l, Na_2MoO_4-$2H_20$ 2.5 mg/l, Zn Acetate-$2H_20$ 13 mg/l, Ferric Citrate 100 mg/l, Kanamycin 25 mg/l, Antifoam DF_20_4 1 ml/l) and fermented using the following process parameters : pH 6.7 - control with base only (28% NH_4OH), 30°C, aeration : 5 liters per minute. After the initial consumption of batch glucose (based on monitoring dissolved oxygen (DO) levels), 1.5 L of feed medium (Glucose 700 g/l, Caseamino Acids 10 g/l, Yeast Extract 10 g/l, $MgSO_4$-$7H_20$ 4 g/l, EDTA 13 mg/l, $CoCl_2$-$6H_2O$ 4 mg/l, $MnCl_2$-$4H_2O$ 23.5 mg/l, $CuCl_2$-$4H_20$ 2.5 mg/l, H_3BO_3 5 mg/l, Na_2MoO_4-$2H_20$ 4 mg/l, Zn Acetate-$2H_20$ 16 mg/l, Ferric Citrate 40 mg/l, Antifoam DF_20_4 1 ml/l) was added at a feed rate controlled to maintain 20% DO. IPTG was added to 0.2 mM 2 hours post feed start. The total run time was approximately 40-45 hours (until feed exhaustion).

Cells were collected by centrifugation at 5,000 g for 10 minutes. The cell pellet was discarded and the supernatant was passed through a 50 Kd ultrafiltration unit. The 50 Kd filtrate (0.6 liters) was loaded onto a 110 ml Q-Sepharose fast Flow column (Amersham Pharmacia, equilibrated with 20 mM Tris-HCl pH 7.5) at a flow rate of 400 ml/hour. The column was washed with six volumes of 20 mM Tris-HCl pH 7.5 and proteins were eluted with 50 mM acetic acid collecting 50 ml fractions. Fractions containing ST peptide variant or wild-type ST peptide were pooled and the solvent was removed by rotary evaporation. The dried proteins were resuspended in 10 ml of 8% acetic acid, 0.1% trifluoroacetic acid (TFA) and loaded onto a Varian Polaris C18-A column (250 X 21.2 mm 10 μm, equilibrated in the same buffer) at a

flow rate of 20 ml/min. The column was washed with 100 ml of 8% methanol, 0.1% TFA and developed with a gradient (300 ml) of 24 to 48% methanol, 0.1% TFA, collecting 5-ml fractions. Fractions containing peptide were pooled and the solvent was removed by rotary evaporation. The peptides were dissolved in 0.1%TFA and lyophilized.

The SEQ ID NO:5 peptide and SEQ ID NO:4 peptide fractions were analyzed by standard LCMS and HPLC. LCMS analysis revealed that SEQ ID NO:5 peptide is more homogeneous than SEQ ID NO: 4 peptide (see Figure 1a; note that SEQ ID NO:5 peptide exhibits fewer peaks (Panel B) than SEQ ID NO:4 peptide (Panel A)).

1b: Preparation of synthetic variant ST peptides and wild-type ST peptide

Peptides were chemically synthesized by a commercial peptide synthesis company. Varying yields of peptides were obtained depending on the efficiency of chemical synthesis. Thus, the four peptides, in decreasing order of yield were: Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:3), 10-20% yield; Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:6); Asn Ser Ser Asn Tyr Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:5); Asn Ser Ser Asn Tyr Cys Cys Glu Leu Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:SEQ ID NO:4), <5% yield. Thus the specific amino acid changes introduced into the peptides can create improved manufacturing properties.

Figure 1b shows the total ion chromatograph profile of synthetically manufacturedSEQ ID NO:3 peptide. Figure 1c shows the total ion chromatograph profile of the control blank sample. There is one major peak present in the SEQ ID NO:3 peptide sample that is not also present in the control sample. Quantitative analysis suggests the SEQ ID NO:3 peptide is >98% pure.

Example 2: Activation of the intestinal GC-C receptor by a variant ST peptide and ST peptide

The ability of SEQ ID NO:5 , SEQ ID NO:4, and SEQ ID NO:3 to activate the intestinal GC-C receptor was assessed in an assay employing the T84 human colon carcinoma cell line (American Type Culture Collection (Bethesda, Md)). For the assays cells were grown to confluency in 24-well culture plates with a 1:1 mixture of Ham's F12 medium and Dulbecco's modified Eagle's medium (DMEM), supplemented with 5% fetal calf serum and were used at between passages 54 and 60.

Briefly, monolayers of T84 cells in 24-well plates were washed twice with 1 ml/well DMEM, then incubated at 37°C for 10 min with 0.45 ml DMEM containing 1 mM isobutylmethylxanthine (IBMX), a cyclic nucleotide phosphodiesterase inhibitor. Test peptides (50µl) were then added and incubated for 30 minutes at 37°C. The media was aspirated and the reaction was then terminated by the addition of ice cold 0.5 ml of 0.1N HCl. The samples were held on ice for 20 minutes and then evaporated to dryness using a heat gun or vacuum centrifugation. The dried samples were resuspended in 0.5ml of phosphate buffer provided in the Cayman Chemical Cyclic GMP EIA kit (Cayman Chemical, Ann Arbor, MI). Cyclic GMP was measured by EIA according to procedures outlined in the Cayman Chemical Cyclic GMP EIA kit.

Figure 2 shows the activity of chemically synthesized peptide variants in this GC-C receptor activity assay. In this assay, SEQ ID NO:4 and two different SEQ ID NO:3 peptides (SEQ ID NO:3(a) and SEQ ID NO:3(b), synthesized by two different methods) had activity comparable to SEQ ID NO:4. SEQ ID NO:5 and SEQ ID NO:4 peptide were chemically synthesized in a manner identical to that of SEQ ID NO:3(b).

Example 3: SEQ ID NO:5 and SEQ ID NO:4 increase intestinal transit in mice

In order to determine whether the peptides increase the rate of gastrointestinal transit, the peptides and controls were tested using a murine gastrointestinal transit (GIT) assay (Moon et al. *Infection and Immunity* 25:127, 1979). In this assay, charcoal, which can be readily visualized in the gastrointestinal tract is administered to mice after the administration of a test compound. The distance traveled by the charcoal is measured and expressed as a percentage of the total length of the colon.

Mice were fasted with free access to water for 12 to 16 hours before the treatment with peptide or control buffer. The peptides were orally administered at 1μg/kg – 1mg/kg of peptide in buffer (20mM Tris pH 7.5) 7 minutes before being given an oral dose of 5% Activated Carbon (Aldrich 242276-250G). Control mice were administered buffer only before being given a dose of Activated Carbon. After 15 minutes, the mice were sacrificed and their intestines from the stomach to the cecum were dissected. The total length of the intestine as well as the distance traveled from the stomach to the charcoal front was measured for each animal and the results are expressed as the percent of the total length of the intestine traveled by the charcoal front. All results are reported as the average of 10 mice ± standard deviation. A comparison of the distance traveled by the charcoal between the mice treated with peptide versus the mice treated with vehicle alone was performed using a Student's t test and a statistically significant difference was considered for $P<0.05$. P-values are calculated using a two-sided T-Test assuming unequal variances.

As can be seen in Figure 3a and Figure 3b, wild-type ST peptide (SEQ ID NO:4, (Sigma-Aldrich, St Louis, MO); 0.1 mg/kg), synthetically manufactured SEQ ID NO:3 and Zelnorm® (0.1 mg/kg), a drug approved for IBS that is an agonist for the serotonin receptor 5HT4, increase gastrointestinal transit rate in this model. Figure 4a shows the result of a study demonstrating that intestinal transit rate increases with an increasing dosage of either recombinantly synthesized SEQ ID NO:4 or SEQ ID NO:5. Figure 4b shows the results of a

study demonstrating both chemically synthesized SEQ ID NO:4 or SEQ ID NO:3 peptide increase intestinal transit rates more than either Tris buffer alone or an equivalent dose of Zelnorm®.

The identical experiment was performed to determine if SEQ ID NO:3 is effective in a chronic dosing treatment regimen. Briefly, 8 week old CD1 female mice are dosed orally once a day for 5 days with either SEQ ID NO:3 (0.06mg/kg or 0.25mg/kg in 20mM Tris pH 7.5) or vehicle alone (20mM Tris pH 7.5). On the 5th day, a GIT assay is performed identical to that above except 200µl of a 10% charcoal solution is administered. Figure 4c shows the results of a study demonstrating both chemically synthesized SEQ ID NO:3 or Zelnorm® are effective in a mouse gastrointestinal motility assay upon chronic dosing (daily for 5 days). The results are shown side by side with acute dosing (1 day).

Example 4: SEQ ID NO:5 peptide and SEQ ID NO:4 peptide increase intestinal secretion in suckling mice (SuMi assay)

SEQ ID NO:4 peptide and SEQ ID NO:5 were tested for their ability to increase intestinal secretion using a suckling mouse model of intestinal secretion. In this model a test compound is administered to suckling mice that are between 7 and 9 days old. After the mice are sacrificed, the gastrointestinal tract from the stomach to the cecum is dissected ("guts"). The remains ("carcass") as well as the guts are weighed and the ratio of guts to carcass weight is calculated. If the ratio is above 0.09, one can conclude that the test compound increases intestinal secretion. Figure 5a shows a dose response curve for wild-type ST peptide (SEQ ID NO:4) in this model. Figure 5b shows dose response curve for the SEQ ID NO:3 peptide in this model. These data show that wild-type ST peptide (purchased from TDT, Inc. West Chester, PA) and the SEQ ID NO:3 peptide increase intestinal secretion. The effect of Zelnorm® was also studied. As can be seen from Figure 5, Zelnorm® at 0.2 mg/kg does not increase intestinal secretion in this model. Figure 6a shows a dose response curve for the recombinant SEQ ID NO:4 peptide described above and the recombinant SEQ ID NO:5 peptide described above. As can be seen from Figure 6a, both peptides increase intestinal secretion in this model.

Similarly figure 6b shows a dose response curve for chemically synthesized SEQ ID NO:5, SEQ ID NO:3 and SEQ ID NO:4 as well as wild-type ST peptide (purchased from Sigma-Aldrich, St Louis, MO).

Colonic hyperalgesia animal models

Hypersensitivity to colorectal distension is common in patients with IBS and may be responsible for the major symptom of pain. Both inflammatory and non-inflammatory animal models of visceral hyperalgesia to distension have been developed to investigate the effect of compounds on visceral pain in IBS.

I. Trinitrobenzenesulphonic acid (TNBS)-induced rectal allodynia model

Male Wistar rats (220-250 g) were premedicated with 0.5 mg/kg of acepromazine injected intraperitoneally (IP) and anesthetized by intramuscular administration of 100 mg/kg of ketamine. Pairs of nichrome wire electrodes (60 cm in length and 80 μm in diameter) were implanted in the striated muscle of the abdomen, 2 cm laterally from the white line. The free ends of electrodes were exteriorized on the back of the neck and protected by a plastic tube attached to the skin. Electromyographic (EMG) recordings were started 5 days after surgery. Electrical activity of abdominal striated muscle was recorded with an electroencephalograph machine (Mini VIII, Alvar, Paris, France) using a short time constant (0.03 sec.) to remove low-frequency signals (<3 Hz).

Ten days post surgical implantation, trinitrobenzenesulphonic acid (TNBS) was administered to induce rectal inflammation. TNBS (80 mg kg^{-1} in 0.3 ml 50 % ethanol) was administered intrarectally through a silicone rubber catheter introduced at 3 cm from the anus under light diethyl-ether anesthesia, as described (Morteau et al. 1994 Dig Dis Sci 39:1239). Following TNBS administration, rats were placed in plastic tunnels where they were severely limited in mobility for several days before colorectal distension (CRD). Experimental compound was administered one hour before CRD which was performed by insertion into the rectum, at 1 cm of the anus, a 4 cm long balloon made from a latex condom (Gue et al, 1997

Neurogastroenterol. Motil. 9:271). The balloon was fixed on a rigid catheter taken from an embolectomy probe (Fogarty). The catheter attached balloon was fixed at the base of the tail. The balloon, connected to a barostat, was inflated progressively by step of 15 mmHg, from 0 to 60 mmHg, each step of inflation lasting 5 min. Evaluation of rectal sensitivity, as measured by EMG, was performed before (1-2 days) and 3 days following rectal instillation of TNBS.

The number of spike bursts that corresponds to abdominal contractions was determined per 5 min periods. Statistical analysis of the number of abdominal contractions and evaluation of the dose-effects relationships was performed by a one way analysis of variance (ANOVA) followed by a post-hoc (Student or Dunnett tests) and regression analysis for ED50 if appropriate.

Figure 7 shows the results of experiment in which SEQ ID NO:3 activity was analyzed in the TNBS colorectal model. Significant decreases in abdominal response are observed at 0.3 μg/kg and 3 μg/kg SEQ ID NO:3. These results demonstrate that SEQ ID NO:3 reduces pain associated with colorectal distension in this animal model.

II. Stress-induced hyperalgesia model

Male Wistar Rats (200-250 g) are surgically implanted with nichrome wire electrodes as in the TNBS model. Ten days post surgical implantation, partial restraint stress (PRS), is performed as described by Williams et al. for two hours (Williams et al. 1988 Gastroenterology 64:611). Briefly, under light anesthesia with ethyl-ether, the foreshoulders, upper forelimbs and thoracic trunk are wrapped in a confining harness of paper tape to restrict, but not prevent body movements. Control sham-stress animals are anaesthetized but not wrapped. Thirty minutes before the end of the PRS session, the animals are administered test-compound or vehicle. Thirty minutes to one hour after PRS completion, the CRD distension procedure is performed as described above for the TNBS model with barostat at pressures of 15, 30, 45 and 60mm Hg. Statistical analysis on the number of bursts is determined and analyzed as in the TNBS model above.

Phenylbenzoquinone-induced writhing model

The PBQ-induced writhing model can be used to assess pain control activity of the peptides and GC-C receptor agonists of the invention. This model is described by Siegmund et al. (1957 Proc. Soc. Exp. Bio. Med. 95:729-731). Briefly, one hour after oral dosing with a test compound, e.g., a peptide, morphine or vehicle, 0.02% phenylbenzoquinone (PBQ) solution (12.5 mL/kg) is injected by intraperitoneal route into the mouse. The number of stretches and writhings are recorded from the 5^{th} to the 10^{th} minute after PBQ injection, and can also be counted between the 35^{th} and 40^{th} minute and between the 60^{th} and 65^{th} minute to provide a kinetic assessment. The results are expressed as the number of stretches and writhings (mean ± SEM) and the percentage of variation of the nociceptive threshold calculated from the mean value of the vehicle-treated group. The statistical significance of any differences between the treated groups and the control group is determined by a Dunnett's test using the residual variance after a one-way analysis of variance ($P< 0.05$) using SigmaStat Software.

Figures 8a and 8b show the effect of different doses of SEQ ID NO:5 and SEQ ID NO:3 in the PBQ writhing assay. Indomethacin, an NSAID (nonsteroidal anti-inflammatory drug) with known pain control activity, was used as the positive control in the assay. Significant reductions in writhings were observed for SEQ ID NO:5 (1 mg/kg dose) and SEQ ID NO:3 (2.5 mg/kg dose) compared to the vehicle control. Loss of efficacy at the highest dose tested has also been observed for multiple other compounds (such as 5HT-3 antagonists) tested in similar assays. The results of this study suggest that both SEQ ID NO:5 and SEQ ID NO:3 have antinociceptive effects in this visceral pain model comparable to the intermediate doses of indomethacin.

Example 5: SEQ ID NO:3 Kd determination

To determine the affinity of SEQ ID NO:3 for GC-C receptors found in rat intestinal mucosa, a competition binding assay was performed using rate intestinal epithelial cells. Epithelial cells from the small intestine of rats were obtained as described by Kessler et al. (*J. Biol. Chem.*

245: 5281-5288 (1970)). Briefly, animals were sacrificed and their abdominal cavities exposed. The small intestine was rinsed with 300 ml ice cold saline or PBS. 10 cm of the small intestine measured at 10 cm from the pylorus was removed and cut into 1 inch segments. Intestinal mucosa was extruded from the intestine by gentle pressure between a piece of parafilm and a P-1000 pipette tip. Intestinal epithelial cells were placed in 2 ml PBS and pipetted up and down with a 5 ml pipette to make a suspension of cells. Protein concentration in the suspension was measured using the Bradford method (*Anal. Biochem.* 72: 248-254 (1976)).

A competition binding assay was performed based on the method of Giannella et al. (*Am. J. Physiol.* 245: G492-G498) between [^{125}I] labeled SEQ ID NO:4 and SEQ ID NO:3. The assay mixture contained: 0.5 ml of DME with 20 mM HEPES-KOH pH 7.0, 0.9 mg of the cell suspension listed above, 21.4 fmol [^{125}I]-SEQ ID NO:4 (42.8 pM), and different concentrations of competitor SEQ ID NO:3 (0.01 to 1000 nM). The mixture was incubated at room temperature for 1 hour, and the reaction stopped by applying the mixture to GF/B glass-fiber filters (Whatman). The filters were washed with 5 ml ice-cold PBS and radioactivity was measured. Figure 9 shows that the Kd for SEQ ID NO:3 in this assay is 4.5 nm. %B/Bo is the percentage of the ratio of radioactivity trapped in each sample (B) compared to the radioactivity retained in a control sample with no cold competitor (Bo). Giannella et al. (*Am. J. Physiol.*245: G492-G498) observed that the Kd for wild-type ST peptide in this same assay was ~13 nm.

Example 6: Pharmacokinetic properties of SEQ ID NO:3

To study the pharmacokinetics of SEQ ID NO:3, absorbability studies in mice were performed by administering SEQ ID NO:3 intravaneously via tail vein injection or orally by gavage to 8-week-old CD1 mice. Serum was collected from the animals at various time points and tested for the presence of SEQ ID NO:3 using a competitive enzyme-linked immunoabsorbent assay (Oxoid, ST EIA kit, Cat#TD0700). The assay utilized monoclonal antibodies against ST peptide (antibodies are provided in the Oxoid kit) and synthetically manufactured SEQ ID NO:3. Figure 10a shows absorption data for intravenously and orally administered SEQ ID

NO:3 as detected by the ELISA assay. SEQ ID NO:3 appears to be minimally systemically absorbed and is < 2.2% bioavailable.

A similar bioavailability study was performed in which LCMS rather than ELISA was used to detect SEQ ID NO:3. Initially, serum samples were extracted from the whole blood of exposed and control mice, then injected directly (10mL) onto an in-line solid phase extraction (SPE) column (Waters Oasis HLB 25mm column, 2.0 x 15mm direct connect) without further processing. The sample on the SPE column was washed with a 5% methanol, 95% dH_2O solution (2.1 mL/min, 1.0 minute), then loaded onto an analytical column using a valve switch that places the SPE column in an inverted flow path onto the analytical column (Waters Xterra MS C8 5mm IS column, 2.1 x 20mm). The sample was eluted from the analytical column with a reverse phase gradient (Mobile Phase A: 10 mM ammonium hydroxide in dH_2O, Mobile Phase B: 10 mM ammonium hydroxide in 80% acetonitrile and 20% methanol; 20% B for the first 3 minutes then ramping to 95% B over 4 min. and holding for 2 min., all at a flow rate of 0.4 mL/min.). At 9.1 minutes, the gradient returns to the initial conditions of 20%B for 1 min. SEQ ID NO:3 eluted from the analytical column at 1.45 minutes, and was detected by triple-quadrapole mass spectrometry (MRM, 764 (+2 charge state)>182 (+1 charge state) Da; cone voltage = 30V; collision = 20 eV; parent resolution = 2 Da at base peak; daughter resolution = 2 Da at base peak). Instrument response was converted into concentration units by comparison with a standard curve using known amounts of chemically synthesized SEQ ID NO:3 prepared and injected in mouse serum using the same procedure.

Figure 10b shows absorption data for IV and orally administered SEQ ID NO:3 as detected by LCMS. In this assay, SEQ ID NO:3 appears similarly minimally systemically absorbed and is < 0.11 % bioavailable.

Administration of peptides and GC-C receptor agonists

For treatment of gastrointestinal disorders, the peptides and agonists of the invention are preferably administered orally, e.g., as a tablet or cachet containing a predetermined amount of

the active ingredient, pellet, gel, paste, syrup, bolus, electuary, slurry, sachet; capsule; powder; lyophilized powder; granules; as a solution or a suspension in an aqueous liquid or a non-aqueous liquid; as an oil-in-water liquid emulsion or a water-in-oil liquid emulsion, via a liposomal formulation (see, e.g., EP 736299) or in some other form. Orally administered compositions can include binders, lubricants, inert diluents, lubricating, surface active or dispersing agents, flavoring agents, and humectants. Orally administered formulations such as tablets may optionally be coated or scored and may be formulated so as to provide sustained, delayed or controlled release of the active ingredient therein. The peptides and agonists can be co-administered with other agents used to treat gastrointestinal disorders including but not limited to the agents described herein. The peptides and agonists can also be administered by rectal suppository. For the treatment of disorders outside the gastrointestinal tract such as congestive heart failure and benign prostatic hypertrophy, peptides and agonists are preferably administered parenterally or orally.

The peptides described herein can be administered alone or in combination with other agents. For example, the peptides can be administered together with an analgesic peptide or compound. The analgesic peptide or compound can be covalently attached to a peptide described herein or it can be a separate agent that is administered together with or sequentially with a peptide described herein in a combination therapy.

Combination therapy can be achieved by administering two or more agents, e.g., a peptide described herein and an analgesic peptide or compound, each of which is formulated and administered separately, or by administering two or more agents in a single formulation. Other combinations are also encompassed by combination therapy. For example, two agents can be formulated together and administered in conjunction with a separate formulation containing a third agent. While the two or more agents in the combination therapy can be administered simultaneously, they need not be. For example, administration of a first agent (or combination of agents) can precede administration of a second agent (or combination of agents) by minutes, hours, days, or weeks. Thus, the two or more agents can be administered within minutes of each other or within 1, 2, 3, 6, 9, 12, 15, 18, or 24 hours of each other or within 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14 days of each other or within 2, 3, 4, 5, 6, 7, 8, 9, or 10 weeks of each other.

In some cases even longer intervals are possible. While in many cases it is desirable that the two or more agents used in a combination therapy be present in within the patient's body at the same time, this need not be so.

Combination therapy can also include two or more administrations of one or more of the agents used in the combination. For example, if agent X and agent Y are used in a combination, one could administer them sequentially in any combination one or more times, e.g., in the order X-Y-X, X-X-Y, Y-X-Y, Y-Y-X, X-X-Y-Y, etc.

The agents, alone or in combination, can be combined with any pharmaceutically acceptable carrier or medium. Thus, they can be combined with materials that do not produce an adverse, allergic or otherwise unwanted reaction when administered to a patient. The carriers or mediums used can include solvents, dispersants, coatings, absorption promoting agents, controlled release agents, and one or more inert excipients (which include starches, polyols, granulating agents, microcrystalline cellulose, diluents, lubricants, binders, disintegrating agents, and the like), etc. If desired, tablet dosages of the disclosed compositions may be coated by standard aqueous or nonaqueous techniques.

Compositions of the present invention may also optionally include other therapeutic ingredients, anti-caking agents, preservatives, sweetening agents, colorants, flavors, desiccants, plasticizers, dyes, and the like. Any such optional ingredient must be compatible with the compound of the invention to insure the stability of the formulation.
The composition may contain other additives as needed, including for exanple lactose, glucose, fructose, galactose, trehalose, sucrose, maltose, raffinose, maltitol, melezitose, stachyose, lactitol, palatinite, starch, xylitol, mannitol, myoinositol, and the like, and hydrates thereof, and amino acids, for example alanine, glycine and betaine, and peptides and proteins, for example albumen.

Examples of excipients for use as the pharmaceutically acceptable carriers and the pharmaceutically acceptable inert carriers and the aforementioned additional ingredients include, but are not limited to binders, fillers, disintegrants, lubricants, anti-microbial agents,

and coating agents such as:

BINDERS: corn starch, potato starch, other starches, gelatin, natural and synthetic gums such as acacia, sodium alginate, alginic acid, other alginates, powdered tragacanth, guar gum, cellulose and its derivatives (*e.g.*, ethyl cellulose, cellulose acetate, carboxymethyl cellulose calcium, sodium carboxymethyl cellulose), polyvinyl pyrrolidone, methyl cellulose, pre-gelatinized starch (*e.g.*, STARCH 1500® and STARCH 1500 LM®, sold by Colorcon, Ltd.), hydroxypropyl methyl cellulose, microcrystalline cellulose (*e.g.* AVICEL™, such as, AVICEL-PH-101™, -103™ and -105™, sold by FMC Corporation, Marcus Hook, PA, USA), or mixtures thereof,

FILLERS: talc, calcium carbonate (*e.g.*, granules or powder), dibasic calcium phosphate, tribasic calcium phosphate, calcium sulfate (*e.g.*, granules or powder), microcrystalline cellulose, powdered cellulose, dextrates, kaolin, mannitol, silicic acid, sorbitol, starch, pre-gelatinized starch, or mixtures thereof,

DISINTEGRANTS: agar-agar, alginic acid, calcium carbonate, microcrystalline cellulose, croscarmellose sodium, crospovidone, polacrilin potassium, sodium starch glycolate, potato or tapioca starch, other starches, pre-gelatinized starch, clays, other algins, other celluloses, gums, or mixtures thereof,

LUBRICANTS: calcium stearate, magnesium stearate, mineral oil, light mineral oil, glycerin, sorbitol, mannitol, polyethylene glycol, other glycols, stearic acid, sodium lauryl sulfate, talc, hydrogenated vegetable oil (*e.g.*, peanut oil, cottonseed oil, sunflower oil, sesame oil, olive oil, corn oil and soybean oil), zinc stearate, ethyl oleate, ethyl laurate, agar, syloid silica gel (AEROSIL 200, W.R. Grace Co., Baltimore, MD USA), a coagulated aerosol of synthetic silica (Deaussa Co., Plano, TX USA), a pyrogenic silicon dioxide (CAB-O-SIL, Cabot Co., Boston, MA USA), or mixtures thereof,

ANTI-CAKING AGENTS: calcium silicate, magnesium silicate, silicon dioxide, colloidal

silicon dioxide, talc, or mixtures thereof,

ANTIMICROBIAL AGENTS: benzalkonium chloride, benzethonium chloride, benzoic acid, benzyl alcohol, butyl paraben, cetylpyridinium chloride, cresol, chlorobutanol, dehydroacetic acid, ethylparaben, methylparaben, phenol, phenylethyl alcohol, phenoxyethanol, phenylmercuric acetate, phenylmercuric nitrate, potassium sorbate, propylparaben, sodium benzoate, sodium dehydroacetate, sodium propionate, sorbic acid, thimersol, thymo, or mixtures thereof, and

COATING AGENTS: sodium carboxymethyl cellulose, cellulose acetate phthalate, ethylcellulose, gelatin, pharmaceutical glaze, hydroxypropyl cellulose, hydroxypropyl methylcellulose, hydroxypropyl methyl cellulose phthalate, methylcellulose, polyethylene glycol, polyvinyl acetate phthalate, shellac, sucrose, titanium dioxide, carnauba wax, microcrystalline wax, or mixtures thereof.

The agents either in their free form or as a salt can be combined with a polymer such as polylactic-glycoloic acid (PLGA), poly-(D)-lactic-glycolic-tartaric acid (P(D)LGT) (WO 01/12233), polyglycolic acid (U.S. 3,773,919), polylactic acid (U.S. 4,767,628), poly(ε-caprolactone) and poly(alkylene oxide) (U.S. 20030068384) to create a sustained release formulation. Such formulations can be used to implants that release a peptide or another agent over a period of a few days, a few weeks or several months depending on the polymer, the particle size of the polymer, and the size of the implant (see, e.g., U.S. 6,620,422). Other sustained release formulations and polymers for use in are described in EP 0 467 389 A2, WO 93/24150, U.S. 5,612,052, WO 97/40085, WO 03/075887, WO 01/01964A2, U.S. 5,922,356, WO 94/155587, WO 02/074247A2, WO 98/25642, U.S. 5,968,895, U.S. 6,180,608, U.S. 20030171296, U.S. 20020176841, U.S. 5,672,659, U.S. 5,893,985, U.S. 5,134,122, U.S. 5,192,741, U.S. 5,192,741, U.S. 4,668,506, U.S. 4,713,244, U.S. 5,445,832 U.S. 4,931,279, U.S. 5,980,945, WO 02/058672, WO 9726015, WO 97/04744, and. US20020019446. In such sustained release formulations microparticles of peptide are combined with microparticles of polymer. One or more sustained release implants can be placed in the large intestine, the small

intestine or both. U.S. 6,011,011 and WO 94/06452 describe a sustained release formulation providing either polyethylene glycols (i.e. PEG 300 and PEG 400) or triacetin. WO 03/053401 describes a formulation which may both enhance bioavailability and provide controlled releaseof the agent within the GI tract. Additional controlled release formulations are described in WO 02/38129, EP 326 151, U.S. 5,236,704, WO 02/30398, WO 98/13029; U.S. 20030064105, U.S. 20030138488A1, U.S. 20030216307A1, U.S. 6,667,060, WO 01/49249, WO 01/49311, WO 01/49249, WO 01/49311, and U.S. 5,877,224.

The agents can be administered, e.g., by intravenous injection, intramuscular injection, subcutaneous injection, intraperitoneal injection, topical, sublingual, intraarticular (in the joints), intradermal, buccal, ophthalmic (including intraocular), intranasaly (including using a cannula), intraspinally, intrathecally, or by other routes. The agents can be administered orally, e.g., as a tablet or cachet containing a predetermined amount of the active ingredient, gel, pellet, paste, syrup, bolus, electuary, slurry, capsule, powder, lyophilized powder, granules, sachet, as a solution or a suspension in an aqueous liquid or a non-aqueous liquid, as an oil-in-water liquid emulsion or a water-in-oil liquid emulsion, via a micellar formulation (see, e.g. WO 97/11682) via a liposomal formulation (see, e.g., EP 736299,WO 99/59550 and WO 97/13500), via formulations described in WO 03/094886 or in some other form. Orally administered compositions can include binders, lubricants, inert diluents, lubricating, surface active or dispersing agents, flavoring agents, and humectants. Orally administered formulations such as tablets may optionally be coated or scored and may be formulated so as to provide sustained, delayed or controlled release of the active ingredient therein. The agents can also be administered transdermally (i.e. via reservoir-type or matrix-type patches, microneedles, thermal poration, hypodermic needles, iontophoresis, electroporation, ultrasound or other forms of sonophoresis, jet injection, or a combination of any of the preceding methods (Prausnitz et al. 2004, Nature Reviews Drug Discovery 3:115-124)). The agents can be administered using high-velocity transdermal particle injection techniques using the hydrogel particle formulation described in U.S. 20020061336. Additional particle formulations are described in WO 00/45792, WO 00/53160, and WO 02/19989. An example of a transdermal formulation containing plaster and the absorption promoter dimethylisosorbide can be found in

WO 89/04179. WO 96/11705 provides formulations suitable for transdermal adminisitration. The agents can be administered in the form a suppository or by other vaginal or rectal means. The agents can be administered in a transmembrane formulation as described in WO 90/07923. The agents can be administed non-invasively via the dehydrated particicles described in U.S. 6,485,706. The agent can be administered in an enteric-coated drug formulation as described in WO 02/49621. The agents can be administered intranassaly using the formulation described in U.S. 5,179,079. Formulations suitable for parenteral injection are described in WO 00/62759. The agents can be administered using the casein formulation described in U. S. 20030206939 and WO 00/06108. The agents can be administered using the particulate formulations described in U.S. 20020034536.

The agents, alone or in combination with other suitable components, can be administered by pulmonary route utilizing several techniques including but not limited to intratracheal instillation (delivery of solution into the lungs by syringe), intratracheal delivery of liposomes, insufflation (administration of powder formulation by syringe or any other similar device into the lungs) and aerosol inhalation. Aerosols (e.g., jet or ultrasonic nebulizers, metered-dose inhalers (MDIs), and dry-powder inhalers (DPIs)) can also be used in intranasal applications. Aerosol formulations are stable dispersions or suspensions of solid material and liquid droplets in a gaseous medium and can be placed into pressurized acceptable propellants, such as hydrofluroalkanes (HFAs, i.e. HFA-134a and HFA-227, or a mixture thereof), dichlorodifluoromethane (or other chlorofluocarbon propellants such as a mixture of Propellants 11, 12, and/or 114), propane, nitrogen, and the like. Pulmonary formulations may include permeation enhancers such as fatty acids, and saccharides, chelating agents, enzyme inhibitors (e.g., protease inhibitors), adjuvants (e.g., glycocholate, surfactin, span 85, and nafamostat), preservatives (e.g., benzalkonium chloride or chlorobutanol), and ethanol (normally up to 5% but possibly up to 20%, by weight). Ethanol is commonly included in aerosol compositions as it can improve the function of the metering valve and in some cases also improve the stability of the dispersion. Pulmonary formulations may also include surfactants which include but are not limited to bile salts and those described in U.S. 6,524,557 and references therein. The surfactants described in U.S. 6,524,557, e.g., a C8-C16 fatty acid

salt, a bile salt, a phospholipid, or alkyl saccaride are advantageous in that some of them also reportedly enhance absorption of the peptide in the formulation. Also suitable in the invention are dry powder formulations comprising a therapeutically effective amount of active compound blended with an appropriate carrier and adapted for use in connection with a dry-powder inhaler. Absorption enhancers which can be added to dry powder formulations of the present invention include those described in U.S. 6,632,456. WO 02/080884 describes new methods for the surface modification of powders. Aerosol formulations may include U.S. 5,230,884, U.S. 5,292,499, WO 017/8694, WO 01/78696, U.S. 2003019437, U. S. 20030165436, and WO 96/40089 (which includes vegetable oil). Sustained release formulations suitable for inhalation are described in U.S. 20010036481A1, 20030232019A1, and U.S. 20040018243A1 as well as in WO 01/13891, WO 02/067902, WO 03/072080, and WO 03/079885. Pulmonary formulations containing microparticles are described in WO 03/015750, U.S. 20030008013, and WO 00/00176. Pulmonary formulations containing stable glassy state powder are described in U.S. 20020141945 and U.S. 6,309,671. Other aerosol formulations are desribed in EP 1338272A1 WO 90/09781, U. S. 5,348,730, U.S. 6,436,367, WO 91/04011, and U.S. 6,294,153 and U.S. 6,290,987 describes a liposomal based formulation that can be administered via aerosol or other means. Powder formulations for inhalation are described in U.S. 20030053960 and WO 01/60341. The agents can be administered intranasally as described in U.S. 20010038824.

Solutions of medicament in buffered saline and similar vehicles are commonly employed to generate an aerosol in a nebulizer. Simple nebulizers operate on Bernoulli's principle and employ a stream of air or oxygen to generate the spray particles. More complex nebulizers employ ultrasound to create the spray particles. Both types are well known in the art and are described in standard textbooks of pharmacy such as Sprowls' American Pharmacy and Remington's The Science and Practice of Pharmacy. Other devices for generating aerosols employ compressed gases, usually hydrofluorocarbons and chlorofluorocarbons, which are mixed with the medicament and any necessary excipients in a pressurized container, these devices are likewise described in standard textbooks such as Sprowls and Remington.

The agents can be a free acid or base, or a pharmacologically acceptable salt thereof. Solids can be dissolved or dispersed immediately prior to administration or earlier. In some circumstances the preparations include a preservative to prevent the growth of microorganisms. The pharmaceutical forms suitable for injection can include sterile aqueous or organic solutions or dispersions which include, e.g., water, an alcohol, an organic solvent, an oil or other solvent or dispersant (e.g., glycerol, propylene glycol, polyethylene glycol, and vegetable oils). The formulations may contain antioxidants, buffers, bacteriostats, and solutes that render the formulation isotonic with the blood of the intended recipient, and aqueous and non-aqueous sterile suspensions that can include suspending agents, solubilizers, thickening agents, stabilizers, and preservatives. Pharmaceutical agents can be sterilized by filter sterilization or by other suitable means. The agent can be fused to immunoglobulins or albumin, or incorporated into a lipsome to improve half-life. The agent can also be conjugated to polyethylene glycol (PEG) chains. Methods for pegylation and additional formulations containing PEG-conjugates (i.e. PEG-based hydrogels, PEG modified liposomes) can be found in Harris and Chess, Nature Reviews Drug Discovery 2: 214-221 and the references therein. Peptides can also be modified with alkyl groups (e.g., C1-C20 straight or branched alkyl groups); fatty acid radicals; and combinations of PEG, alkyl groups and fatty acid radicals (see U.S. Patent 6,309,633; Soltero et al., 2001 Innovations in Pharmaceutical Technology 106-110). The agent can be administered via a nanocochleate or cochleate delivery vehicle (BioDelivery Sciences International). The agents can be delivered transmucosally (i.e. across a mucosal surface such as the vagina, eye or nose) using formulations such as that described in U.S. 5,204,108. The agents can be formulated in microcapsules as described in WO 88/01165. The agent can be administered intra-orally using the formulations described in U.S. 20020055496, WO 00/47203, and U.S. 6,495,120. The agent can be delivered using nanoemulsion formulations described in WO 01/91728A2.

Suitable pharmaceutical compositions in accordance with the invention will generally include an amount of the active compound(s) with an acceptable pharmaceutical diluent or excipient, such as a sterile aqueous solution, to give a range of final concentrations, depending on the

intended use. The techniques of preparation are generally well known in the art, as exemplified by Remington's Pharmaceutical Sciences (18th Edition, Mack Publishing Company, 1995).

The agents described herein and combination therapy agents can be packaged as a kit that includes single or multiple doses of two or more agents, each packaged or formulated individually, or single or multiple doses of two or more agents packaged or formulated in combination. Thus, one or more agents can be present in first container, and the kit can optionally include one or more agents in a second container. The container or containers are placed within a package, and the package can optionally include administration or dosage instructions. A kit can include additional components such as syringes or other means for administering the agents as well as diluents or other means for formulation.

Methods to increase chemical and/or physical stability of the agents the described herein are found in U.S. 6,541,606, U.S. 6,068,850, U.S. 6,124,261, U.S. 5,904,935, and WO 00/15224, U.S. 20030069182 (via the additon of nicotinamide), U.S. 20030175230A1, U.S. 20030175230A1, U.S. 20030175239A1, U.S. 20020045582, U.S. 20010031726, WO 02/26248, WO 03/014304, WO 98/00152A1, WO 98/00157A1, WO 90/12029, WO 00/04880, and WO 91/04743, WO 97/04796 and the references cited therein.

Methods to increase bioavailability of the agents described herein are found in U.S. 6,008,187, U.S. 5,424,289, U.S. 20030198619, WO 90/01329, WO 01/49268, WO 00/32172, and WO 02/064166. Glycyrrhizinate can also be used as an absorption enhancer (see, e.g., EP397447). WO 03/004062 discusses Ulex europaeus I (UEAl) and UEAI mimetics which may be used to target the agents of the invention to the GI tract.

The agents described herein can be fused to a modified version of the blood serum protein transferrin. U.S. 20030221201, U.S. 20040023334, U.S. 20030226155, WO 04/020454, and WO 04/019872 discuss the manufacture and use of transferrin fusion proteins. Transferrin fusion proteins may improve circulatory half life and efficacy, decrease undesirable side effects and allow reduced dosage.

The peptides and agonists of the invention can be recombinantly expressed in bacteria. Bacteria expressing the peptide or agonists can be administered orally, rectally, mucosally or in via some other mode of administration including but not limited to those described herein.

Analgesic Agents in combitherapy

The peptides and agonists described herein can be used in combination therapy with an analgesic agent, e.g., an analgesic compound or an analgesic peptide. These peptides and compounds can be administered with the peptides of the invention (simultaneously or sequentially). They can also be optionally covalently linked or attached to an agent described herein to create therapeutic conjugates. Among the useful analgesic agents are: Ca channel blockers, 5HT receptor antagonists (for example 5HT3, 5HT4 and 5HT1 receptor antagonists), opioid receptor agonists (loperamide, fedotozine, and fentanyl), NK1 receptor antagonists, CCK receptor agonists (e.g., loxiglumide), NK1 receptor antagonists, NK3 receptor antagonists, norepinephrine-serotonin reuptake inhibitors (NSRI), vanilloid and cannabanoid receptor agonists, and sialorphin. Analgesics agents in the various classes are described in the literature.

Among the useful analgesic peptides are sialorphin-related peptides, including those comprising the amino acid sequence QHNPR (SEQ ID NO:), including: VQHNPR (SEQ ID NO:); VRQHNPR (SEQ ID NO:); VRGQHNPR (SEQ ID NO:); VRGPQHNPR (SEQ ID NO:); VRGPRQHNPR (SEQ ID NO:); VRGPRRQHNPR (SEQ ID NO:); and RQHNPR (SEQ ID NO:). Sialorphin-related peptides bind to neprilysin and inhibit neprilysin-mediated breakdown of substance P and Met-enkephalin. Thus, compounds or peptides that are inhibitors of neprilysin are useful analgesic agents which can be administered with the peptides of the invention in a co-therapy or linked to the peptides of the invention, e.g., by a covalent bond. Sialophin and related peptides are described in U.S. Patent 6,589,750; U.S. 20030078200 A1; and WO 02/051435 A2.

Opioid receptor antagonists and agonists can be administered with the peptides of the invention in co-therapy or linked to the agent of the invention, e.g., by a covalent bond. For example, opioid receptor antagonists such as naloxone, naltrexone, methyl nalozone, nalmefene, cypridime, beta funaltrexamine, naloxonazine, naltrindole, and nor-binaltorphimine are thought to be useful in the treatment of IBS. It can be useful to formulate opioid antagonists of this type is a delayed and sustained release formulation such that initial release of the antagonist is in the mid to distal small intestine and/or ascending colon. Such antagonists are described in WO 01/32180 A2. Enkephalin pentapeptide (HOE825; Tyr-D-Lys-Gly-Phe-L-homoserine) is an agonist of the mu and delta opioid receptors and is thought to be useful for increasing intestinal motility (*Eur. J. Pharm.* 219:445, 1992), and this peptide can be used in conjunction with the peptides of the invention. Also useful is trimebutine which is thought to bind to mu/delta/kappa opioid receptors and activate release of motilin and modulate the release of gastrin, vasoactive intestinal peptide, gastrin and glucagons. Kappa opioid receptor agonists such as fedotozine, asimadoline, and ketocyclazocine, and compounds described in WO 03/097051 A2 can be used with or linked to the peptides of the invention. In addition, mu opioid receptor agonists such as morphine, diphenyloxylate, frakefamide (H-Tyr-D-Ala-Phe(F)-Phe-NH_2; WO 01/019849 A1) and loperamide can be used.

Tyr-Arg (kyotorphin) is a dipeptide that acts by stimulating the release of met-enkephalins to elicit an analgesic effect (*J. Biol. Chem* 262:8165, 1987). Kyotorphin can be used with or linked to the peptides of the invention.

Chromogranin-derived peptide (CgA 47–66; see, e.g., Ghia et al. 2004 Regulatory Peptides 119:199) can be used with or linked to the peptides of the invention.

CCK receptor agonists such as caerulein from amphibians and other species are useful analgesic agents that can be used with or linked to the peptides of the invention.

Conotoxin peptides represent a large class of analgesic peptides that act at voltage gated Ca channels, NMDA receptors or nicotinic receptors. These peptides can be used with or linked to the peptides of the invention.

Peptide analogs of thymulin (FR Application 2830451) can have analgesic activity and can be used with or linked to the peptides of the invention.

CCK (CCKa or CCKb) receptor antagonists, including loxiglumide and dexloxiglumide (the R-isomer of loxiglumide) (WO 88/05774) can have analgesic activity and can be used with or linked to the peptides of the invention.

Other useful analgesic agents include 5-HT4 agonists such as tegaserod (Zelnorm®), mosapride, metoclopramide, zacopride, cisapride, renzapride, benzimidazolone derivatives such as BIMU 1 and BIMU 8, and lirexapride. Such agonists are described in: EP1321142 A1, WO 03/053432A1, EP 505322 A1, EP 505322 B1, US 5,510,353, EP 507672 A1, EP 507672 B1, and US 5,273,983.

Calcium channel blockers such as ziconotide and related compounds described in, for example, EP625162B1, US 5,364,842, US 5,587,454, US 5,824,645, US 5,859,186, US 5,994,305, US 6,087,091, US 6,136,786, WO 93/13128 A1, EP 1336409 A1, EP 835126 A1, EP 835126 B1, US 5,795,864, US 5,891,849, US 6,054,429, WO 97/01351 A1, can be used with or linked to the peptides of the invention.

Various antagonists of the NK-1, NK-2, and NK-3 receptors (for a review see Giardina et al. 2003 *Drugs* 6:758) can be can be used with or linked to the peptides of the invention.

NK1 receptor antagonists such as: aprepitant (Merck & Co Inc), vofopitant, ezlopitant (Pfizer, Inc.), R-673 (Hoffmann-La Roche Ltd), SR-48968 (Sanofi Synthelabo), CP-122,721 (Pfizer, Inc.), GW679769 (Glaxo Smith Kline), TAK-637 (Takeda/Abbot), SR-14033, and related

compounds described in, for example, EP 873753 A1, US 20010006972 A1, US 20030109417 A1, WO 01/52844 A1, can be used with or linked to the peptides of the invention.

NK-2 receptor antagonists such as nepadutant (Menarini Ricerche SpA), saredutant (Sanofi-Synthelabo), GW597599 (Glaxo Smith Kline), SR-144190 (Sanofi-Synthelabo) and UK-290795 (Pfizer Inc) can be used with or linked to the peptides of the invention.

NK3 receptor antagonists such as osanetant (SR-142801; Sanofi-Synthelabo), SSR-241586, talnetant and related compounds described in, for example, WO 02/094187 A2, EP 876347 A1, WO 97/21680 A1, US 6,277,862, WO 98/11090, WO 95/28418, WO 97/19927, and Boden et al. (*J Med Chem.* 39:1664-75, 1996) can be used with or linked to the peptides of the invention.

Norepinephrine-serotonin reuptake inhibitors (NSRI) such as milnacipran and related compounds described in WO 03/077897 A1 can be used with or linked to the peptides of the invention.

Vanilloid receptor antagonists such as arvanil and related compouds described in WO 01/64212 A1 can be used with or linked to the peptides of the invention.

The analgesic peptides and compounds can be administered with the peptides and agonists of the invention (simultaneously or sequentially). The analgesic agents can also be covalently linked to the peptides and agonists of the invention to create therapeutic conjugates. Where the analgesic is a peptide and is covalently linked to an agent described herein the resulting peptide may also include at least one trypsin cleavage site. When present within the peptide, the analgesic peptide may be preceded by (if it is at the carboxy terminus) or followed by (if it is at the amino terminus) a trypsin cleavage site that allows release of the analgesic peptide.

In addition to sialorphin-related peptides, analgesic peptides include: AspPhe, endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, ziconotide, and substance P.

Other Agents for Use in Combitherapy

Also within the invention are pharmaceutical compositions comprising a peptide or agonists of the invention and a second therapeutic agent. The second therapeutic agent can be administered to treat any condition for which it is useful, including conditions that are not considered to be the primary indication for treatment with the second therapeutic agent. The second therapeutic agent can be administered simultaneously or sequentially. The second therapeutic agent can be covalently linked to the peptides and agonists of the invention to create a therapeutic conjugate. When the second therapeutic agent is another peptide, a linker including those described herein may be used between the peptide of the invention and the second therapeutic peptide.

Examples of additional therapeutic agents to treat gastrointestinal and other disorders include:

(1) agents to treat constipation (e.g., a chloride channel activator such as the bicylic fatty acid, Lubiprostone (formerly known as SPI-0211; Sucampo Pharmaceuticals, Inc.; Bethesda, MD), a laxative such as MiraLax; Braintree Laboratories, Braintree MA);

(2) acid reducing agents such as proton pump inhibitors (e.g., omeprazole (Prilosec®), esomeprazole (Nexium®), lansoprazole (Prevacid®), pantoprazole (Protonix®) and rabeprazole (Aciphex®)) and Histamine H2-receptor antagonist (also known as H2 receptor blockers including cimetidine, ranitidine, famotidine and nizatidine);

(3) prokinetic agents including metoclopramide (Reglan®), domperidone (Motilium®), erythromycin or cisapride (propulsid®)

(4) pro-motility agents such as the vasostatin-derived peptide, chromogranin A (4–16) (see, e.g., Ghia et al. 2004 Regulatory Peptides 121:31) or motilin agonists (e.g., GM-611 or mitemcinal fumarate);

(5) complete or partial 5HT (e.g. 5HT1, 5HT2, 5HT3, 5HT4) receptor agonists or antagonists (including 5HT4 receptor agonists (such as tegaserod (ZELNORM®), mosapride, metoclopramide, zacopride, cisapride, renzapride, benzimidazolone derivatives such as BIMU 1 and BIMU 8, and lirexapride. Such agonists are described in: EP1321142 A1, WO 03/053432A1, EP 505322 A1, EP 505322 B1, US 5,510,353, EP 507672 A1, EP 507672

B1, and US 5,273,983); 5HT3 receptor agonists such as MKC-733; and 5HT3 receptor antagonists such as alosetron and ATI-7000 (Aryx Therapeutics, Santa Clara CA);

(6) muscarinic receptor agonists;

(7) anti-inflammatory agents;

(8) antispasmodics;

(9) antidepressants;

(10) centrally-acting analgesic agents such as opioid receptor agonists, opioid receptor antagonists (e.g., naltrexone);

(11) agents for the treatment of Inflammatory bowel disease;

(12) agents for the treatment of Crohn's disease and/or ulcerative colitis (e.g., alequel (Enzo Biochem, Inc.; Farmingsale, NY), the anti-inflammatory peptide RDP58 (Genzyme, Inc.; Cambridge, MA), and TRAFICET-EN™ (ChemoCentryx, Inc.; San Carlos, CA);

(13) agents that treat gastrointestinal or visceral pain;

(14) PDE (phosphodiesterase) inhibitors including but not limited to those disclosed herein;

(15) purgatives that draw fluids to the intestine (e.g., VISICOL®, a combination of sodium phosphate monobasic monohydrate and sodium phosphate dibasic anhydrate);

(16) Corticotropin Releasing Factor (CRF) receptor antagonists (including NBI-34041 (Neurocrine Biosciences, San Diego, CA), CRH9-41, astressin, R121919 (Janssen Pharmaceutica), CP154,526, NBI-27914, Antalarmin, DMP696 (Bristol-Myers Squibb) CP-316,311 (Pfizer, Inc.), GW876008 (Neurocrine/Glaxo Smith Kline), ONO-2333Ms (Ono Pharmaceuticals), TS-041 (Janssen), AAG561 (Novartis) and those disclosed in US 5,063,245, US 5,861,398, US20040224964, US20040198726, US20040176400, US20040171607, US20040110815, and US20040006066);

(17) glucagon-like peptides (glp-1) and analogues thereof (including exendin-4) and inhibitors of DPP-IV (DPP-IV mediates the inactivation of glp-1);

(18) tofisopam, enantiomerically-pure R-tofisopam, and pharmaceutically-acceptable salts thereof (US 20040229867)

(19) the tricyclic anti-depressant of the dibenzothiazepine type, tianeptine (Stablon®) and other agents described in U.S. 6,683,072;

(20) (E)-4 (1,3bis(cyclohexylmethyl)-1,2,34,-tetrahydro-2,6-diono-9H-purin-8-yl)cinnamic acid nonaethylene glycol methyl ether ester and related compounds described in WO 02/067942;

and

(21) the probiotic PROBACTRIX® (The BioBalance Corporation; New York, NY) which contains microorganisms useful in the treatment of gastrointestinal disorders.

The peptides and agonists of the invention can be used in combination therapy with insulin and related compounds including primate, rodent, or rabbit insulin including biologically active variants thereof including allelic variants, more preferably human insulin available in recombinant form. Sources of human insulin include pharmaceutically acceptable and sterile formulations such as those available from Eli Lilly (Indianapolis, Ind. 46285) as Humulin.TM. (human insulin rDNA origin). See the THE PHYSICIAN'S DESK REFERENCE, 55.sup.th Ed. (2001) Medical Economics, Thomson Healthcare (disclosing other suitable human insulins). The peptides of the invention can also be used in combination therapy with agents that can boost insulin effects or levels of a subject upon administration, e.g. glipizide and/or rosiglitazone. The peptides and agonists of the invention can be used in combitherapy with SYMLIN® (pramlintide acetate) and Exenatide® (synthetic exendin-4; a 39 aa peptide).

The peptides and agonists of the invention can also be used in combination therapy with agents (e.g., Entereg(TM) (alvimopan; formerly called adolor/ ADL 8-2698), conivaptan and related agents describe in US 6,645,959) for the treatment of postoperative ileus.

The peptides and agonists of the invention can be used in combination therapy with an anti-hypertensive agent including but not limited to:

(1) diuretics, such as thiazides, including chlorthalidone, chlorthiazide, dichlorophenamide, hydroflumethiazide, indapamide, polythiazide, and hydrochlorothiazide; loop diuretics, such as bumetanide, ethacrynic acid, furosemide, and torsemide; potassium sparing agents, such as amiloride, and triamterene; and aldosterone antagonists, such as spironolactone, epirenone, and the like;

(2) beta-adrenergic blockers such as acebutolol, atenolol, betaxolol, bevantolol, bisoprolol, bopindolol, carteolol, carvedilol, celiprolol, esmolol, indenolol, metaprolol, nadolol, nebivolol, penbutolol, pindolol, propanolol, sotalol, tertatolol, tilisolol, and timolol, and the like;

(3) calcium channel blockers such as amlodipine, aranidipine, azelnidipine, barnidipine, benidipine, bepridil, cinaldipine, clevidipine, diltiazem, efonidipine, felodipine, gallopamil, isradipine, lacidipine, lemildipine, lercanidipine, nicardipine, nifedipine, nilvadipine, nimodepine, nisoldipine, nitrendipine, manidipine, pranidipine, and verapamil, and the like;

(4) angiotensin converting enzyme (ACE) inhibitors such as benazepril; captopril; ceranapril; cilazapril; delapril; enalapril; enalopril; fosinopril; imidapril; lisinopril; losinopril; moexipril; quinapril; quinaprilat; ramipril; perindopril; perindropril; quanipril; spirapril; tenocapril; trandolapril, and zofenopril, and the like;

(5) neutral endopeptidase inhibitors such as omapatrilat, cadoxatril and ecadotril, fosidotril, sampatrilat, AVE7688, ER4030, and the like;

(6) endothelin antagonists such as tezosentan, A308165, and YM62899, and the like;

(7) vasodilators such as hydralazine, clonidine, minoxidil, and nicotinyl alcohol, and the like;

(8) angiotensin II receptor antagonists such as aprosartan, candesartan, eprosartan, irbesartan, losartan, olmesartan, pratosartan, tasosartan, telmisartan, valsartan, and EXP-3137, FI6828K, and RNH6270, and the like;

(9) α/β adrenergic blockers such as nipradilol, arotinolol and amosulalol, and the like;

(10) alpha 1 blockers, such as terazosin, urapidil, prazosin, tamsulosin, bunazosin, trimazosin, doxazosin, naftopidil, indoramin, WHP 164, and XEN010, and the like;

(11) alpha 2 agonists such as lofexidine, tiamenidine, moxonidine, rilmenidine and guanobenz, and the like;

(12) aldosterone inhibitors, and the like; and

(13) angiopoietin-2-binding agents such as those disclosed in WO03/030833.

The peptides and agonists of the invention can be used in combination therapy with one or more of the following agents useful in the treatment of respiratory and other disorders:

(1) β-agonists including but not limited to: albuterol (PROVENTIL®, SALBUTAMOl®, VENTOLIN®), bambuterol, bitoterol, clenbuterol, fenoterol, formoterol, isoetharine (BRONKOSOL®, BRONKOMETER®), metaproterenol (ALUPENT®, METAPREL®), pirbuterol (MAXAIR®), reproterol, rimiterol, salmeterol, terbutaline (BRETHAIRE®, BRETHINE®, BRICANYL®), adrenalin, isoproterenol (ISUPREL®), epinephrine bitartrate (PRIMATENE®), ephedrine, orciprenline, fenoterol and isoetharine;

(2) steroids, including but not limited to beclomethasone, beclomethasone dipropionate, betamethasone, budesonide, bunedoside, butixocort, dexamethasone, flunisolide, fluocortin, fluticasone, hydrocortisone, methyl prednisone, mometasone, predonisolone, predonisone, tipredane, tixocortal, triamcinolone, and triamcinolone acetonide;

(3) β2-agonist-corticosteroid combinations [e.g., salmeterol-fluticasone (ADVAIR®), formoterol-budesonid (SYMBICORT®)];

(4) leukotriene D4 receptor antagonists/leukotriene antagonists/LTD4 antagonists (i.e., any compound that is capable of blocking, inhibiting, reducing or otherwise interrupting the interaction between leukotrienes and the Cys LTI receptor) including but not limited to: zafirlukast, montelukast, montelukast sodium (SINGULAIR®), pranlukast, iralukast, pobilukast, SKB-106,203 and compounds described as having LTD4 antagonizing activity described in U.S. Patent No. 5,565,473;

(5) 5-lipoxygenase inhibitors and/or leukotriene biosynthesis inhibitors [e.g., zileuton and BAY1005 (CA registry 128253-31-6)];

(6) histamine H1 receptor antagonists/antihistamines (i.e., any compound that is capable of blocking, inhibiting, reducing or otherwise interrupting the interaction between histamine and its receptor) including but not limited to: astemizole, acrivastine, antazoline, azatadine, azelastine, astamizole, bromopheniramine, bromopheniramine maleate, carbinoxamine, carebastine, cetirizine, chlorpheniramine, chloropheniramine maleate, cimetidine ,clemastine, cyclizine, cyproheptadine, descarboethoxyloratadine, dexchlorpheniramine, dimethindene, diphenhydramine, diphenylpyraline, doxylamine succinate, doxylarnine, ebastine, efletirizine, epinastine, farnotidine, fexofenadine, hydroxyzine, hydroxyzine, ketotifen, levocabastine, levocetirizine, levocetirizine, loratadine, meclizine, mepyramine, mequitazine, methdilazine, mianserin, mizolastine, noberastine, norasternizole,

noraztemizole, phenindamine, pheniramine, picumast, promethazine, pynlamine, pyrilamine, ranitidine, temelastine, terfenadine, trimeprazine, tripelenamine, and triprolidine;

(7) an anticholinergic including but not limited to: atropine, benztropine, biperiden, flutropium, hyoscyamine, ilutropium, ipratropium, ipratropium bromide, methscopolamine, oxybutinin, rispenzepine, scopolamine, and tiotropium;

(8) an anti-tussive including but not limited to: dextromethorphan, codeine, and hydromorphone;

(9) a decongestant including but not limited to: pseudoephedrine and phenylpropanolamine;

(10) an expectorant including but not limited to: guafenesin, guaicolsulfate, terpin, ammonium chloride, glycerol guaicolate, and iodinated glycerol;

(11) a bronchodilator including but not limited to: theophylline and aminophylline;

(12) an anti-inflammatory including but not limited to: fluribiprofen, diclophenac, indomethacin, ketoprofen, S-ketroprophen, tenoxicam;

(13) a PDE (phosphodiesterase) inhibitor including but not limited to those disclosed herein;

(14) a recombinant humanized monoclonal antibody [e.g. xolair (also called omalizumab), rhuMab, and talizumab];

(15) a humanized lung surfactant including recombinant forms of surfactant proteins SP-B, SP-C or SP-D [e.g. SURFAXIN®, formerly known as dsc-104 (Discovery Laboratories)],

(16) agents that inhibit epithelial sodium channels (ENaC) such as amiloride and related compounds;

(17) antimicrobial agents used to treat pulmonary infections such as acyclovir, amikacin, amoxicillin, doxycycline, trimethoprin sulfamethoxazole, amphotericin B, azithromycin, clarithromycin, roxithromycin, clarithromycin, cephalosporins(ceffoxitin, cefmetazole etc), ciprofloxacin, ethambutol, gentimycin, ganciclovir, imipenem, isoniazid, itraconazole, penicillin, ribavirin, rifampin, rifabutin,amantadine, rimantidine, streptomycin, tobramycin, and vancomycin;

(18) agents that activate chloride secretion through Ca++ dependent chloride channels (such as purinergic receptor (P2Y(2) agonists);

(19) agents that decrease sputum viscosity, such as human recombinant DNase 1, (Pulmozyme®);

(20) nonsteroidal anti-inflammatory agents (acemetacin, acetaminophen, acetyl salicylic acid, alclofenac, alminoprofen, apazone, aspirin, benoxaprofen, bezpiperylon, bucloxic acid, carprofen, clidanac, diclofenac, diclofenac, diflunisal, diflusinal, etodolac, fenbufen, fenbufen, fenclofenac, fenclozic acid, fenoprofen, fentiazac, feprazone, flufenamic acid, flufenisal, flufenisal, fluprofen, flurbiprofen, flurbiprofen, furofenac, ibufenac, ibuprofen, indomethacin, indomethacin, indoprofen, isoxepac, isoxicam, ketoprofen, ketoprofen, ketorolac, meclofenamic acid, meclofenamic acid, mefenamic acid, mefenamic acid, miroprofen, mofebutazone, nabumetone oxaprozin, naproxen, naproxen, niflumic acid , oxaprozin, oxpinac, oxyphenbutazone, phenacetin, phenylbutazone, phenylbutazone, piroxicam, piroxicam, pirprofen, pranoprofen, sudoxicam,tenoxican , sulfasalazine, sulindac, sulindac, suprofen, tiaprofenic acid, tiopinac, tioxaprofen, tolfenamic acid, tolmetin, tolmetin, zidometacin, zomepirac, and zomepirac); and

(21) aerosolized antioxidant therapeutics such as S-Nitrosoglutathione.

The peptides and agonists of the invention can be used in combination therapy with an anti-obesity agent including but not limited to:

(1) 11β HSD-1 (11-beta hydroxy steroid dehydrogenase type 1) inhibitors, such as BVT 3498, BVT 2733, 3-(1-adamanty1)-4-ethyl-5-(ethy1thio)- 4H-1,2,4-triazole, 3-(l-adamantyl)-5-(3,4,5-trimethoxypheny1)-4-methy1-4H-1,2,4-triazole, 3- adamantanyl-4,5,6,7,8,9,10,11,12,3a-decahydro-l,2,4-triazolo[4,3-a][11]annulene, and those compounds disclosed in WO01/90091, WO01/90090, WO01/90092 and WO02/072084;

(2) 5HT (serotonin) transporter inhibitors, such as paroxetine, fluoxetine (Prozac®), fenfluramine, fluvoxamine, sertraline, and imipramine, and those disclosed in WO03/00663;

(3) 5HT antagonists such as those in WO03/037871, WO03/037887, and the like;

(4) 5HT1a modulators such as those disclosed in WO03/031439, and the like;

(5) 5HT-2 agonists;

(6) 5HT2c (serotonin receptor 2c) agonists, such as BVT933, DPCA37215, IK264, PNU 22394, WAY161503, R-1065, SB 243213 (Glaxo Smith Kline) and YM 348 and those disclosed in U.S. Patent No. 3,914,250 and PCT publication Nos. WO02/36596, WO02/48124, WO02/10169, WO01/66548, WO02/44152, WO02/51844, WO02/40456, and WO02/40457;

(7) 5HT6 receptor modulators, such as those in WO03/030901, WO03/035061, WO03/039547, and the like;

(8) ACC2 (acetyl-CoA carboxylase-2) inhibitors;

(9) acyl-estrogens, such as oleoyl-estrone, disclosed in del Mar-Grasa, M. et al., Obesity Research, 9:202-9 (2001) and Japanese Patent Application No. JP 2000256190;

(10) alpha-lipoic acid (alpha-LA);

(11) anorectic bicyclic compounds such as 1426 (Aventis) and 1954 (Aventis), and the compounds disclosed in WO00/18749, WO01/32638, WO01/62746, WO01/62747, and WO03/015769;

(12) AOD9604;

(13) appetite suppressants such as those in WO03/40107;

(14) ATL-962 (Alizyme PLC);

(15) benzocaine;

(16) benzphetamine hydrochloride (Didrex);

(17) bladderwrack (focus vesiculosus);

(18) BRS3 (bombesin receptor subtype 3) agonists;

(19) bupropion;

(20) caffeine;

(21) CB 1 (cannabinoid-1 receptor) antagonist/inverse agonists, such as rimonabant (Acomplia; Sanofi Synthelabo), SR-147778 (Sanofi Synthelabo), BAY 65-2520 (Bayer), and SLV 319 (Solvay), and those disclosed in US Patent Nos. 4,973,587, 5,013,837, 5,081,122, 5,112,820, 5,292,736, 5,532,237, 5,624,941, 6,028,084, and 6,509,367 and WO96/33159, WO97/29079, WO98/31227, WO98/33765, WO98/37061, WO98/41519, WO98/43635, WO98/43636, WO99/02499, WO00/10967, WO00/10968, WO01/09120, WO01/58869, WO01/64632, WO01/64633, WO01/64634, WO01/70700, WO01/96330,

WO02/076949, WO03/006007, WO03/007887, WO03/020217, WO03/026647, WO03/026648, WO03/027069, WO03/027076, WO03/027114, WO03/037332, WO03/040107, WO03/086940, WO03/084943 and US6,509,367 and EPO Application No. EP-658546;

(22) CCK agonists;

(23) CCK-A (cholecystokinin-A) agonists, such as AR-R 15849, GI 181771, JMV-180, A-71378, A-71623 and SR146131, and those described in U.S. Pat. No. 5,739,106;

(24) chitosan;

(25) chromium;

(26) CNTF (Ciliary neurotrophic factors), such as GI-181771 (Glaxo-SmithKline), SR146131 (Sanofi Synthelabo), butabindide, PD170,292, and PD 149164 (Pfizer);

(27) CNTF derivatives, such as axokine (Regeneron), and those disclosed in PCT Application Nos. WO 94/09134, WO 98/22128, and WO 99/43813;

(28) conjugated linoleic acid;

(29) corticotropin-releasing hormone agonists;

(30) dehydroepiandrosterone;

(31) DGAT1 (diacylglycerol acyltransferase 1) inhibitors;

(32) DGAT2 (diacylglycerol acyltransferase 2) inhibitors;

(33) dicarboxylate transporter inhibitors;

(34) diethylpropion hydrochloride (Tenuate);

(35) dipeptidyl peptidase IV (DP-IV) inhibitors, such as isoleucine thiazolidide, valine pyrrolidide, NVP-DPP728, LAF237, P93/01, TSL 225, TMC-2A/2B/2C, FE 999011, P9310/K364, VIP 0177, SDZ 274-444 and the compounds disclosed in PCT publication Nos. WO02/083128, WO02/062764, WO03/000180, WO03/000181, WO03/000250, WO03/002530, WO03/002531, WO03/002553, WO03/002593, WO03/004498, WO03/004496,WO03/017936, WO03/024942, WO03/024965, WO03/033524, WO03/037327 and EP1258476;

(36) ephedra;

(37) exendin-4 (an inhibitor of glp-1)

(38) FAS (fatty acid synthase) inhibitors, such as Cerulenin and C75;

(39) fat resorption inhibitors such as those in WO03/053451, and the like;

(40) fatty acid transporter inhibitors;

(41) fiber (psyllium, plantago, guar fiber);

(42) galanin antagonists;

(43) galega (Goat's Rue, French Lilac);

(44) garcinia cambogia;

(45) germander (teucrium chamaedrys);

(46) ghrelin antagonists, such as those disclosed in PCT Application Nos. WO 01/87335, and WO 02/08250;

(47) GLP-1 (glucagon-like peptide 1) agonists (e.g. exendin-4);

(48) glp-1 (glucagon-like peptide-1);

(49) glucocorticoid antagonists;

(50) glucose transporter inhibitors;

(51) growth hormone secretagogue receptor agonists/antagonists, such as NN703, hexarelin, MK-0677, SM-130686, CP-424,391, L-692,429 and L-163,255, and such as those disclosed in U.S. Pat. No. 6,358,951, U.S. Patent Application Nos. 2002/049196 and 2002/022637, and PCT Application Nos. WO 01/56592 and WO 02/32888;

(52) growth hormone secretagogues, such as those disclosed and specifically described in U.S. Pat. No. 5,536,716;

(53) H3 (histamine H3) antagonist/inverse agonists, such as thioperamide, 3-(1H-imidazol-4-yl)propyl N-(4-pentenyl)carbamate), clobenpropit, iodophenpropit, imoproxifan, GT2394 (Gliatech), and A331440, and those disclosed in PCT publication No. WO02/15905 and O-[3-(1H-imidazol-4-yl)propanol]carbamates (Kiec-Kononowicz, K. et al., Pharmazie, 55:349-55 (2000)), piperidine-containing histamine H3-receptor antagonists (Lazewska, D. et al., Pharmazie, 56:927-32 (2001), benzophenone derivatives and related compounds (Sasse, A. et al., Arch. Pharm.(Weinheim) 334:45-52 (2001)), substituted N-phenylcarbamates (Reidemeister, S. et al., Pharmazie, 55:83-6 (2000)), and proxifan derivatives (Sasse, A. et al., J. Med. Chem.. 43:3335-43 (2000)) and histamine H3 receptor modulators such as those disclosed in WO03/024928 and WO03/024929;

(54) interleukin-6 (IL-6) and modulators thereof, as in WO03/057237, and the like;

(55) L-carnitine;

(56) leptin derivatives, such as those disclosed in U.S. Pat. Nos. 5,552,524, 5,552,523, 5,552,522, 5,521,283, and PCT International Publication Nos. WO 96/23513, WO 96/23514, WO 96/23515, WO 96/23516, WO 96/23517, WO 96/23518, WO 96/23519, and WO 96/23520;

(57) leptin, including recombinant human leptin (PEG-OB, Hoffman La Roche) and recombinant methionyl human leptin (Amgen);

(58) lipase inhibitors, such as tetrahydrolipstatin (orlistat/Xenical®), Triton WR1339, RHC80267, lipstatin, teasaponin, and diethylumbelliferyl phosphate, FL-386, WAY-121898, Bay-N-3176, valilactone, esteracin, ebelactone A, ebelactone B, and RHC 80267, and those disclosed in PCT publication No. WO01/77094, and U.S. Patent Nos. 4,598,089,4,452,813, 5,512,565, 5,391,571, 5,602,151, 4,405,644, 4,189,438, and 4,242,453;

(59) lpid metabolism modulators such as maslinic acid, erythrodiol, ursolic acid uvaol, betulinic acid, betulin, and the like and compounds disclosed in WO03/011267;

(60) Mc3r (melanocortin 3 receptor) agonists;

(61) Mc4r (melanocortin 4 receptor) agonists, such as CHIR86036 (Chiron), ME-10142, ME-10145, and HS-131 (Melacure), and those disclosed in PCT publication Nos. WO99/64002, WO00/74679, WO01/991752, WO01/25192, WO01/52880, WO01/74844, WO01/70708, WO01/70337, WO01/91752, WO02/059095, WO02/059107, WO02/059108, WO02/059117, WO02/06276, WO02/12166, WO02/11715, WO02/12178, WO02/15909, WO02/38544, WO02/068387, WO02/068388, WO02/067869, WO02/081430, WO03/06604, WO03/007949, WO03/009847, WO03/009850, WO03/013509, and WO03/031410;

(62) Mc5r (melanocortin 5 receptor) modulators, such as those disclosed in WO97/19952, WO00/15826, WO00/15790, US 20030092041;

(63) MCH2R (melanin concentrating hormone 2R) agonist/antagonists;

(64) melanin concentrating hormone antagonists;

(65) melanin-concentrating hormone 1 receptor (MCHR) antagonists, such as T-226296 (Takeda), SNP-7941 (Synaptic), and those disclosed WO01/21169, WO01/82925,

WO01/87834, WO02/051809, WO02/06245, WO02/076929, WO02/076947, WO02/04433, WO02/51809, WO02/083134, WO02/094799, WO03/004027, WO03/13574, WO03/15769, WO03/028641, WO03/035624, WO03/033476, WO03/033480 and Japanese Patent Application Nos. JP 13226269, and JP1437059;

(66) melanocortin agonists, such as Melanotan II or those described in WO 99/64002 and WO 00/74679;

(67) Metformin (GLUCOPHAGE®);

(68) mGluR5 modulators such as those disclosed in WO03/029210, WO03/047581, WO03/048137, WO03/051315, WO03/051833, WO03/053922, WO03/059904, and the like;

(69) monoamine reuptake inhibitors, such as sibutratmine (Meridia®/Reductil®) and salts thereof, and those compounds disclosed in U.S. Patent Nos. 4,746,680, 4,806,570, and 5,436,272, and U.S. Patent Publication No. 2002/0006964, and WO01/27068, and WO01/62341;

(70) NE (norepinephrine) transport inhibitors, such as GW 320659, despiramine, talsupram, and nomifensine;

(71) nomame herba;

(72) non-selective serotonin/norepinephrine transport inhibitors, such as sibutramine or fenfluramine;

(73) NPY 1 antagonists, such as BIBP3226, J-115814, BIBO 3304, LY-357897, CP-671906, GI-264879A, and those disclosed in U.S. Pat. No. 6,001,836, and PCT Patent Publication Nos. WO 96/14307, WO 01/23387, WO 99/51600, WO 01/85690, WO 01/85098, WO 01/85173, and WO 01/89528;

(74) NPY5 (neuropeptide Y Y5) antagonists, such as 152,804, GW-569180A, GW-594884A, GW-587081X, GW-548118X, FR235208, FR226928, FR240662, FR252384, 1229U91, GI-264879A, CGP71683A, LY-377897, LY-366377, PD-160170, SR- 120562A, SR-120819A, JCF-104, and H409/22 and those compounds disclosed in U.S. Patent Nos. 6,140,354, 6,191,160, 6,258,837, 6,313,298, 6,326,375, 6,329,395, 6,335,345, 6,337,332, 6,329,395, and 6,340,683, European Patent Nos. EP-01010691, and EP-01044970 and PCT Publication Nos. WO97/19682, WO97/20820, WO97/20821, WO97/20822, WO97/20823,

WO98/27063, WO00/107409, WO00/185714, WO00/185730, WO00/64880, WO00/68197, WO00/69849, WO01/09120, WO01/14376, WO01/85714, WO01/85730, WO01/07409, WO01/02379, WO01/23388, WO01/23389, WO01/44201, WO01/62737, WO01/62738, WO01/09120, WO02/20488, WO02/22592, WO02/48152, WO02/49648, WO02/051806, WO02/094789, WO03/009845, WO03/014083, WO03/022849, WO03/028726 and Norman et al., J. Med. Chem. 43:4288-4312 (2000);

(75) opioid antagonists, such as nalmefene (REVEX ®), 3-methoxynaltrexone, naloxone, and naltrexone and those disclosed in WO00/21509;

(76) orexin antagonists, such as SB-334867-A and those disclosed in PCT publication Nos. WO01/96302, WO01/68609, WO02/44172, WO02/51232, WO02/51838, WO02/089800, WO02/090355, WO03/023561, WO03/032991, and WO03/037847;

(77) PDE (phosphodiesterase) inhibitors including but not limited to those disclosed herein;

(78) peptide YY and fragments and variants thereof (e.g. YY3–36 (PYY3-36)(N. Engl. J. Med. 349:941, 2003; IKPEAPGE DASPEELNRY YASLRHYLNL VTRQRY (SEQ ID NO:XXX)) and PYY agonists such as those disclosed in WO03/026591;

(79) phendimetrazine;

(80) phentermine,

(81) phosphate transporter inhibitors;

(82) phosphodiesterase-3B (PDE3B) inhibitors;

(83) phytopharm compound 57 (CP 644,673);

(84) pyruvate;

(85) SCD-1 (stearoyl-CoA desaturase-1) inhibitors;

(86) serotonin reuptake inhibitors, such as dexfenfluramine, fluoxetine, and those in U.S. Patent No. 6,365,633, and WO01/27060, and WO01/162341;

(87) T71 (Tularik; Inc.; Boulder CO);

(88) thyroid hormone β agonists, such as KB-2611 (KaroBioBMS), and those disclosed in WO02/15845 and Japanese Patent Application No. JP 2000256190;

(89) Topiramate (TOPIMAX®);

(90) transcription factor modulators such as those disclosed in WO03/026576;

(91) UCP-1 (uncoupling protein-1), 2, or 3 activators, such as phytanic acid, 4-[(E)-2-(5,6,7,8-tetrahydro-5,5,8,8-tetramethyl-2-napthalenyl)-1-propeny- l]benzoic acid (TTNPB), retinoic acid, and those disclosed in PCT Patent Application No. WO 99/00123;

(92) β3 (beta adrenergic receptor 3) agonists, such as AD9677/TAK677 (Dainippon/Takeda), CL-316,243, SB 418790, BRL-37344, L-796568, BMS-196085, BRL-35135A, CGP12177A, BTA-243, GW 427353, Trecadrine, Zeneca D7114, N-5984 (Nisshin Kyorin), LY-377604 (Lilly), and SR 59119A, and those disclosed in US Patent Nos. 5,705,515, US 5,451,677 and PCT publication Nos. WO94/18161, WO95/29159, WO97/46556, WO98/04526 and WO98/32753, WO01/74782, WO02/32897, WO03/014113, WO03/016276, WO03/016307, WO03/024948, WO03/024953 and WO03/037881;

(93) β-hydroxy steroid dehydrogenase-1 inhibitors (β -HSD-1) and

(94) β-hydroxy-β-methylbutyrate.

Peptides and agonists of the invention useful in the treatment of obesity can be administered as a cotherapy with electrostimulation (US20040015201).

The peptides and agonists of the invention can be used in combination therapy with agents that activate soluble guanylate cyclase, for example those described in US20040192680.

The peptides and agonists of the invention can be used in combination therapy with a phosphodiesterase inhibitor. PDE inhibitors within the meaning of the present invention are those compounds which slow the degradation of cyclic AMP (cAMP) and/or cyclic GMP (cGMP) by inhibition of the phosphodiesterases, which can lead to a relative increase in the intracellular concentration of cAMP and cGMP. Possible PDE inhibitors within the meaning of the present invention are primarily those substances which are to be numbered among the class consisting of the PDE3 inhibitors, the class consisting of the PDE4 inhibitors and/or the class consisting of the PDE5 inhibitors, in particular those substances which can be designated as mixed types of PDE3/4 inhibitors or as mixed types of PDE3/4/5 inhibitors. By way of example, those PDE inhibitors may be mentioned such as are described and/or claimed in the

following patent applications and patents: DE1470341, DE2108438, DE2123328, DE2305339, DE2305575, DE2315801, DE2402908, DE2413935, DE2451417, DE2459090, DE2646469, DE2727481, DE2825048, DE2837161, DE2845220, DE2847621, DE2934747, DE3021792, DE3038166, DE3044568, EP000718, EP0008408, EP0010759, EP0059948, EP0075436, EP0096517, EP0112987, EP0116948, EP0150937, EP0158380, EP0161632, EP0161918, EP0167121, EP0199127, EP0220044, EP0247725, EP0258191, EP0272910, EP0272914, EP0294647, EP0300726, EP0335386, EP0357788, EP0389282, EP0406958, EP0426180, EP0428302, EP0435811, EP0470805, EP0482208, EP0490823, EP0506194, EP0511865, EP0527117, EP0626939, EP0664289, EP0671389, EP0685474, EP0685475, EP0685479, JP92234389, JP94329652, JP95010875, U.S. Pat. Nos. 4,963,561, 5,141,931, WO9117991, WO9200968, WO9212961, WO9307146, WO9315044, WO9315045, WO9318024, WO9319068, WO9319720, WO9319747, WO9319749, WO9319751, WO9325517, WO9402465, WO9406423, WO9412461, WO9420455, WO9422852, WO9425437, WO9427947, WO9500516, WO9501980, WO9503794, WO9504045, WO9504046, WO9505386, WO9508534, WO9509623, WO9509624, WO9509627, WO9509836, WO9514667, WO9514680, WO9514681, WO9517392, WO9517399, WO9519362, WO9522520, WO9524381, WO9527692, WO9528926, WO9535281, WO9535282, WO9600218, WO9601825, WO9602541, WO9611917, DE3142982, DE1116676, DE2162096, EP0293063, EP0463756, EP0482208, EP0579496, EP0667345 US6,331,543, US20050004222 (including those disclosed in formulas I-XIII and paragraphs 37-39, 85-0545 and 557-577) and WO9307124, EP0163965, EP0393500, EP0510562, EP0553174, WO9501338 and WO9603399. PDE5 inhibitors which may be mentioned by way of example are RX-RA-69, SCH-51866, KT-734, vesnarinone, zaprinast, SKF-96231, ER-21355, BF/GP-385, NM-702 and sildenafil (Viagra®). PDE4 inhibitors which may be mentioned by way of example are RO-20-1724, MEM 1414 (R1533/R1500; Pharmacia Roche), DENBUFYLLINE, ROLIPRAM, OXAGRELATE, NITRAQUAZONE, Y-590, DH-6471, SKF-94120, MOTAPIZONE, LIXAZINONE, INDOLIDAN, OLPRINONE, ATIZORAM, KS-506-G, DIPAMFYLLINE, BMY-43351, ATIZORAM, AROFYLLINE, FILAMINAST, PDB-093, UCB-29646, CDP-840, SKF-107806, PICLAMILAST, RS-17597, RS-25344-000, SB-207499, TIBENELAST, SB-210667, SB-211572, SB-211600, SB-212066, SB-212179, GW-3600,

CDP-840, MOPIDAMOL, ANAGRELIDE, IBUDILAST, AMRINONE, PIMOBENDAN, CILOSTAZOL, QUAZINONE and N-(3,5-dichloropyrid-4-yl)-3-cyclopropylmethoxy4-difluoromethoxybenzamide. PDE3 inhibitors which may be mentioned by way of example are SULMAZOLE, AMPIZONE, CILOSTAMIDE, CARBAZERAN, PIROXIMONE, IMAZODAN, CI-930, SIGUAZODAN, ADIBENDAN, SATERINONE, SKF-95654, SDZ-MKS-492, 349-U-85, EMORADAN, EMD-53998, EMD-57033, NSP-306, NSP-307, REVIZINONE, NM-702, WIN-62582 and WIN-63291, ENOXIMONE and MILRINONE. PDE3/4 inhibitors which may be mentioned by way of example are BENAFENTRINE, TREQUINSIN, ORG-30029, ZARDAVERINE, L-686398, SDZ-ISQ-844, ORG-20241, EMD-54622, and TOLAFENTRINE. Other PDE inhibitors include: cilomilast, pentoxifylline, roflumilast, tadalafil(Cialis®), theophylline, and vardenafil(Levitra®), zaprinast (PDE5 specific).

Methods of Treatment

A number of disorders might be treated with GC-C receptor agonists and agents that increase cGMP levels including the peptides and agonists of the invention.

The peptides and agonists of the invention can be used alone or in combination therapy for the treatment or prevention of congestive heart failure. Such agents can be used in combination with natriuretic peptides (e.g., atrial natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide), a diuretic, or an inhibitor of angiotensin converting enzyme.

The peptides and agonists of the invention can be used alone or in combination therapy for the treatment or prevention of benign prostatic hyperplasia (BPH). Such agents can be used in combination with one or more agents for treatment of BPH, for example, a 5-alpha reductase inhibitor (e.g., finasteride) or an alpha adrenergic inhibitor (e.g., doxazosine).

The peptides and agonists of the invention can be used alone or in combination therapy for the treatment, prevention or reduction of visceral pain associated with a gastrointestinal disorder or pain associated with another disorder.

The peptides and agonists of the invention can be used alone or in combination therapy for the treatment or prevention of obesity-related disorders (e.g. disorders that are associated with, caused by, or result from obesity). Examples of obesity-related disorders include overeating and bulimia, hypertension, diabetes, elevated plasma insulin concentrations and insulin resistance, dyslipidemias, hyperlipidemia, endometrial, breast, prostate and colon cancer, osteoarthritis, obstructive sleep apnea, cholelithiasis, gallstones, heart disease, abnormal heart rhythms and arrhythmias, myocardial infarction, congestive heart failure, coronary heart disease, sudden death, stroke, polycystic ovarian disease, craniopharyngioma, the Prader-Willi Syndrome, Frohlich's syndrome, GH-deficient subjects, normal variant short stature, Turner's syndrome, and other pathological conditions showing reduced metabolic activity or a decrease in resting energy expenditure as a percentage of total fat-free mass, e.g., children with acute lymphoblastic leukemia. The agents of the invention may be used to reduce or control body weight (or fat) or to prevent and/or treat obesity or other appetite related disorders related to the excess consumption of food, ethanol and other appetizing substances. The agents may be used to modulate lipid metabolism, reduce body fat (e.g. via increasing fat utilization) or reduce (or suppress) appetite (e.g. via inducing satiety). Further examples of obesity-related disorders are metabolic syndrome, also known as syndrome X, insulin resistance syndrome, sexual and reproductive dysfunction, such as infertility, hypogonadism in males and hirsutism in females, gastrointestinal motility disorders, such as obesity-related gastroesophageal reflux, respiratory disorders, such as obesity-hypoventilation syndrome (Pickwickian syndrome), cardiovascular disorders, inflammation, such as systemic inflammation of the vasculature, arteriosclerosis, hypercholesterolemia, hyperuricaemia, lower back pain, gallbladder disease, gout, and kidney cancer. The agents of the present invention are also useful for reducing the risk of secondary outcomes of obesity, such as reducing the risk of left ventricular hypertrophy.

The peptides and agonists of the invention can be used alone or in combination therapy for the treatment or prevention of gastrointestinal related disorders including: chronic intestinal pseudo-obstruction (Ogilvie's syndrome), colonic pseudoobstruction, Crohn's disease, dyspepsia (including functional dyspepsia or nonulcer dyspepsia), duodenogastric reflux, functional bowel disorder, functional gastrointestinal disorders, functional heartburn, gastroesophageal reflux disease (GERD), gastrointestinal motility disorders, gastroparesis (e.g. idopathic gastroparesis), hypertrophic pyloric stenosis, Inflammatory bowel disease, irritable bowel syndrome (IBS), post-operative ileus, and ulcerative colitis. The peptides and agonists of the invention can be used alone or in combination therapy to patient suffering from or susceptible to GI disorders relating to damage to the GI tract stemming from impact or surgical intervention. The peptides and agonists of the invention can be used alone or in combination therapy to patients at risk for or having particular diseases associated with hypomotility or stasis in the GI tract. For example, diabetic neuropathy, anorexia nervosa, and achlorhydria are frequently accompanied by gastric hypomotility. Damage to the GI tract following surgical intervention, for instance, can result in substantial gastric stasis. The peptides and agonists of the invention can be administered alone or in combination therapy to patients susceptible to or having a GI disorder associated with diabetes (e.g. diabetic gastropathy). The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat GI disorders characterized by at least one of nausea, vomiting, heartburn, postprandial discomfort, diarrhea, constipation, indigestion or related symptoms. The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat GI disorders associated with at least one of diabetes, anorexia nervosa, bulimia, achlorhydria, achalasia, anal fissure, irritable bowel syndrome, intestinal pseudoobstruction, scleroderma and gastrointestinal damage.

The peptides and agonists of the invention can be used to prevent and/or treat constipation (e.g. constipation associated with use of a therapeutic agent; constipation associated with a neuropathic, metabolic or endocrine disorder (including autonomic neuropathy, Chagas disease, cystic fibrosis, diabetes mellitus, Hirschsprung disease, hyperthyroidism, hypocalcaemia, hypothyroidism, Multiple Sclerosis, neurofibromatosis, Parkinson's disease, and spinal cord

lesions); post-surgical constipation (postoperative ileus); constipation associated with a gastrointestinal disorder; idiopathic constipation (functional constipation or slow transit constipation); constipation associated with the use of analgesic drugs (e.g. opioid induced constipation); constipation associated with the use of other agents (e.g. antihypertensives, anticonvulsants, antidepressants, antispasmodics and antipsychotics); megacolon; and chronic constipation).

The peptides and agonists of the invention can be used to treat decreased intestinal motility, slow digestion or slow stomach emptying. The peptides and agonists can be used to relieve one or more symptoms of IBS (bloating, pain, constipation), GERD (acid reflux into the esophagus), duodenogastric reflux, functional dyspepsia, or gastroparesis (nausea, vomiting, bloating, delayed gastric emptying) and other disorders described herein.

The peptides and agonists of the invention can be used to increase intestinal motility and to prevent and/or treat gastrointestinal immotility and other conditions calling for laxative or stool softener therapy. Gastrointestinal immotility can include constipation, and also includes delayed oral cecal transit time, irregular Taxation, and other related gastrointestinal motility disfunction including impaction. Impaction is a condition where a large mass of dry, hard stool develops in the rectum, often due to chronic constipation. This mass may be so hard that it cannot be excreted. The subjects affected by constipation or gastrointestinal immotility can be refractory to laxative therapy and/or stool softener therapy.

The peptides and agonists of the invention can be used for the treatment or prevention of cancer, pre-cancerous growths, or metastatic growths. For example, they can be used for the prevention or treatment of: colorectal/local metastasized colorectal cancer, intestinal polyps, gastrointestinal tract cancer, lung cancer, cancer or pre-cancerous growths or metastatic growths of epithelial cells, polyps, breast, colorectal, lung, ovarian, pancreatic, prostatic, renal, stomach, bladder, liver, esophageal and testicular carcinoma, carcinoma (e.g., basal cell, basosquamous, Brown-Pearce, ductal carcinoma, Ehrlich tumor, Krebs, Merkel cell, small or non-small cell lung, oat cell, papillary, bronchiolar, squamous cell, transitional cell, (Walker),

leukemia (e.g., B-cell, T-cell, HTLV, acute or chronic lymphocytic, mast cell, myeloid), histiocytonia, histiocytosis, Hodgkin's disease, non-Hodgkin's lymphoma, plasmacytoma, reticuloendotheliosis, adenoma, adeno-carcinoma, adenofibroma, adenolymphoma, ameloblastoma, angiokeratoma, angiolymphoid hyperplasia with eosinophilia, sclerosing angioma, angiomatosis, apudoma, branchionia, malignant carcinoid syndrome, carcinoid heart disease, carcinosarcoma, cementoma, cholangioma, cholesteatoma, chondrosarcoma, chondroblastoma, chondrosarcoma, chordoma, choristoma, craniopharyngioma, chrondrorna, cylindroma, cystadenocarcinoma, cystadenoma, cystosarconia phyllodes, dysgenninoma, ependymoma, Ewing sarcoma, fibroma, fibrosarcoma, giant cell tumor, ganglioneuroma, glioblastoma, glomangioma, granulosa cell tumor, gynandroblastoma, hamartoma, hemangioendothelioma, hemangioma, hemangio-pericytoma, hemangiosarcoma, hepatoma, islet cell tumor, Kaposi sarcoma, leiomyoma, leiomyosarcoma, leukosarcoma, Leydig cell tumor, lipoma, liposarcoma, lymphaugioma, lymphangiomyoma, lymphangiosarcoma, medulloblastoma, meningioma, mesenchymoma, mesonephroma, mesothelioma, myoblastoma, myoma, myosarcoma, myxoma, myxosarcoma, neurilemmoma, neuroma, neuroblastoma, neuroepithelioma, neurofibroma, neurofibromatosis, odontoma, osteoma, osteosarcoma, papilloma, paraganglioma, paraganglionia. nonchroinaffin, pinealoma, rhabdomyoma, rhabdomyosarcoma, Sertoli cell tumor, teratoma, theca cell tumor, and other diseases in which cells have become dysplastic, immortalized, or transformed.

The peptides and agonists of the invention can be used for the treatment or prevention of: Familial Adenomatous Polyposis (FAP) (autosomal dominant syndrome) that precedes colon cancer, hereditary nonpolyposis colorectal cancer (HNPCC), and inherited autosomal dominant syndrome.

For treatment or prevention of cancer, pre-cancerous growths and metastatic growths, the peptides and agonists of the invention can be used in combination therapy with radiation or chemotherapeutic agents, an inhibitor of a cGMP-dependent phosphodiesterase or a selective cyclooxygenase-2 inhibitor. A number of selective cyclooxygenase-2 inhibitors are described in US20010024664, U.S. Pat. No. 5,380,738, U.S. Pat. No. 5,344,991, U.S. Pat. No. 5,393,790,

U.S. Pat. No. 5,434,178, U.S. Pat. No. 5,474,995, U.S. Pat. No. 5,510,368, WO02/062369, WO 96/06840, WO 96/03388, WO 96/03387, WO 96/19469, WO 96/25405, WO 95/15316, WO 94/15932, WO 94/27980, WO 95/00501, WO 94/13635, WO 94/20480, and WO 94/26731, the disclosures of which are herein incorporated by reference. [Pyrazol-1-yl]benzenesulfonamides have also been described as inhibitors of cyclooxygenase-2.

The peptides and agonists of the invention can be used in the treatment or prevention of inflammation. Thus, they can be used alone or in combination with an inhibitor of cGMP-dependent phosphodiesterase or a selective cyclooxygenase-2 inhibitor for treatment of: organ inflammation, IBD (e.g, Crohn's disease, ulcerative colitis), asthma, nephritis, hepatitis, pancreatitis, bronchitis, cystic fibrosis, ischemic bowel diseases, intestinal inflammations/allergies, coeliac disease, proctitis, eosnophilic gastroenteritis, mastocytosis, and other inflammatory disorders. The peptides and agonists of the invention can be used alone or in combination therapy in the treatment or prevention of gastrointestinal tract inflammation (e.g. inflammation associated with a gastrointestinal disorder, gastrointestinal tract infection, or another disorder).

The peptides and agonists of the invention can also be used to treat or prevent insulin-related disorders, for example: II diabetes mellitus, hyperglycemia, obesity, disorders associated with disturbances in glucose or electrolyte transport and insulin secretion in cells, or endocrine disorders. They can be also used in insulin resistance treatment and post-surgical and non-post surgery decrease in insulin responsiveness.

The peptides and agonists of the invention can be used to prevent and/or treat pulmonary and respiratory related disorders, including, inhalation, ventilation and mucus secretion disorders, pulmonary hypertension, chronic obstruction of vessels and airways, and irreversible obstructions of vessels and bronchi. One may administer an agent of the invention for treating bronchospasm, for inducing bronchodilation, for treating chronic obstructive pulmonary disease (including chronic bronchitis with normal airflow), for treating asthma (including bronchial asthma, intrinsic asthma, extrinsic asthma, chronic or inveterate asthma (e.g. late asthma and airways hyper-responsiveness), dust-induced asthma, allergen-induced asthma,

viral-induced asthma, cold-induced asthma, pollution-induced asthma and exercise-induced asthma) and for treating rhinitis (including acute-, allergic, hatrophic rhinitis or chronic rhinitis (such as rhinitis caseosa, hypertrophic rhinitis, rhinitis purulenta, rhinitis sicca), rhinitis medicamentosa, membranous rhinitis (including croupous, fibrinous and pseudomembranous rhinitis), scrofulous rhinitis, perennial allergic rhinitis, seasonal rhinitis (including rhinitis nervosa (hay fever) and vasomotor rhinitis). The peptides of the invention may also be useful in the treatment of dry eye disease and chronic sinusitis. The peptides of the invention may also be used to prevent and/or treat disorders characterized by acute pulmonary vasoconstriction such as may result from pneumonia, traumatic injury, aspiration or inhalation injury, fat embolism in the lung, acidosis inflammation of the lung, adult respiratory distress syndrome, acute pulmonary edema, acute mountain sickness, post-cardiac surgery, acute pulmonary hypertension, persistent pulmonary hypertension of the newborn, perinatal aspiration syndrome, hyaline membrane disease, acute pulmonary thromboembolism, herapin-protamine reactions, sepsis, status asthmaticus or hypoxia (including iatrogenic hypoxia) and other forms of reversible pulmonary vasoconstriction. Such pulmonary disorders also are also characterized by inflammation of the lung including those associated with the migration into the lung of nonresident cell types including the various leucocyte subclasses. Also included in the respiratory disorders contemplated are: bullous disease, cough, chronic cough associated with inflammation or iatrogenic induced, airway constriction, pigeon fancier's disease, eosinophilic bronchitis, asthmatic bronchitis, chronic bronchitis with airway obstruction (chronic obstructive bronchitis), eosinophilic lung disease, emphysema, farmer's lung, allergic eye diseases (including allergic conjunctivitis, vernal conjunctivitis, vernal keratoconjunctivitis, and giant papillary conjunctivitis), idiopathic pulmonary fibrosis, cystic fibrosis, diffuse pan bronchiolitis and other diseases which are characterized by inflammation of the lung and/or excess mucosal secretion. Other physiological events which are contemplated to be prevented, treated or controlled include platelet activation in the lung, chronic inflammatory diseases of the lung which result in interstitial fibrosis, such as interstitial lung diseases (ILD) (e.g., idiopathic pulmonary fibrosis, or ILD associated with rheumatoid arthritis, or other autoimmune conditions), chronic obstructive pulmonary disease (COPD)(such as irreversible COPD), chronic sinusitis, fibroid lung, hypersensitivity lung diseases, hypersensitivity

pneumonitis, idiopathic interstitial pneumonia, nasal congestion, nasal polyposis, and otitis media.

The peptides and agonists of the invention can be used alone or in combitherapy to prevent or treat: retinopathy, nephropathy, diabetic angiopathy, and edema formation

The peptides and agonists of the invention can be used alone or in combitherapy to prevent or treat neurological disorders, for example, headache, migraines, anxiety, stress, cognitive disorders, cerebral ischemia, brain trauma, movement disorders, aggression, psychosis, seizures, panic attacks, hysteria, sleep disorders, depression, schizoaffective disorders, sleep apnea, attention deficit syndromes, memory loss, dementia, memory and learning disorders as discussed in Moncada and Higgs 1995 FASEB J. 9:1319-1330; Severina 1998 Biochemistry 63:794; Lee et al. 2000 PNAS 97: 10763-10768; Hobbs 1997 TIPS 18:484-491; Murad 1994 Adv. Pharmacol. 26:1-335; and Denninger et al. 1999 Biochim. Biophys. Acta 1411:334-350 and narcolepsy. They may also be used as a sedative.

The peptides and detectably peptides and agonists of the invention can be used as markers to identify, detect, stage, or diagnosis diseases and conditions of small intestine, including, without limitation: Crohn's disease, colitis, inflammatory bowel disease, tumors, benign tumors, such as benign stromal tumors, adenoma, angioma, adenomatous (pedunculated and sessile) polyps, malignant, carcinoid tumors, endocrine cell tumors, lymphoma, adenocarcinoma, foregut, midgut, and hindgut carcinoma, gastroinstestinal stromal tumor (GIST), such as leiomyorna, cellular leiomyoma, leiomyoblastoma, and leiomyosarcoma, gastrointestinal autonomic nerve tumor, malabsorption syndromes, celiac diseases, diverticulosis, Meckel's diverticulum, colonic diverticula, megacolon, Hirschsprung's disease, irritable bowel syndrome, mesenteric ischemia, ischemic colitis, colorectal cancer, colonic polyposis, polyp syndrome, intestinal adenocarcinoma, Liddle syndrome, Brody myopathy, infantile convulsions, and choreoathetosis

The peptides and agonists of the invention can be conjugated to another molecule (e.g., a diagnostic or therapeutic molecule) to target cells bearing the GC-C receptor, e.g., cystic fibrosis lesions and specific cells lining the intestinal tract. Thus, they can be used to target radioactive moieties or therapeutic moieties to the intestine to aid in imaging and diagnosing or treating colorectal/metastasized or local colorectal cancer and to deliver normal copies of the p53 tumor suppressor gene to the intestinal tract. The peptides and agonists of the invention can also be used to increase the number of GC-C molecules on the surface of a cell. In some embodiments the cell is a metastasized colorectal cancer cell. In one embodiment the peptide or agonist of the invention is therapeutically conjugated to a second agent. In certain embodiments, the second agent can be radioactive or radiostable. In certain embodiments the second agent can be selected from the group consisting of a compound that causes cell death, a compound that inhibits cell division, a compound that induces cell differentiation, a chemotherapeutic, a toxin and a radiosensitizing agent. In certain embodiments the second agent can be selected from the group consisting of: methotrexate, doxorubicin, daunorubicin, cytosinarabinoside, etoposide, 5-4 fluorouracil, melphalan, chlorambucil, cis-platin, vindesine, mitomycin, bleomycin, purothionin, macromomycin, 1,4-benzoquinone derivatives, trenimon, ricin, ricin A chain, Pseudomonas exotoxin, diphtheria toxin, Clostridium perfringens phospholipase C, bovine pancreatic ribonuclease, pokeweed antiviral protein, abrin, abrin A chain, cobra venom factor, gelonin, saporin, modeccin, viscumin, volkensin, nitroimidazole, metronidazole and misonidazole.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat inner ear disorders, e.g., to prevent and/or treat Meniere's disease (including symptoms thereof such as vertigo, hearing loss, tinnitus, sensation of fullness in the ear), Mal de débarquement syndrome, otitis externa, otitis media, otorrhea, acute mastoiditis, otosclerosis, otic pain, otic bleeding, otic inflammation, Lermoyez's syndrome, vestibular neuronitis, benign paroxysmal positional vertigo (BPPV), herpes zoster oticus, Ramsay Hunt's syndrome, herpes, labyrinthitis, purulent labyrinthitis, perilymph fistulas, presbycusis, ototoxicity (including drug-induced ototoxicity), neuromias (including acoustic neuromas), aerotitis media, infectious myringitis, bullous myringitis, squamous cell carcinoma, basal cell

carcinoma, pre-cancerous otic conditions, nonchromaffin paragangliomas, chemodectomas, glomus jugulare tumors, glomus tympanicum tumors, perichondritis, aural eczematoid dermatitis, malignant external otitis, subperichondrial hematoma, ceruminomas, impacted cerumen, sebaceous cysts, osteomas, keloids, otalgia, tinnitus, tympanic membrane infection, tympanitis, otic furuncles, petrositis, conductive and sensorineural hearing loss, epidural abscess, lateral sinus thrombosis, subdural empyema, otitic hydrocephalus, Dandy's syndrome, bullous myringitis, diffuse external otitis, foreign bodies, keratosis obturans, otic neoplasm, otomycosis, trauma, acute barotitis media, acute eustachian tube obstruction, postsurgical otalgia, cholesteatoma, infections related to an otic surgical procedure, and complications associated with any of said disorders. The peptides and agonists of the invention can be used alone or in combination therapy to maintain fluid homeostasis in the inner ear. neuronitis (including viral neuronitis), ganglionitis, geniculate

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat disorders associated with fluid and sodium retention, e.g., diseases of the electrolyte-water/electrolyte transport system within the kidney, gut and urogenital system, congestive heart failure, hypertension, hypotension, salt dependent forms of high blood pressure, hepatic edema, and liver cirrhosis. In addition they can be used to facilitate diuresis or control intestinal fluid. The peptides and agonists of the invention can also be used to treat disorders where there is abnormal proliferation of epithelial cells within the kidney (e.g. as in the case of renal cancer).

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat kidney disease. "Kidney disease" includes renal failure (including acute renal failure), renal insufficiency, nephrotic edema, glomerulonephritis, pyelonephritis, kidney failure, chronic renal failure, nephritis, nephrosis, azotemia, uremia, immune renal disease, acute nephritic syndrome, rapidly progressive nephritic syndrome, nephrotic syndrome, Berger's Disease, chronic nephritic/proteinuric syndrome, tubulointerstital disease, nephrotoxic disorders, renal infarction, atheroembolic renal disease, renal cortical necrosis, malignant nephroangiosclerosis, renal vein thrombosis, renal tubular acidosis, renal glucosuria,

nephrogenic diabetes insipidus, Bartter's Syndrome, Liddle's Syndrome, polycystic kidney disease, medullary cystic disease, medullary sponge kidney, hereditary nephritis, and nail-patella syndrome, along with any disease or disorder that relates to the renal system and related disorders, as well as symptoms indicative of, or related to, renal or kidney disease and related disorders.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent or treat polycystic kidney disease. Polycystic kidney disease" "PKD" (also called "polycystic renal disease") refers to a group of disorders characterized by a large number of cysts distributed throughout dramatically enlarged kidneys. The resultant cyst development leads to impairment of kidney function and can eventually cause kidney failure. "PKD" specifically includes autosomal dominant polycystic kidney disease (ADPKD) and recessive autosomal recessive polycystic kidney disease (ARPKD), in all stages of development, regardless of the underlying cause.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat disorders associated with bicarbonate secretion, e.g., Cystic Fibrosis.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat disorders associated with bile secretion. In addition, they can be used to facilitate or control chloride and bile fluid secretion in the gall bladder.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat disorders associated with liver cell regeneration. This may include administration of the peptides and agonists to liver transplant recipients and to patients with drug or alcohol induced-liver damage. Furthermore, the peptides and agonists may be useful to treat liver damage as in the case of viral mediated hepatitis. The peptides and agonists of the invention may be used alone or in combination to prevent and/or treat liver abscess, liver cancer (either primary or metastatic), cirrhosis (such as cirrhosis caused by the alcohol consumption or primary biliary cirrhosis), amebic liver abscess, autoimmune hepatitis, biliary

atresia, coccidioidomycosis disseminated, δ agent (hepatitis δ), hemochromatosis, hepatitis a, hepatitis b, hepatitis c, or any other acute, subacute, fulminant or chronic hepatitis of viral, metabolic or toxic etiology, hepatocellular carcinoma, pyogenic liver abscess, Reye's syndrome, sclerosing cholangitis, Wilson's disease, drug induced hepatotoxicity, or fulminant or acute liver failure. The peptides and agonists may be used in stimulating hepatic regeneration after surgical hepatectomy.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat myocardial infraction, diastolic dysfunction, angina pectoris, stable, unstable and variant (Prinzmetal) angina, atherosclerosis, thrombosis, endothelial dysfunction, cardiac edema, stroke, conditions of reduced blood vessel patency, e.g., postpercutaneous transluminal coronary angioplasty (post-PTCA) and peripheral vascular disease.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat glaucoma.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat immunodeficiency.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat bladder outlet obstruction and incontinence.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat male (e.g. erectile dysfunction) or female sexual dysfunction, premature labor, and dysmenorrhoea. In certain embodiments they can be used in combination with a phosphodiesterase inhibitor.

The peptides and agonists of the invention can be used alone or in combination therapy to prevent and/or treat osteopenia disorders (bone loss disorders). "Bone loss disorders" include conditions and diseases wherein the inhibition of bone loss and/or the promotion of bone formation is desirable. Among such conditions and diseases are osteoporosis, osteomyelitis, Paget's disease (osteitis deformans), periodontitis, hypercalcemia, osteonecrosis, osteosarcoma, osteolyic metastases, familial expansile osteolysis, prosthetic loosening, periprostetic osteolysis, bone loss attendant rheumatoid arthritis, and cleiodocranial dysplasia (CCD). Osteoporosis includes primary osteoporosis, endocrine osteoporosis (hyperthyroidism, hyperparathyroidism, Cushing's syndrome, and acromegaly), hereditary and congenital forms of osteoporosis (osteogenesis imperfecta, homocystinuria, Menkes' syndrome, and Rile-Day syndrome) and osteoporosis due to immobilization of extremitiesosteomyelitis, or an infectious lesion in bone leading to bone loss. The peptides and agonists can be used alone or in combination therapy to stimulating bone regeneration. The bone regeneration may be following reconstruction of bone defects in cranio-maxillofacial surgery, or following an implant into bone, for example a dental implant, bone supporting implant, or prosthesis. The bone regeneration may also be following a bone fracture.

The peptides of the invention that have homology to ST peptides can be used as immunogens to treat and/or prevent one or more disease symptoms associated with traveler's diarrhea. The methods described in US20040146534, US4220584, US4285391, US5182109, US4603049, US4545931, US4886663, and WO08402700 can be similarly used to create immunogens comprising the peptides of the invention.

What is claimed is:

1. A peptide comprising the amino acid sequence of SEQ ID NO:3.

2. A method comprising chemically synthesizing the peptide of claim 1 and purifying the peptide.

3. The peptide of claim 1 wherein the peptide is recombinantly produced.

4. The peptide of claim 1 wherein the peptide is chemically synthesized.

5. An isolated nucleic acid molecule encoding the peptide of claim 1.

6. A vector comprising the nucleic acid molecule of claim 5

7. An isolated cell comprising the isolated nucleic acid molecule of claim 5.

8. A method for treating a patient for a gastrointestinal disorder comprising administering a composition comprising the peptide of claim 1.

9. A method for increasing GCC receptor activity comprising adiministering the peptide of claim 1.

Figure 1. LCMS analysis of recombinant peptide variants

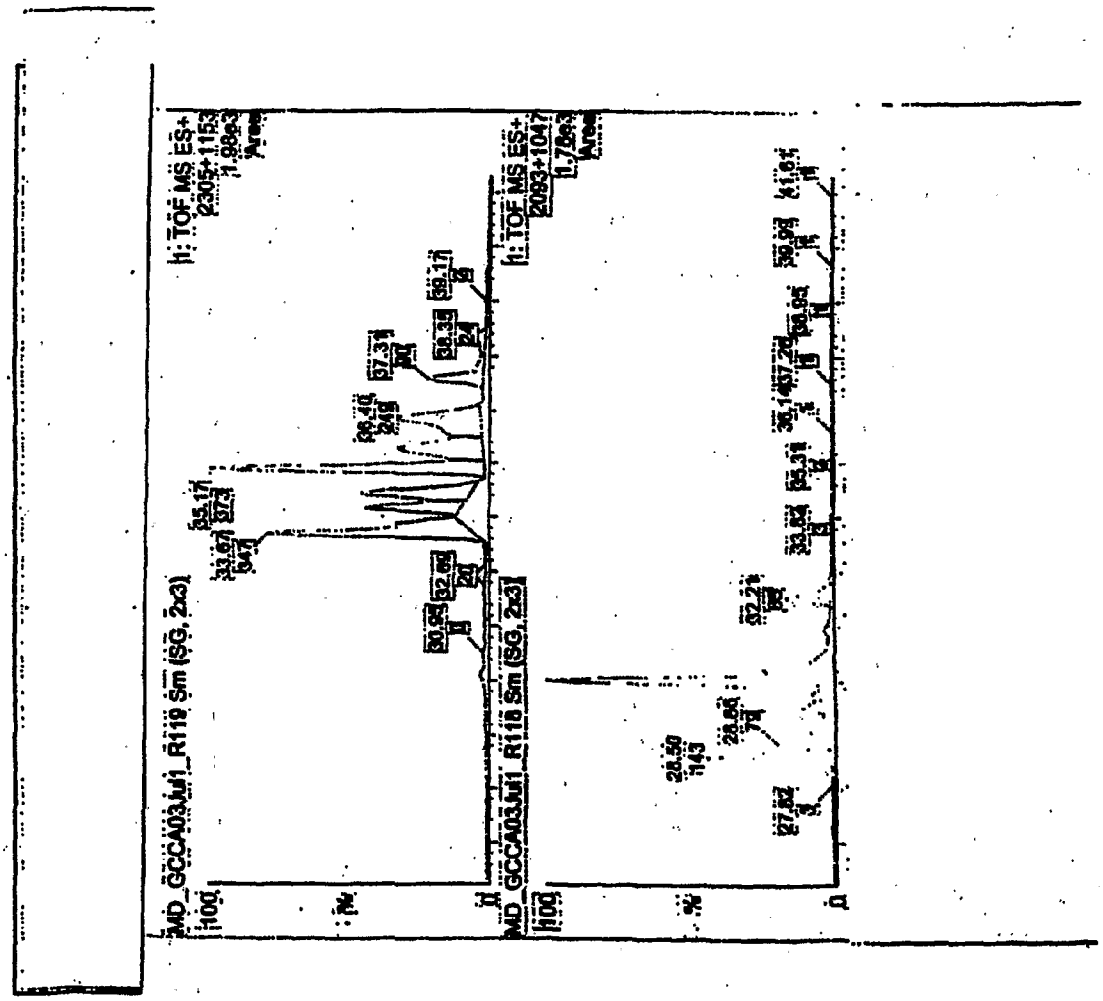


Figure 1b: LCMS analysis of synthetic SEQ ID NO: 3 (Total Ion Chromatograph (TIC))

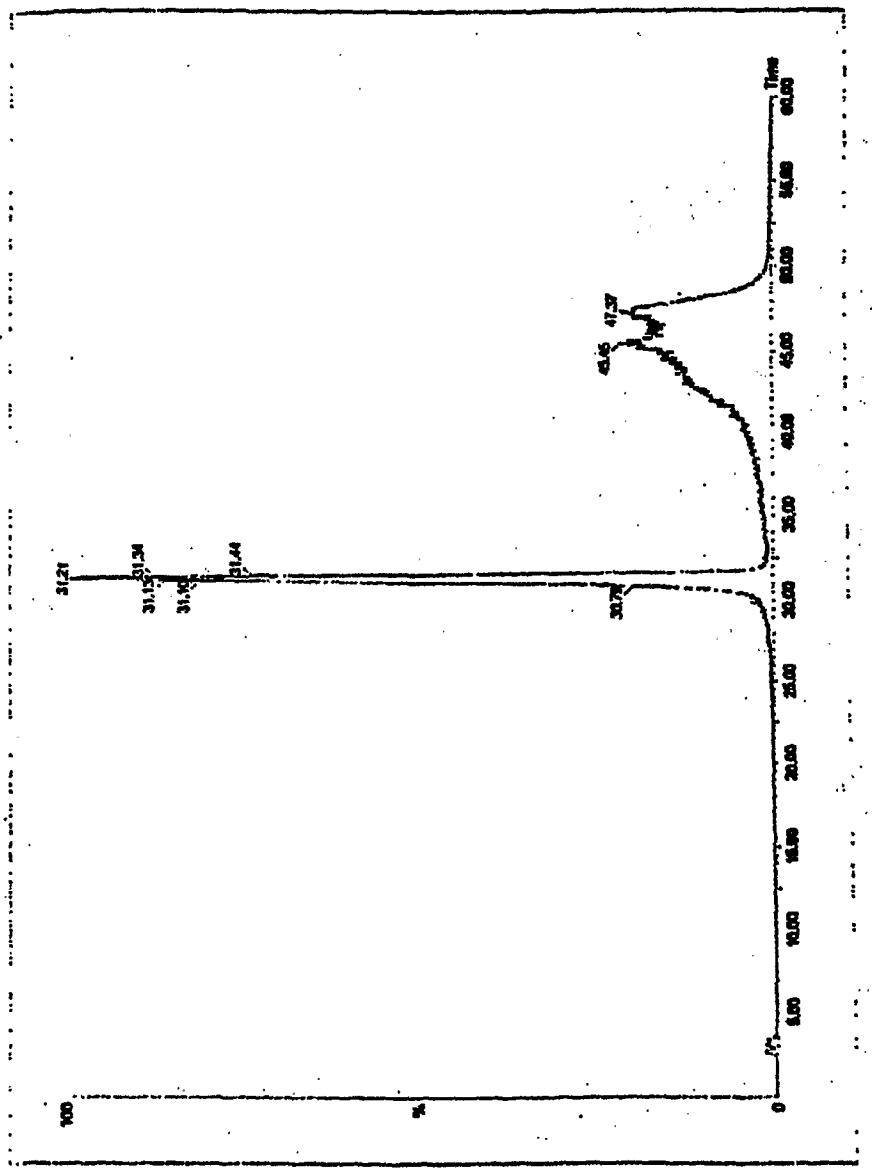


Figure 1c: LCMS analysis (Total Ion Chromatograph of blank used in SEQ ID NO:3 analysis)

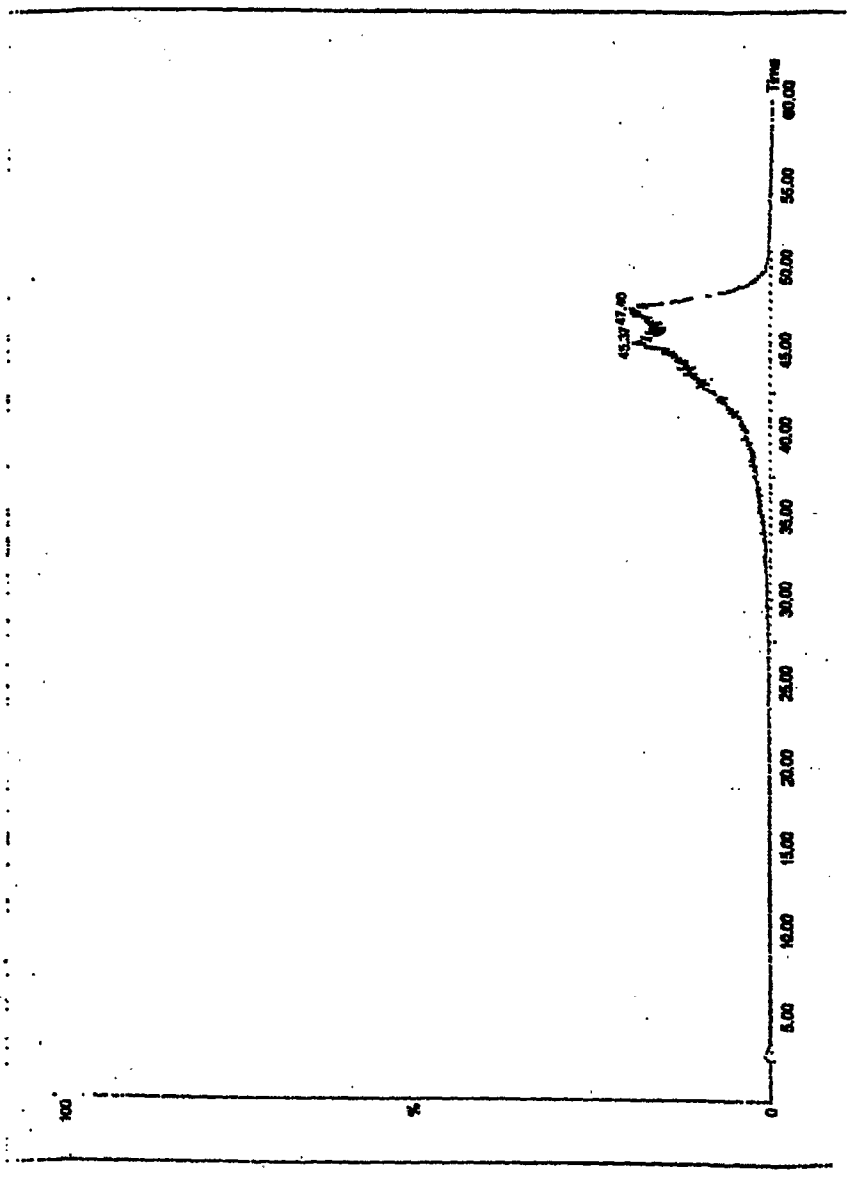


Figure 2. Chemically synthesized peptides in the Intestinal GC-C Receptor Activity Assay

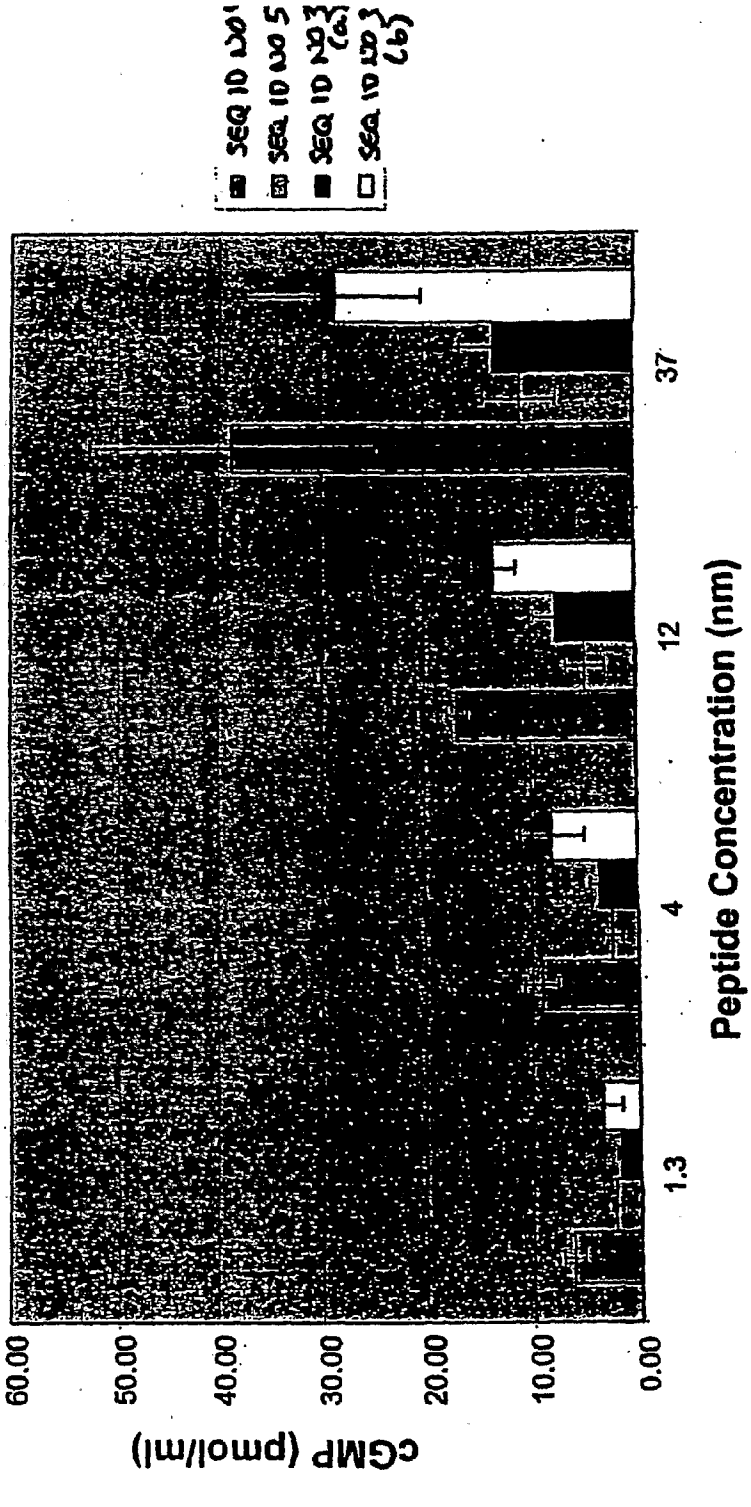


Figure 3a. Seq ID NO:4 vs Zelnorm® in an acute Mouse Gastrointestinal Transit Model (GIT)

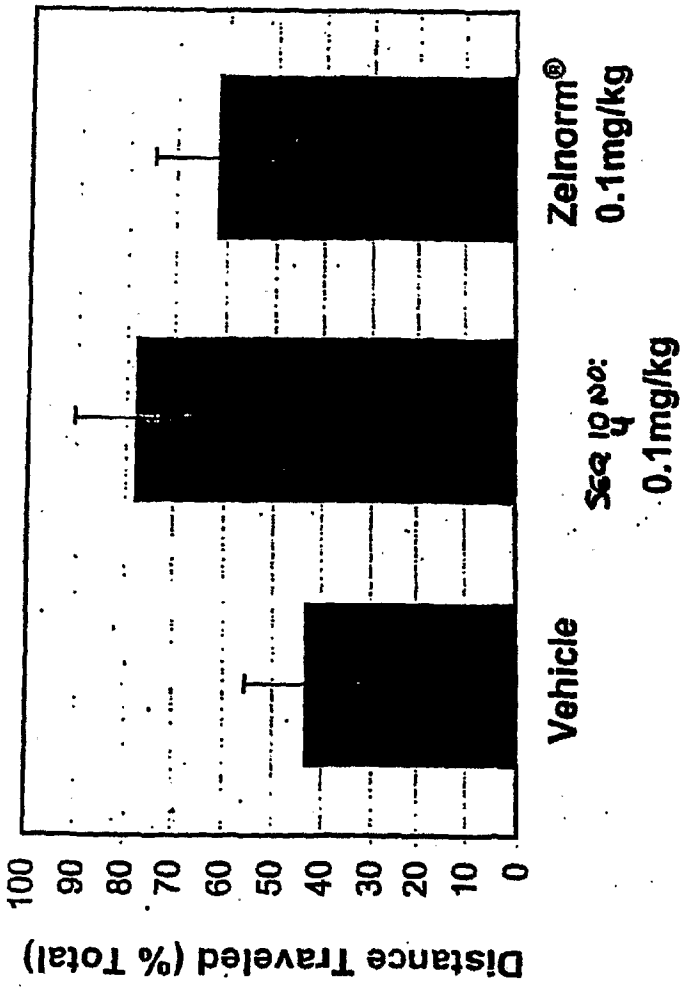


Figure 3b: Seq ID NO: 3 vs. Zelnorm® in an acute Mouse Gastrointestinal Transit Model

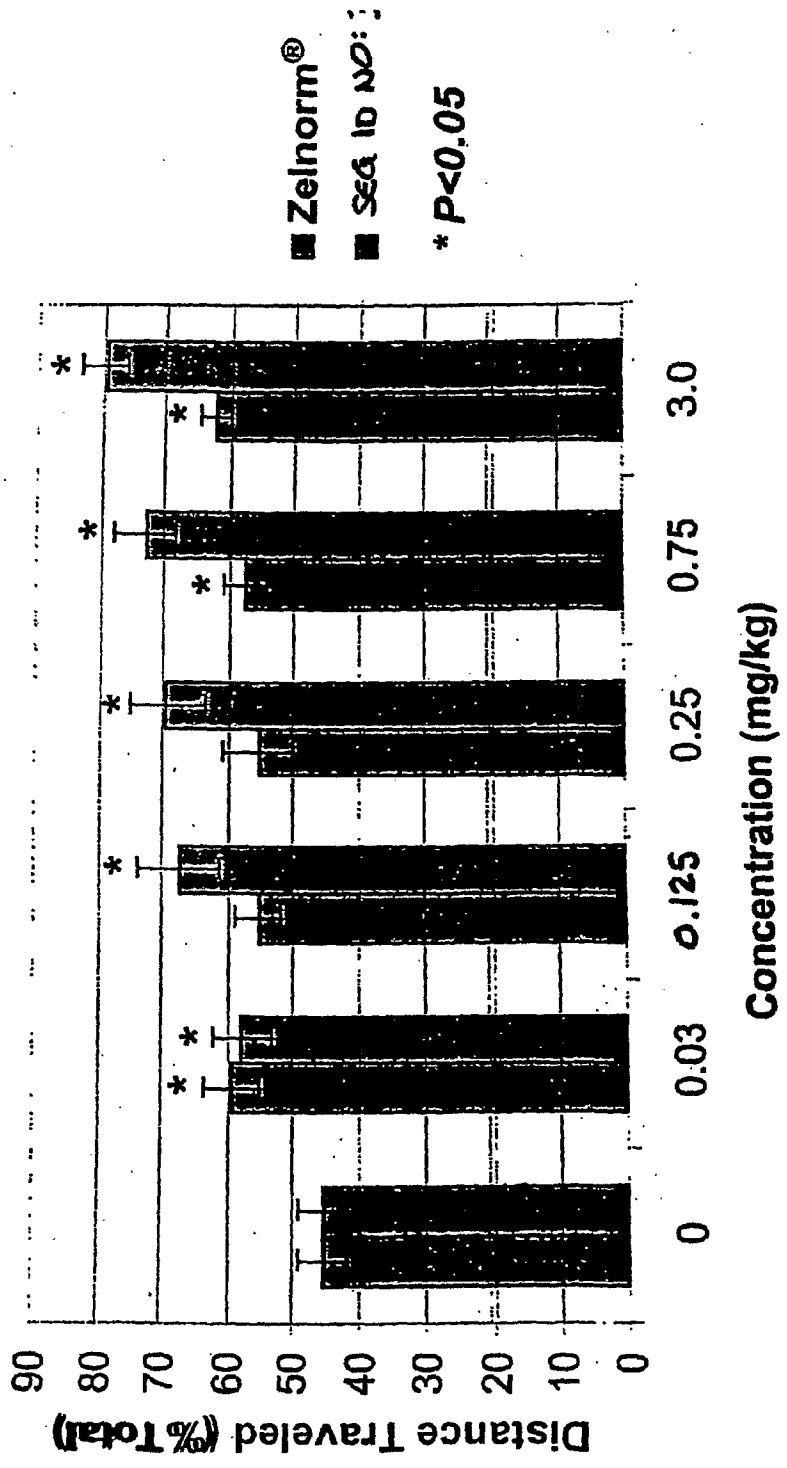


Figure 4a. Purified MD-915 and MM-416776 in GIT Model

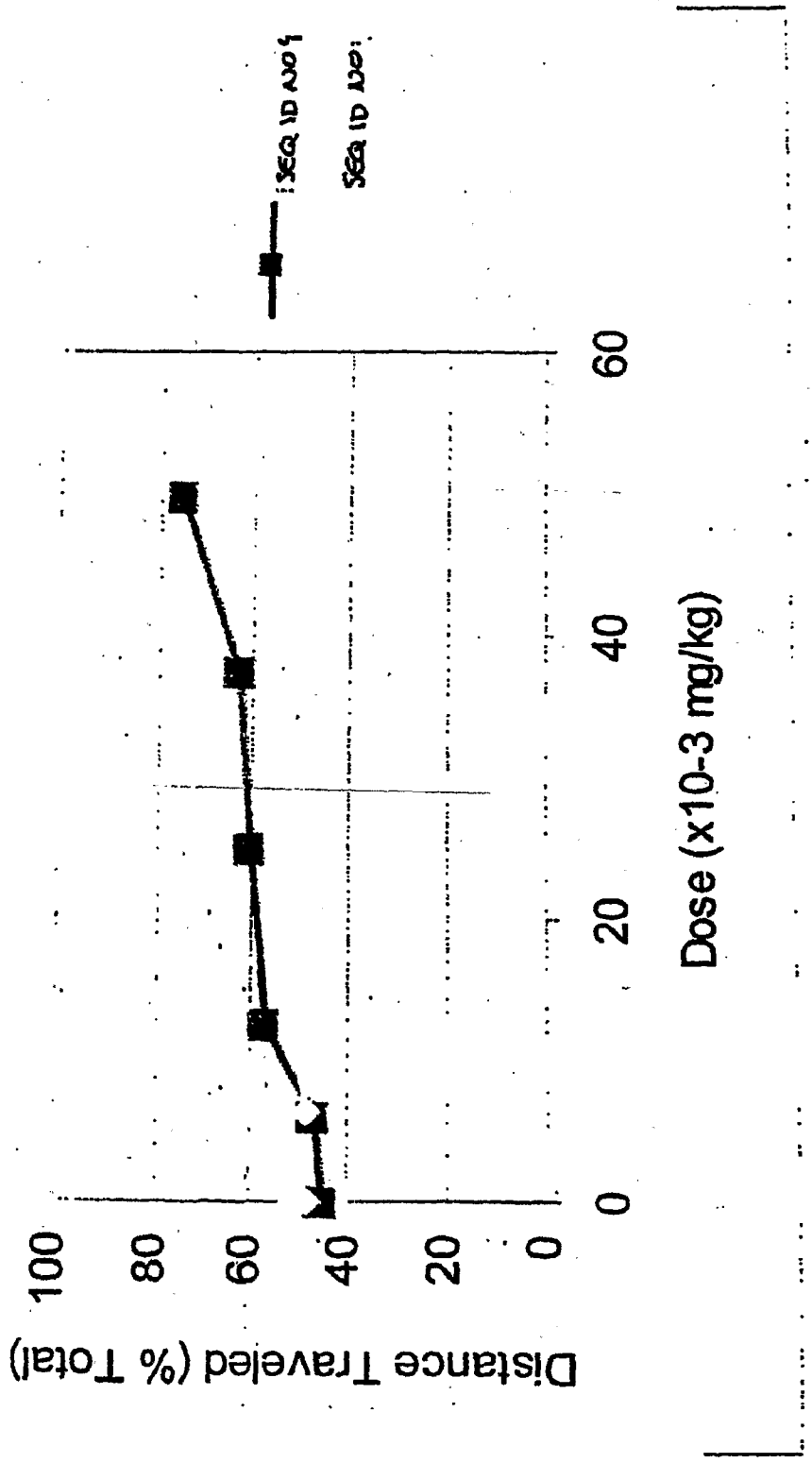
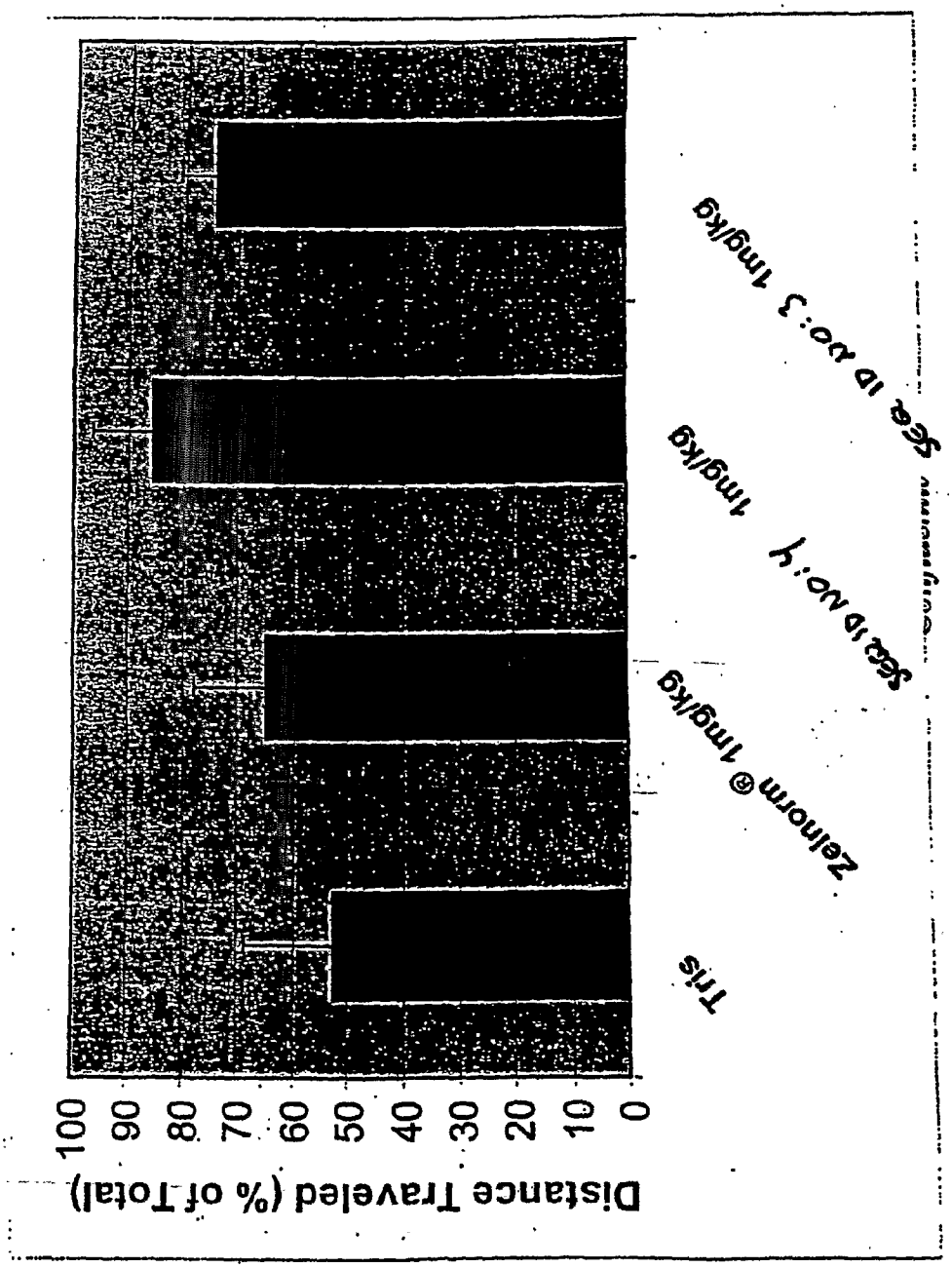


Figure 4b. Chemically Synthesized Peptides in GIT Model



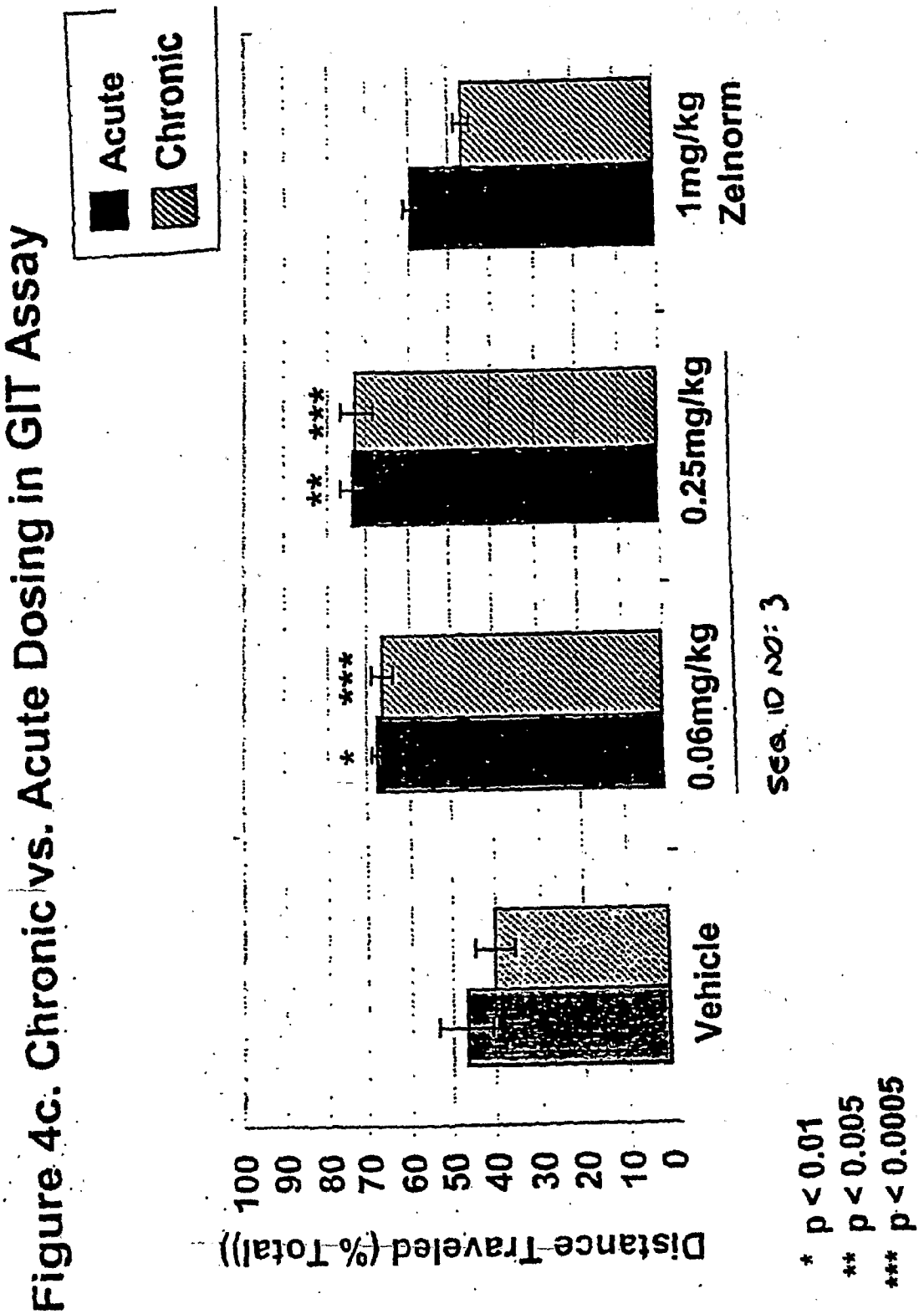


Figure 4c. Chronic vs. Acute Dosing in GIT Assay
Acute
Chronic
Distance Traveled (% Total))
100
90
80
70
60
50
40
30
20
10
0
Vehicle
0.06mg/kg
0.25mg/kg
1mg/kg Zelnorm
Seq. ID NO: 3
* p < 0.01
** p < 0.005
*** p < 0.0005

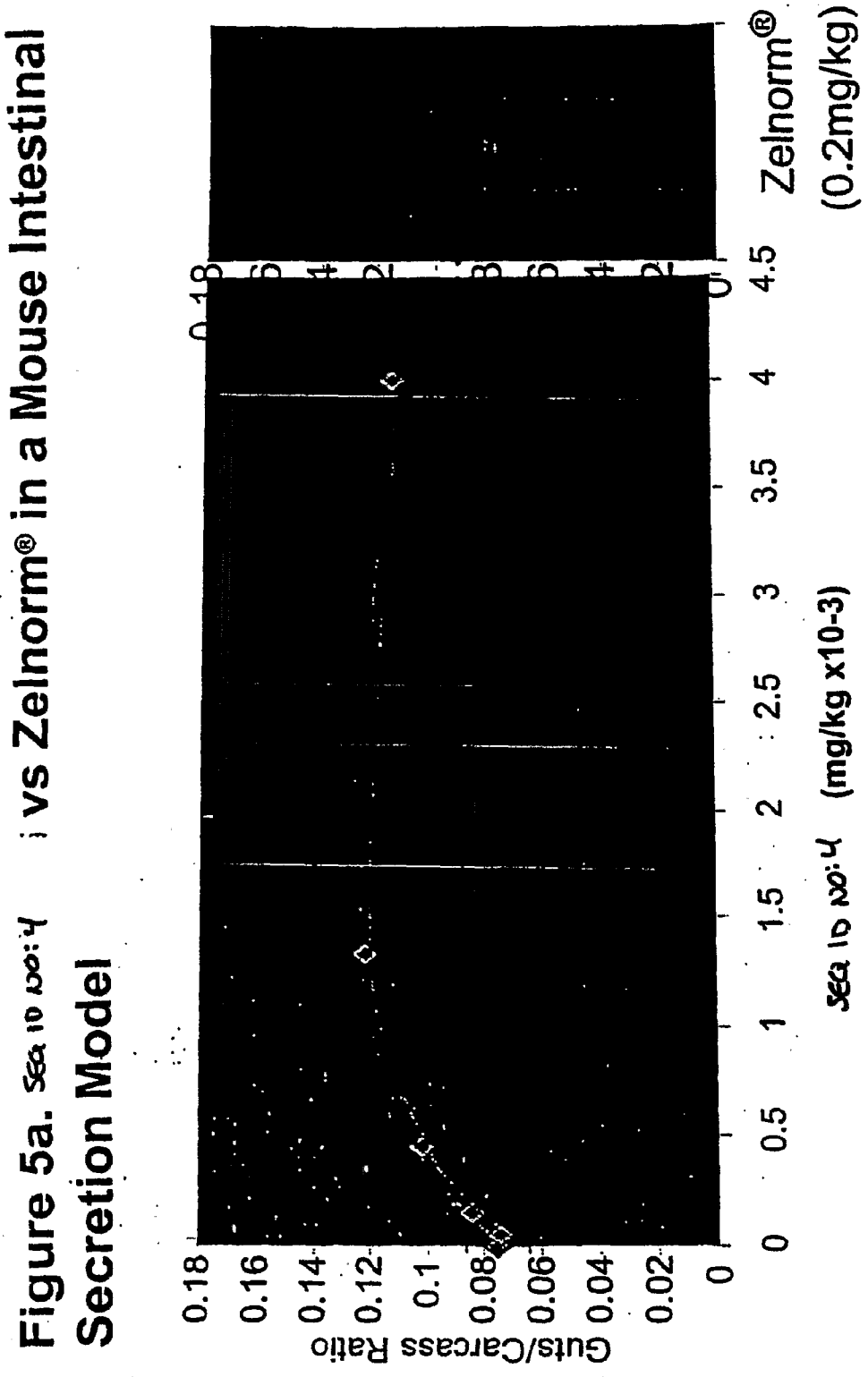


Figure 5a. Seq ID NO:4 vs Zelnorm® in a Mouse Intestinal Secretion Model

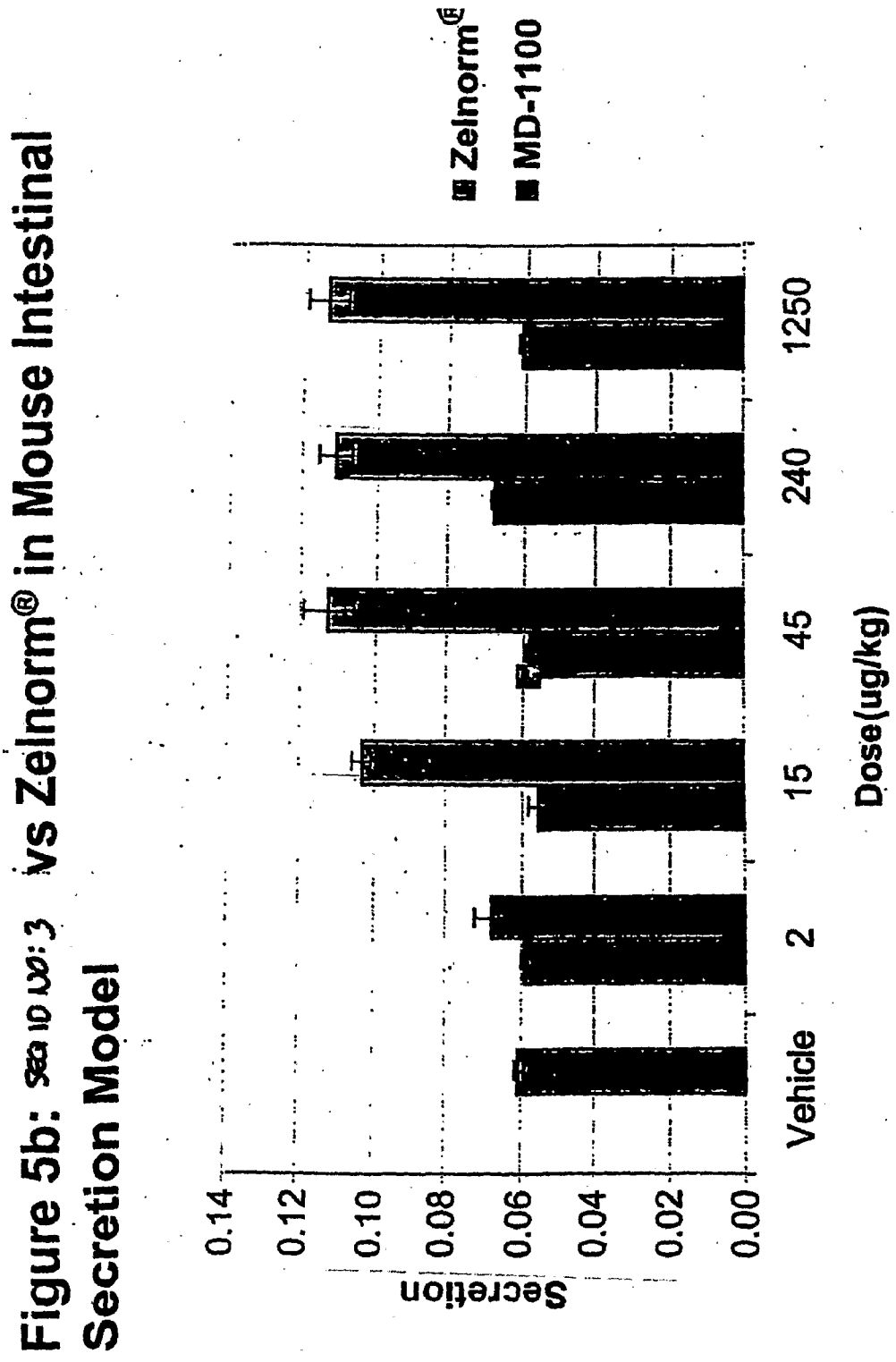


Figure 5b: SEQ ID NO: 3 vs Zelnorm® in Mouse Intestinal Secretion Model
Zelnorm®
MD-1100
Secretion
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Vehicle
2
15
45
240
1250
Dose(ug/kg)

Figure 6a. Recombinantly generated SEQ ID NO:5 and SEQ ID NO:4 in Mouse Intestinal Secretion Model

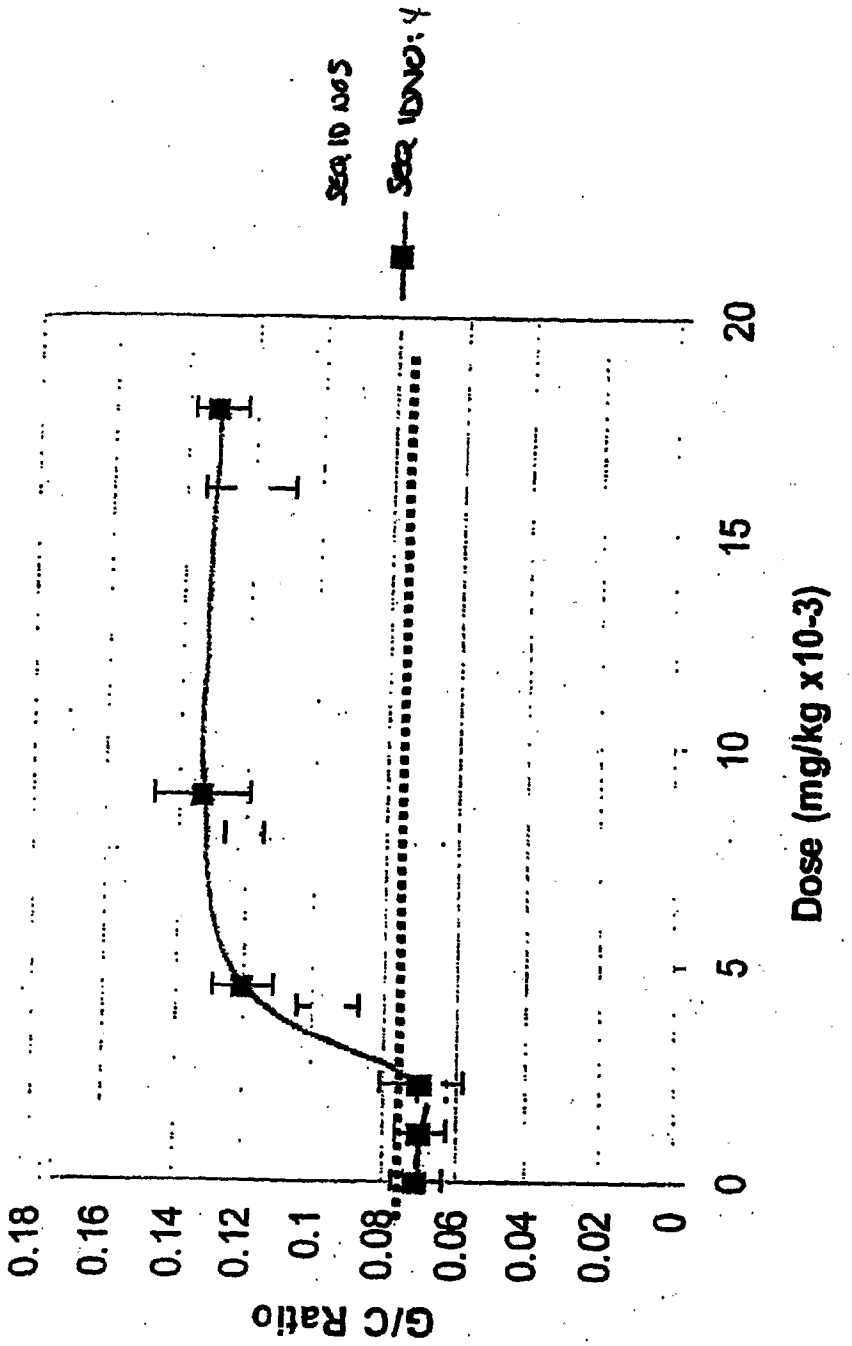


Figure 6b. Chemically synthesized peptides in Mouse Intestinal Secretion Model

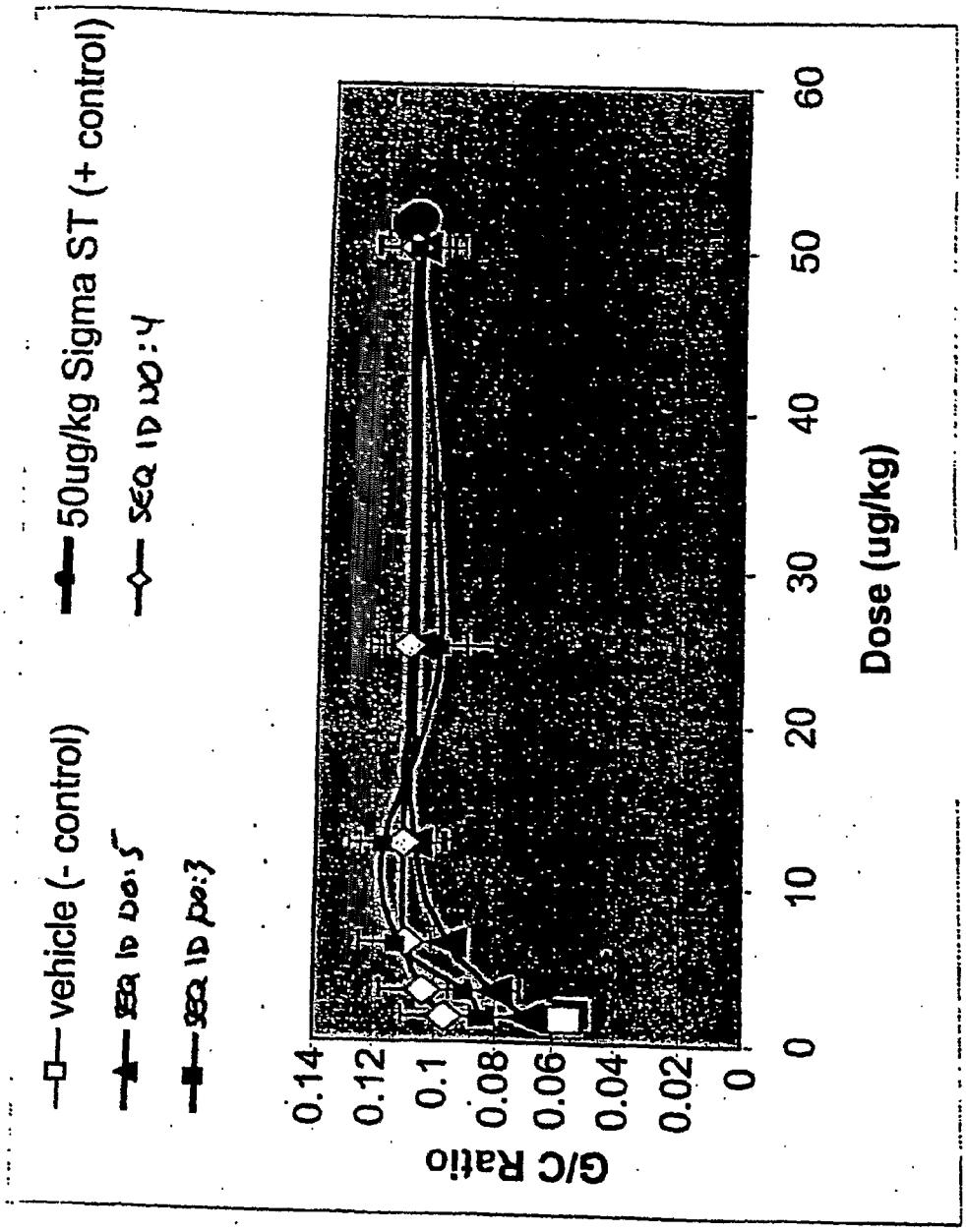
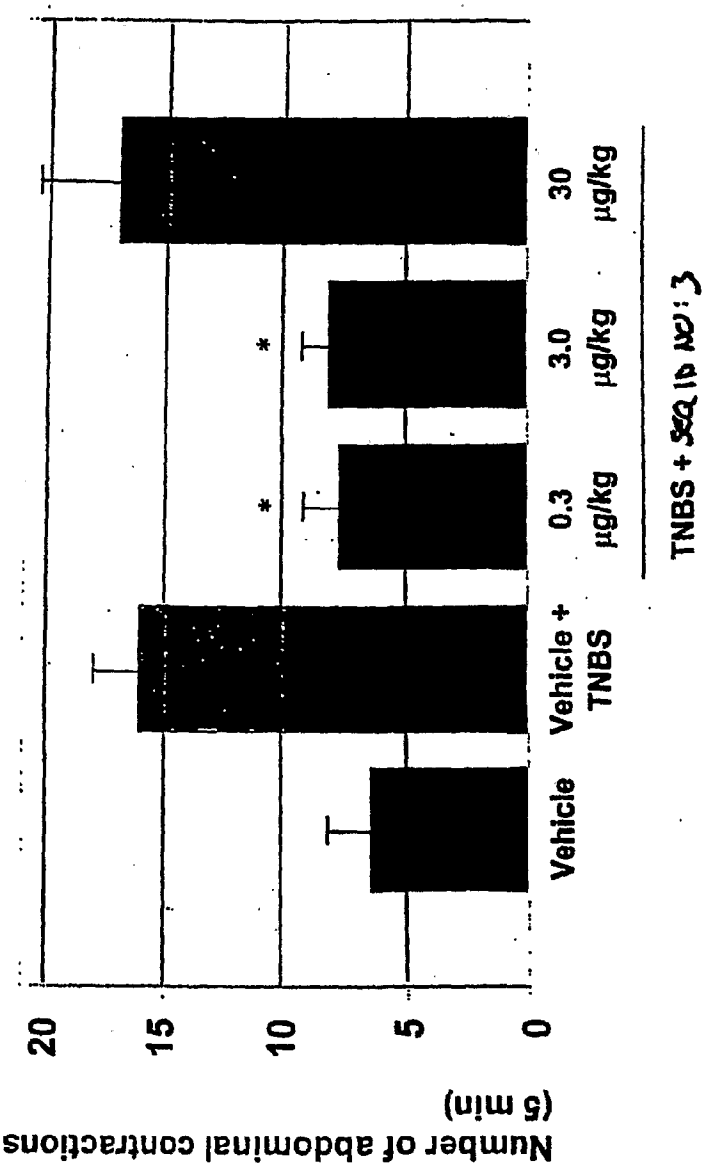


Figure 7: Effect of SEQ ID NO: 3 in a rat TNBS Colorectal Distention Assay



* p<0.05 as compared to "vehicle" value

Figure 8a: Visceral Antinociceptive Effects of SEQ ID NO: 5 in a Mouse Writhing Assay

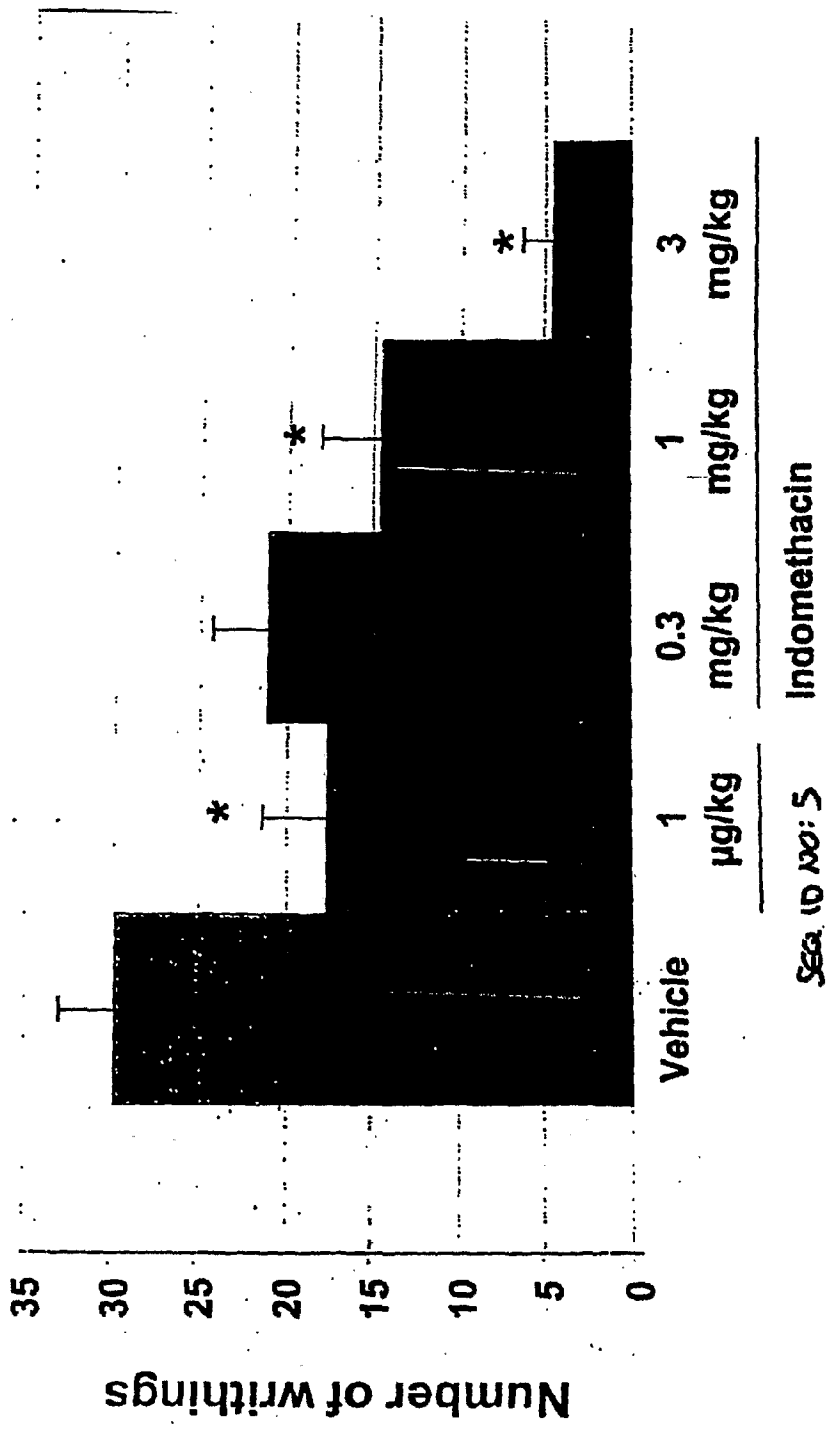
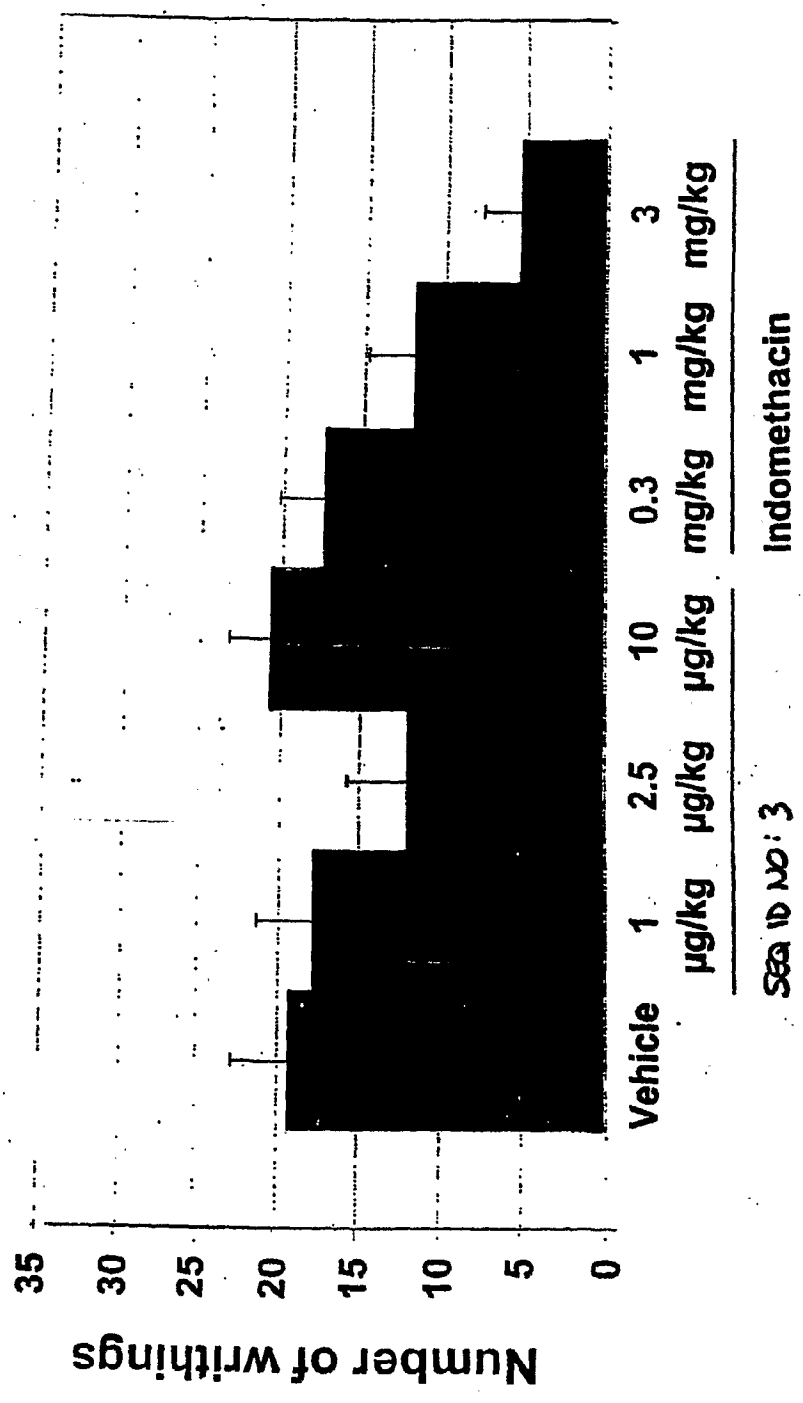


Figure 8b: Visceral Antinociceptive Effects of SEQ ID NO: 3 in a Mouse Writhing Assay



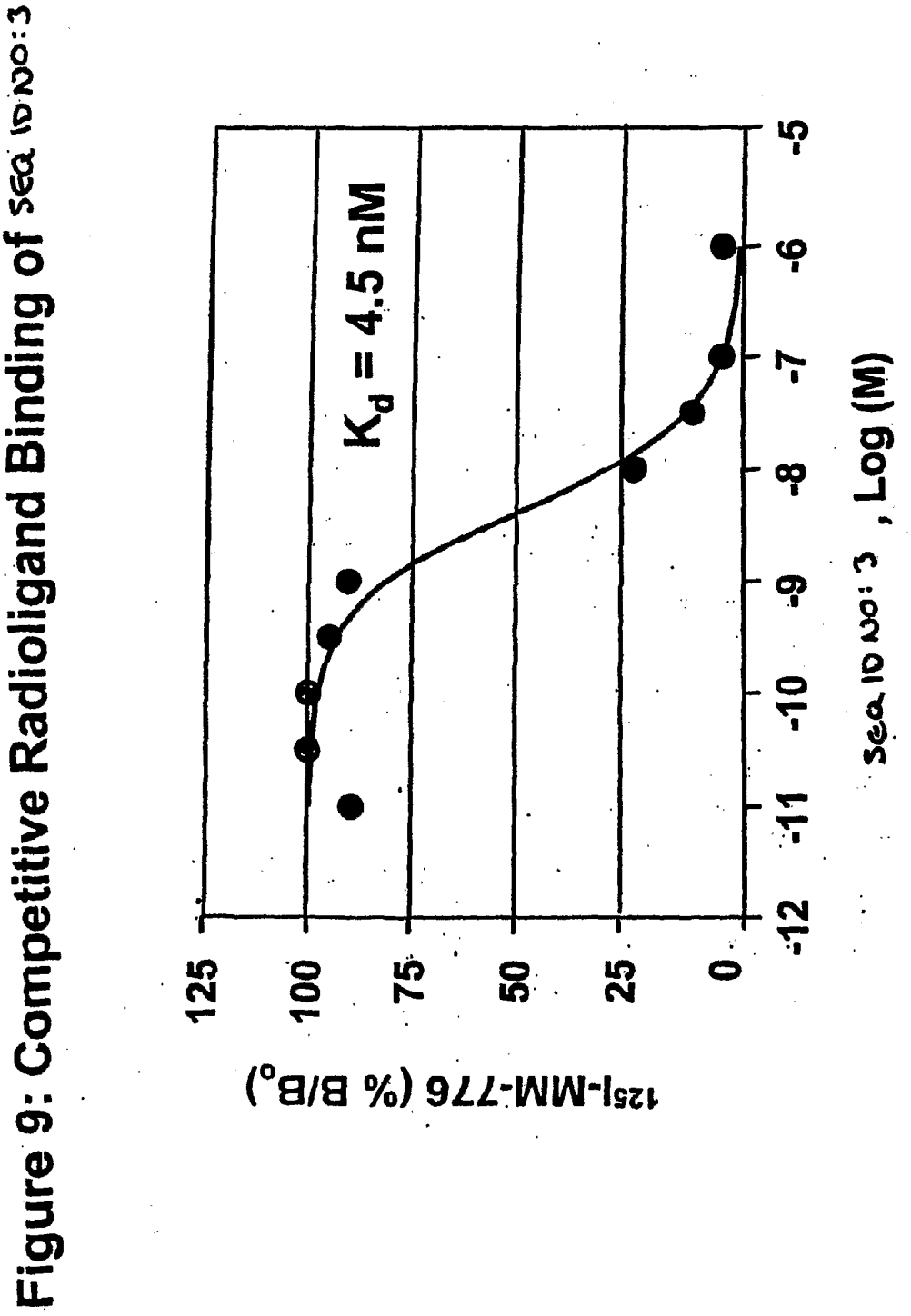
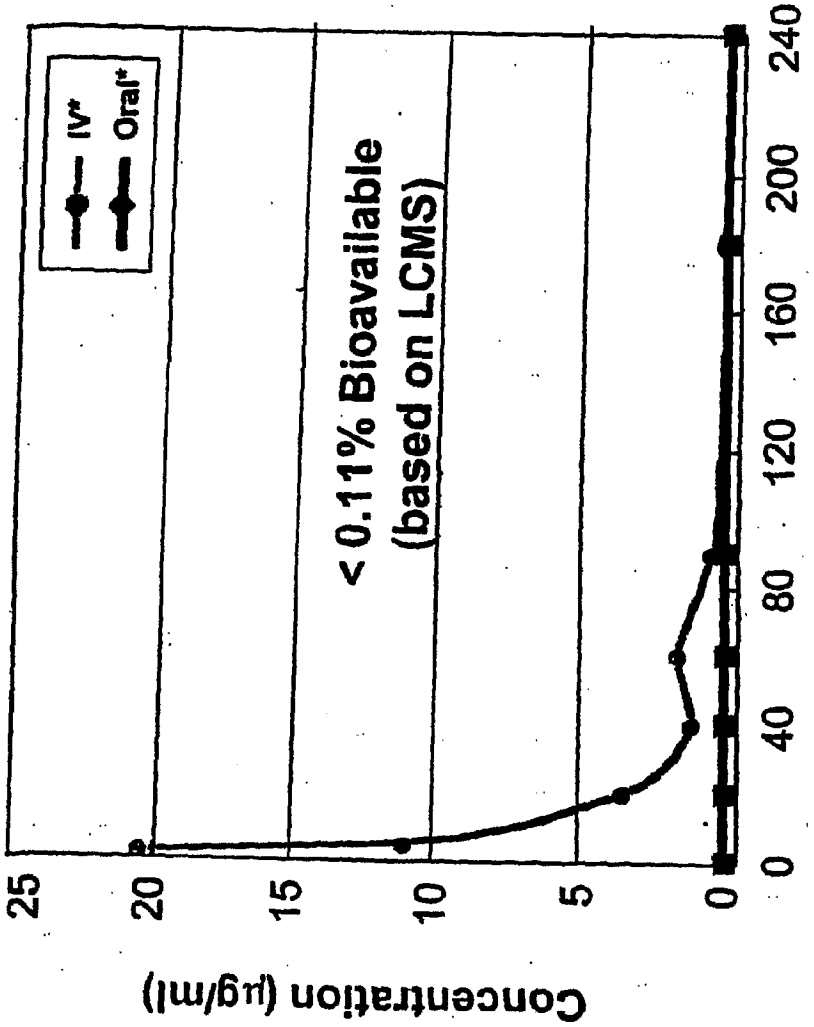


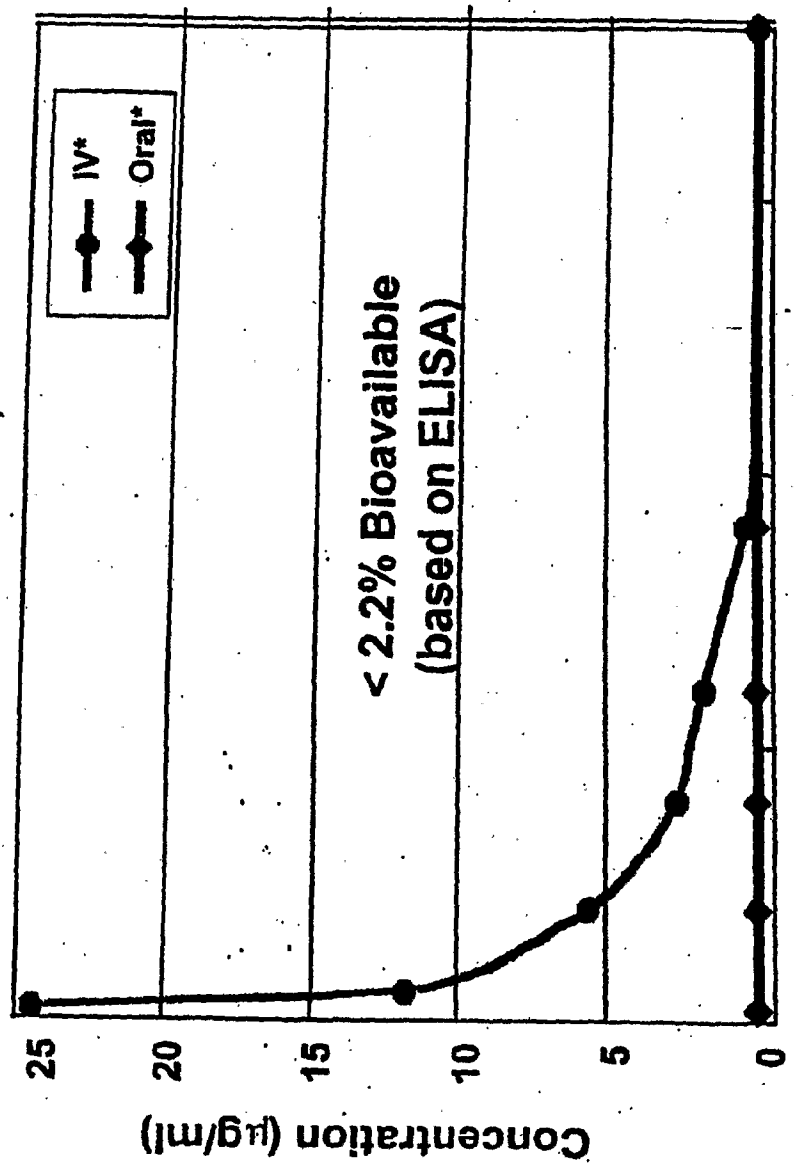
Figure 9: Competitive Radioligand Binding of SEQ ID NO:3
K_d = 4.5 nM
^{125}I-MM-776 (% B/B$_o$)
125
100
75
50
25
0
-5
-6
-7
-8
-9
-10
-11
-12
SEQ ID NO: 3 , Log (M)

Figure 10a: Minimum Systemic Absorption of SEQ ID NO: 3 (based on LCMS)



* Limit of detection 0.00063 µg/mL (0.6 nM)
* Dosing at 10 mg/kg

Figure 10b: Minimum Systemic Absorption of SEQ ID NO:3 (based on ELISA)



* Limit of detection 0.061 µg/ml (40 nM)
Dosing at 10 mg/kg

FIG. 11 (sheet 1 of 3)

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:3)

Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys --- Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys --- --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys --- Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys --- Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys --- Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys --- Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys --- --- Cys Cys Asn Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys Thr --- Cys --- (SEQ ID NO;)
Cys Cys --- Tyr Cys Cys --- Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)

FIG. 11 (sheet 2 of 3)

Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys --- --- Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys --- Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys --- Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys --- --- Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu --- Cys Cys Asn Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro --- Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro --- Cys --- Gly Cys --- (SEQ ID NO:)

FIG. 11 (sheet 3 of 3)

Cys Cys Glu Tyr Cys Cys --- Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro --- Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys --- --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys --- Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys --- --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn --- Ala Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys --- --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro --- Cys Thr Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys --- Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys --- --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys --- --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys --- Gly Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr --- Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr --- Cys --- (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys --- (SEQ ID NO:)

FIG. 12 (sheet 1 of 33)

Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr. (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)

FIG. 12 (sheet 2 of 33)

Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Xaa’ Asn Pro Ala Cys Xaa’ Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Xaa’ Asn Pro Ala Cys Thr Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Xaa’ Asn Pro Ala Cys Thr Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Xaa’ Asn Pro Ala Cys Thr Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Xaa’ Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Xaa’ Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Ala Xaa’ Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Ala Cys Xaa’ Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Ala Cys Thr Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Ala Cys Thr Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Xaa’ Pro Ala Cys Thr Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Xaa’ Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Ala Xaa’ Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Ala Cys Xaa’ Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Ala Cys Thr Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Ala Cys Thr Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Xaa’ Ala Cys Thr Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Xaa’ Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Xaa’ Xaa’ Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Xaa’ Cys Xaa’ Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Xaa’ Cys Thr Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Xaa’ Cys Thr Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Xaa’ Cys Thr Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Xaa’ Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Xaa’ Xaa’ Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Xaa’ Thr Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Xaa’ Thr Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Xaa’ Thr Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa’ Xaa’ Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa’ Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa’ Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa’ Xaa’ Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa’ Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Xaa’ Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa’ Xaa’ Tyr (SEQ ID NO:)
Cys Cys Xaa’ Glu Xaa’ Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Glu Xaa’ Xaa’ Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa’ Glu Xaa’ Xaa’ Xaa’ Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 3 of 33)

Cys Cys Xaa' Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)

FIG. 12 (sheet 4 of 33)

Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 5 of 33)

Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 6 of 33)

Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Xaa' Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Xaa' Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Xaa' Asn Pro Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)

FIG. 12 (sheet 15 of 33)

Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Xaa' Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 17 of 33)

Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 19 of 33)

Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Xaa' Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr	(SEQ ID NO:)

FIG. 12 (sheet 21 of 33)

Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Xaa' Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Xaa' Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Xaa' Asn Xaa' Xaa' Xaa' Xaa' Pro Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 23 of 33)

Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Xaa' Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 24 of 33)

Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Xaa' Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Xaa' Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Xaa' Pro Ala Cys Thr Gly Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Xaa' Ala Cys Thr Gly Cys Tyr (SEQ ID NO:)

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Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Xaa' Ala Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 30 of 33)

Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Xaa' Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Xaa' Cys Thr Gly Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 31 of 33)

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Xaa' Cys Thr Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Xaa' Thr Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 32 of 33)

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
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Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Xaa' Thr Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Xaa' Gly Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)

FIG. 12 (sheet 33 of 33)

Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Xaa' Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Cys Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Cys Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)
Cys Cys Glu Tyr Cys Cys Asn Pro Ala Cys Thr Gly Xaa' Xaa' Xaa' Xaa' Tyr (SEQ ID NO:)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/07752

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : C07K 7/08
US CL : 514/14
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 514/14

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
West and STN

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US2004/0266989 A(Currie et al) 30 December 2004 (30.12.2004), abstract, page 27, and page 46, claim 17	1-9

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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(74) Agent: **MEIKLEJOHN, Anita L.**; Fish & Richardson P.C., P.o. Box 1022, Minneapolis, Minnesota 55440-1022 (US).

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[Continued on next page]

(54) Title: METHODS AND COMPOSITIONS FOR THE TREATMENT OF GASTROINTESTINAL DISORDERS

Pro Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys

Human Guanylin (SEQ ID NO:19)

--- Gly Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 96)
--- --- Thr Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 97)
--- --- --- Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 98)
--- --- --- Cys --- Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 99)
--- --- --- Cys Gly --- Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 100)
--- --- --- Cys Gly Glu --- Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 101)
--- --- --- Cys Gly Glu Ile Cys --- Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 102)
--- --- --- Cys Gly Glu Ile Cys Ala --- Ala Ala Cys Thr Gly Cys (SEQ ID NO: 103)
--- --- --- Cys Gly Glu Ile Cys Ala Tyr --- Ala Cys Thr Gly Cys (SEQ ID NO: 104)
--- --- --- Cys Gly Glu Ile Cys Ala Tyr Ala --- Cys Thr Gly Cys (SEQ ID NO: 105)
--- --- --- Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys --- Gly Cys (SEQ ID NO: 106)
--- --- --- Cys Gly Glu Ile Cys Ala Tyr Ala Ala Cys Thr --- Cys (SEQ ID NO: 107)
--- --- Thr Cys --- Glu Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 108)
--- --- Thr Cys --- --- Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 109)
--- --- Thr Cys --- Glu --- Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 110)
--- --- Thr Cys --- Glu Ile Cys --- Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 111)
--- --- Thr Cys --- Glu Ile Cys Ala --- Ala Ala Cys Thr Gly Cys (SEQ ID NO: 112)
--- --- Thr Cys --- Glu Ile Cys Ala Tyr --- Ala Cys Thr Gly Cys (SEQ ID NO: 113)
--- --- Thr Cys --- Glu Ile Cys Ala Tyr Ala --- Cys Thr Gly Cys (SEQ ID NO: 114)
--- --- Thr Cys --- Glu Ile Cys Ala Tyr Ala Ala Cys --- Gly Cys (SEQ ID NO: 115)
--- --- Thr Cys --- Glu Ile Cys Ala Tyr Ala Ala Cys Thr --- Cys (SEQ ID NO: 116)
--- --- Thr Cys Gly --- Ile Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 117)
--- --- Thr Cys Gly --- --- Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 118)
--- --- Thr Cys Gly --- Ile Cys --- Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 119)
--- --- Thr Cys Gly --- Ile Cys Ala --- Ala Ala Cys Thr Gly Cys (SEQ ID NO: 120)
--- --- Thr Cys Gly --- Ile Cys Ala Tyr --- Ala Cys Thr Gly Cys (SEQ ID NO: 121)
--- --- Thr Cys Gly --- Ile Cys Ala Tyr Ala --- Cys Thr Gly Cys (SEQ ID NO: 122)
--- --- Thr Cys Gly --- Ile Cys Ala Tyr Ala Ala Cys --- Gly Cys (SEQ ID NO: 123)
--- --- Thr Cys Gly --- Ile Cys Ala Tyr Ala Ala Cys Thr --- Cys (SEQ ID NO: 124)
--- --- Thr Cys Gly Glu --- Cys Ala Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 125)
--- --- Thr Cys Gly Glu --- Cys --- Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 126)
--- --- Thr Cys Gly Glu --- Cys Ala --- Ala Ala Cys Thr Gly Cys (SEQ ID NO: 127)
--- --- Thr Cys Gly Glu --- Cys Ala Tyr --- Ala Cys Thr Gly Cys (SEQ ID NO: 128)
--- --- Thr Cys Gly Glu --- Cys Ala Tyr Ala --- Cys Thr Gly Cys (SEQ ID NO: 129)
--- --- Thr Cys Gly Glu --- Cys Ala Tyr Ala Ala Cys --- Gly Cys (SEQ ID NO: 130)
--- --- Thr Cys Gly Glu --- Cys Ala Tyr Ala Ala Cys Thr --- Cys (SEQ ID NO: 131)
--- --- Thr Cys Gly Glu Ile Cys --- Tyr Ala Ala Cys Thr Gly Cys (SEQ ID NO: 132)
--- --- Thr Cys Gly Glu Ile Cys --- --- Ala Ala Cys Thr Gly Cys (SEQ ID NO: 133)
--- --- Thr Cys Gly Glu Ile Cys --- Tyr --- Ala Cys Thr Gly Cys (SEQ ID NO: 134)
--- --- Thr Cys Gly Glu Ile Cys --- Tyr Ala --- Cys Thr Gly Cys (SEQ ID NO: 135)
--- --- Thr Cys Gly Glu Ile Cys --- Tyr Ala Ala Cys --- Gly Cys (SEQ ID NO: 136)
--- --- Thr Cys Gly Glu Ile Cys --- Tyr Ala Ala Cys Thr --- Cys (SEQ ID NO: 137)
--- --- Thr Cys Gly Glu Ile Cys Ala --- Ala Ala Cys Thr Gly Cys (SEQ ID NO: 138)
--- --- Thr Cys Gly Glu Ile Cys Ala --- --- Ala Cys Thr Gly Cys (SEQ ID NO: 139)

(57) Abstract: Compositions and related methods for treating IBS and other gastrointestinal disorders and conditions (e.g., gastrointestinal motility disorders, functional gastrointestinal disorders, gastroesophageal reflux disease (GERD), duodenogastric reflux, Crohn's disease, ulcerative colitis, inflammatory bowel disease, functional heartburn, dyspepsia (including functional dyspepsia or nonulcer dyspepsia), gastroparesis, chronic intestinal pseudo-obstruction (or colonic pseudoobstruction), and disorders and conditions associated with constipation, e.g., constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described. The compositions feature peptides that activate the guanylate cyclase C (GC-C) receptor.

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METHODS AND COMPOSITIONS FOR THE TREATMENT OF GASTROINTESTINAL DISORDERS

This application is a continuation in part of U.S. Utility Patent Application Serial No. 11/054,072, filed February 8, 2005, the entire contents of which are hereby incorporated by reference.

TECHNICAL FIELD

This invention relates to methods and compositions for treating gastrointestinal disorders, obesity, congestive heart failure, benign prostatic hyperplasia (BPH) and other disorders.

BACKGROUND

Irritable bowel syndrome (IBS) is a common chronic disorder of the intestine that affects 20 to 60 million individuals in the US alone (Lehman Brothers, Global Healthcare-Irritable Bowel Syndrome Industry Update, September 1999). IBS is the most common disorder diagnosed by gastroenterologists (28% of patients examined) and accounts for 12% of visits to primary care physicians (Camilleri 2001 *Gastroenterology* 120:652-668). In the US, the economic impact of IBS is estimated at $25 billion annually, through direct costs of health care use and indirect costs of absenteeism from work (Talley 1995 Gastroenterology 109:1736-1741). Patients with IBS have three times more absenteeism from work and report a reduced quality of life. Sufferers may be unable or unwilling to attend social events, maintain employment, or travel even short distances (Drossman 1993 *Dig Dis Sci* 38:1569-1580). There is a tremendous unmet medical need in this population since few prescription options exist to treat IBS.

Patients with IBS suffer from abdominal pain and a disturbed bowel pattern. Three subgroups of IBS patients have been defined based on the predominant bowel habit: constipation-predominant (c-IBS), diarrhea-predominant (d-IBS) or alternating between the two (a-IBS). Estimates of

individuals who suffer from c-IBS range from 20-50% of the IBS patients with 30% frequently cited. In contrast to the other two subgroups that have a similar gender ratio, c-IBS is more common in women (ratio of 3:1) (Talley et al. 1995 *Am J Epidemiol* 142:76-83).

The definition and diagnostic criteria for IBS have been formalized in the "Rome Criteria" (Drossman et al. 1999, Gut 45:Suppl II: 1-81), which are well accepted in clinical practice. Briefly, the criteria specify that for at least 12 weeks (consecutive or non-consecutive in the preceding 12 months of abdominal discomfort or pain at least two of the following three features must occur: (1) relieved with defecation, (2) onset associated with a change in frequency of stool, and (3) onset associated with a change in form (appearance) of stool. The Rome II criteria also state that the symptoms that cumulatively support the diagnosis of irritable bowel syndrome include: abnormal stool frequency ("abnormal" may be defined as greater than 3 bowel movements per day and less than 3 bowel movements per week), abnormal stool form (lumpy/hard or loose/watery stool), abnormal stool passage (straining, urgency, or feeling of incomplete evacuation), passage of mucus, and bloating or feeling of abdominal distension. However, the complexity of symptoms has not been explained by anatomical abnormalities or metabolic changes. This has led to the classification of IBS as a functional GI disorder, which is diagnosed on the basis of the Rome criteria and limited evaluation to exclude organic disease (Ringel et al. 2001, Annu Rev Med 52: 319-338). IBS is considered to be a "biopsychosocial" disorder resulting from a combination of three interacting mechanisms: altered bowel motility, an increased sensitivity of the intestine or colon to pain stimuli (visceral sensitivity) and psychosocial factors (Camilleri 2001, Gastroenterology 120:652-668). Recently, there has been increasing evidence for a role of inflammation in etiology of IBS. Reports indicate that subsets of IBS patients have small but significant increases in colonic inflammatory and mast cells, increased inducible nitric oxide (NO) and synthase (iNOS) and altered expression of inflammatory cytokines (reviewed by Talley 2000, Medscape Coverage of DDW week).

The present invention features peptides that activate and/or bind the guanylate cyclase-C (GC-C) receptor (reviewed by Lucas et al. 2000 Pharmacol. Rev 52:375-414 and Vaandrager et al. 2002 Molecular and Cellular Biochemistry 230:73-83) and any of its variants, including but not

limited to insertion, deletion, mutation, and splice variants. GC-C is a key regulator in mammals of intestinal function (although low levels of GC-C have been detected in other tissues). GC-C responds to the endogenous hormones, guanylin and uroguanylin, and to enteric bacterial peptides from the heat stable enterotoxin family (ST peptides). When agonists bind to GC-C, there is an elevation of the second messenger, cyclic GMP, and an increase in chloride and bicarbonate secretion, resulting in an increase in intestinal fluid secretion. The Genbank protein GI accession number for guanylyl cyclase C homologs from multiple organisms are:

Genbank GI number	organism
27806993	cattle
16555439	eel
16555437	eel
4521169	fish
1850774	frog
1495352	Guinea pig
2494861	Guinea pig
4826752	human
4505441	human
1184046	human
1230617	mouse
2708786	mouse
71894985	mouse
47523018	pig
5930067	rabbit
6981000	rat
40445437	worm

Particularly useful peptides bind to and/or activate the human GC-C receptor in the assay described below using the T84 human colon carcinoma cell line.

SUMMARY OF THE INVENTION

The present invention features compositions and related methods for treating IBS and other gastrointestinal disorders and conditions (e.g., gastrointestinal motility disorders, inflammatory bowel disease (IBD), chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein.

The present invention also features compositions and related methods for treating obesity, congestive heart failure and benign prostatic hyperplasia (BPH).

Without being bound by any particular theory, in the case of IBS and other gastrointestinal disorders the peptides are useful because they can increase gastrointestinal motility.

Without being bound by any particular theory, in the case of IBS and other gastrointestinal disorders the peptides are useful, in part, because they can decrease inflammation.

Without being bound by any particular theory, in the case of IBS and other gastrointestinal disorders the peptides are also useful because they may decrease gastrointestinal pain, visceral pain, chronic visceral hypersensitivity, or hypersensitivity to colorectal distension.

The invention features pharmaceutical compositions comprising certain peptides that are capable of activating the guanylate-cyclase C (GC-C) receptor. Also within the invention are pharmaceutical compositions comprising a peptide or GC-C agonist of the invention as well as

combination compositions comprising a peptide of the invention and one or more additional therapeutic agents including, without limitation, the agents described herein. The other agents can be administered with the peptides of the invention (simultaneously or sequentially). They can also be linked to a peptide of the invention to create therapeutic conjugates.

The invention includes methods for treating various gastrointestinal disorders by administering a peptide that acts as a partial or complete agonist of the GC-C receptor. Unless otherwise specified, the term "agonist" used herein refers to an agonist of the GC-C receptor. The peptide contains up to four cysteines that form one or two disulfide bonds. In certain embodiments the disulfide bonds are replaced by other covalent cross-links and in some cases the cysteines are substituted by other residues to provide for alternative covalent cross-links. The peptides may also include at least one trypsin or chymotrypsin cleavage site and/or a carboxy-terminal analgesic peptide or small molecule, e.g., AspPhe or some other analgesic peptide. When present within the peptide, the analgesic peptide or small molecule may be preceded by a chymotrypsin or trypsin cleavage site that allows release of the analgesic peptide or small molecule. The peptides and methods of the invention are also useful for treating pain and inflammation associated with various disorders, including gastrointestinal disorders. Certain peptides include a functional chymotrypsin or trypsin cleavage site located so as to allow inactivation of the peptide upon cleavage. Certain peptides having a functional cleavage site undergo cleavage and gradual inactivation in the digestive tract, and this is desirable in some circumstances. In certain peptides, a functional chymotrypsin site is altered, increasing the stability of the peptide *in vivo* (e.g., guanylin).

The invention includes: a method for increasing intestinal motility comprising administering a GC-C receptor agonist, e.g., a peptide described herein, to a patient in need thereof.

The invention includes a method for treating a disorder associated with reduced gastrointestinal transit rates or reduced gastrointestinal motility comprising administering a GC-C receptor agonist, e.g., a peptide described herein, to a patient in need thereof

The invention also includes a method for treating a gastrointestinal hypomotility disorder comprising administering a GC-C receptor agonist, e.g., a peptide described herein, to a patient in need thereof.

The disorders which can be treated by administering a GC-C receptor agonist, e.g., a peptide described herein, include constipation, constipation dominant irritable bowel syndrome and pelvic floor dyssynergia.

The invention features a method treating a non-inflammatory gastrointestinal disorder comprising administering a GC-C receptor agonist, e.g., a peptide described herein, to a patient in need thereof.

The invention includes a method treating a gastrointestinal disorder other than Crohn's disease and ulcerative colitis comprising administering a GC-C receptor agonist, e.g., a peptide described herein, to a patient in need thereof.

The invention includes methods for treating other disorders such as congestive heart failure and benign prostatic hyperplasia by administering a peptide or small molecule (parenterally or orally) that acts as an agonist of the GC-C receptor. Such agents can be used in combination with natriuretic peptides (e.g., atrial natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide), a diuretic, or an inhibitor of angiotensin converting enzyme.

The invention features methods and compositions for increasing intestinal motility. Intestinal motility involves spontaneous coordinated distentions and contractions of the stomach, intestines, colon and rectum to move food through the gastrointestinal tract during the digestive process.

In certain embodiments the patient has been diagnosed as suffering from IBS according to the Rome criteria. In certain embodiments the patient is female.

The peptide can contain additional carboxy terminal or amino terminal amino acids or both. For example, the peptide can include an amino terminal sequence that facilitates recombinant production of the peptide and is cleaved prior to administration of the peptide to a patient. The peptide can also include other amino terminal or carboxy terminal amino acids. In some cases the additional amino acids protect the peptide, stabilize the peptide or alter the activity of the peptide. In some cases some or all of these additional amino acids are removed prior to administration of the peptide to a patient. The peptide can include 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 40, 50, 60, 70 80, 90, 100 or more amino acids at its amino terminus or carboxy terminus or both. The number of flanking amino acids need not be the same. For example, there can be 10 additional amino acids at the amino terminus of the peptide and none at the carboxy terminus.

In certain embodiments the peptides include either one or two or more contiguous negatively charged amino acids (e.g., Asp or Glu) or one or two or more contiguous positively charged residues (e.g., Lys or Arg) or one or two or more contiguous positively or negatively charged amino acids at the carboxy terminus. In these embodiments all of the flanking amino acids at the carboxy terminus are either positively or negatively charged. In other embodiments the carboxy terminal charged amino acids are preceded by a Leu. For example, the following amino acid sequences can be added to the carboxy terminus of the peptide: Asp; Asp Lys; Lys Lys Lys Lys Lys Lys; Asp Lys Lys Lys Lys Lys Lys; Leu Lys Lys; and Leu Asp. It is also possible to simply add Leu at the carboxy terminus.

In a first aspect, the invention features a polypeptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein:

Xaa_1 is Ser, Asn, Tyr, Ala, Gln, Pro, Lys, Gly, or Thr, or is missing;

Xaa_2 is His, Asp, Glu, Ala, Ser, Asn, Gly, or is missing;

Xaa_3 is Thr, Asp, Ser, Glu, Pro, Val or Leu;

Xaa_5 is Asp, Ile or Glu;

Xaa_6 is Ile, Trp or Leu;

Xaa_7 is Cys, Ser, or Tyr;

Xaa_8 is Ala, Val, Thr, Ile, Met or is missing;

Xaa_9 is a) any amino acid, b) Phe, Tyr, Asn, Trp, c) an amino acid other than Phe, Trp, or Tyr, d) non-aromatic amino acid or e) is missing;

Xaa_{10} is Ala, Val, Met, Thr or Ile;

Xaa_{11} is Ala or Val;

Xaa_{13} is Ala or Thr;

Xaa_{14} is Gly, Ala or Ser;

Xaa_{15} is Cys, Tyr or is missing; and

Xaa_{16} is: a) Trp, Tyr or Phe to create a chymotrypsin cleavage site; b) Lys or Arg to create a trypsin cleavage site; c) is missing or d) His or Leu or Ser.

In some embodiments, Xaa_1 is preceded by Lys or Tyr.

In certain embodiments, a Cys is replaced by any amino acid other than Cys. Certain such polypeptides will have fewer disulfide bonds.

In a related aspect the invention features a composition comprising a polypeptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein: Xaa_1 is Ser, Asn, Tyr, Ala, Gln, Pro, Lys, Gly, or Thr, or is missing; Xaa_2 is His, Asp, Glu, Ala, Ser, Asn, Gly, Pro or is missing; Xaa_3 is Thr, Asp, Ser, Glu, Pro, Val or Leu; Xaa_5 is Asp, Ile or Glu; Xaa_6 is Ile, Trp or Leu; Xaa_7 is Cys, Ser, or Tyr; Xaa_8 is Ala, Val, Thr, Ile, Met or is missing; Xaa_9 is Phe, Tyr, Asn, Trp, an amino acid other than Phe, Trp, or Tyr, is a non-aromatic amino acid or is missing; Xaa_{10} is Ala, Val, Met, Thr or Ile; Xaa_{11} is Ala or Val; Xaa_{13} is Ala or Thr; Xaa_{14} is Gly, Ala or Ser; Xaa_{15} is Cys, Tyr or is missing; and Xaa_{16} is: a) Trp, Tyr or Phe to create a chymotrypsin cleavage site; b) Lys or Arg to create a trypsin cleavage site; c) is missing or d) His or Leu or Ser and a pharmaceutically acceptable carrier. In related aspects, the invention features a pharmaceutically acceptable tablet, pill, capsule comprising the peptide.

In a related aspect, the invention features a polypeptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein:

Xaa_1 is Asn, any amino acid or is missing;

Xaa_2 is Asp, Glu, any amino acid or is missing;

Xaa_3 is Asp or Glu;

Xaa_5 is any amino acid or Glu;

Xaa_6 is any amino acid or Leu;

Xaa_7 is Cys;

Xaa_8 is any amino acid or Val;

Xaa_9 is Asn, Gln, Tyr;

Xaa_{10} is is any amino acid or Val;

Xaa_{11} is any amino acid or Ala;

Xaa_{13} is is any amino acid or Thr;

Xaa_{14} is is any amino acid or Gly;

Xaa_{15} is Cys;

Xaa_{16} is any amino acid, Leu or missing

In a related aspect, the invention features a polypeptide comprising, consisting of, or consisting essentially of the amino acid sequence: Asn_1 Xaa_2 Xaa_3 Xaa_4 Glu_5 Leu_6 Xaa_7 Val_8 Asn_9 Xaa_{10} Xaa_{11} Xaa_{12} Thr_{13} Xaa_{14} Xaa_{15} Leu_{16} (SEQ ID NO:__)

Xaa_2 is Asp or Glu;

Xaa_3 is Asp or Glu;

Xaa_4 is Cys or Mpt (mercaptoproline) or Pen (penicillamine) or Dpr (diaminopropionic acid) or Asp or Glu;

Xaa_7 is Cys or Mpt (mercaptoproline) or Pen (penicillamine) or Dpr (diaminopropionic acid) or Asp or Glu;

Xaa_{10} is Val or Pro;

Xaa_{11} is Ala or Aib (alpha-aminoisobutyric acid);

Xaa_{12} is Cys or Mpt (mercaptoproline) or Pen (penicillamine) or Dpr (diaminopropionic acid) or Asp or Glu;

Xaa_{14} is Gly or Ala;

Xaa_{15} is Cys or Mpt (mercaptoproline) or Pen (penicillamine) or Dpr (diaminopropionic acid) or Asp or Glu; and

In certain embodiments, where Xaa_{15} is other than Cys or is missing, Xaa_7 is Ser or an amino acid other than Cys.

In certain embodiments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 or 12 of Xaa_1, Xaa_2, Xaa_3, Xaa_5, Xaa_6, Xaa_7, Xaa_8, Xaa_9, Xaa_{10}, Xaa_{11}, Xaa_{13}, Xaa_{14}, and Xaa_{16} are any amino acid other than Cys.

In certain embodiments, Xaa_9 is any amino acid other than Gln. In other embodiments where Xaa_2 and Xaa_3 are Glu, Xaa_9 is any amino acid other than Gln.

In certain embodiments Xaa_1 and Xaa_2 are missing; Xaa_3 is Thr; Xaa_5 is Glu; Xaa_6 is Ile or Leu; Xaa_8 is Ala, Val, or Ile; Xaa_9 is Phe or Tyr; Xaa_{10} is Ala or Val; Xaa_{11} is Ala; Xaa_{13} is Ala or Thr; Xaa_{14} is Gly; and Xaa_{16} is Trp, Tyr, Phe, Lys, Arg or is missing.

In certain embodiments the polypeptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) is not cleaved after Xaa_9 by chymotrypsin. In these embodiments wherein:

Xaa_1 is Ser, Asn, Tyr, Ala, Gln, Pro, Lys, Gly, or Thr, or is missing;

Xaa_2 is His, Asp, Glu, Ala, Ser, Asn, or Gly, or is missing;

Xaa_3 is Thr, Asp, Ser, Glu, Pro, Val or Leu or is missing;

Xaa_5 is Asp, Ile or Glu;

Xaa_6 is Ile, Trp or Leu;

Xaa_7 is Cys, Ser, or Tyr;

Xaa_8 is Ala, Val, Thr, Ile, Met or is missing;

Xaa_9 is either: a) any amino acid other than Phe and Tyr, b) any amino acid other than Phe, Tyr, and Trp, c) any amino acid other than Phe, Tyr, Trp, Ile, Leu and Val; d) any amino acid other than Phe, Tyr, Trp, Ile, Leu, Val, and His; d) any non-aromatic amino acid or e) is missing;

Xaa_{10} is Ala, Val, Met, Thr or Ile;

Xaa_{11} is Ala or Val;

Xaa_{13} is Ala or Thr;

Xaa_{14} is Gly, Ala or Ser;

Xaa_{15} is Cys, Tyr or is missing; and

Xaa_{16} is: a) Trp, Tyr or Phe to create a chymotrypsin cleavage site; b) Lys or Arg to create a trypsin cleavage site; c) is missing or d) His or Leu or Ser.

In addition, the invention features variants of Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) that is not cleaved after Xaa_9 by chymotrypsin due to the addition of an amino terminal lysine. An example of such a molecule is a human guanylin variant having an amino terminal lysine: KPGTCEICAYAACTGC (SEQ ID NO:).

In certain embodiments of the peptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) that is not cleaved after Xaa_9 by chymotrypsin, Xaa_7 and Xaa_{15} are both Cys.

Also within the invention are variants of PGTCEICAYAACTGC (human guanylin) (SEQ ID NO:) wherein Y is substituted by any amino acid other than a) Phe; b) any amino acid other than Phe and Trp; c) any amino acid other than Phe, Trp, Ile, Leu and Val; d) any amino acid other than Phe, Trp, Ile, Leu, Val and His; e) any non-aromatic amino acid or f) is missing.

In certain embodiments the polypeptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13}

Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) is not cleaved after Xaa_9 by either chymotrypsin or trypsin. In these embodiments wherein:

Xaa_1 is Ser, Asn, Tyr, Ala, Gln, Pro, Lys, Gly, or Thr, or is missing;

Xaa_2 is His, Asp, Glu, Ala, Ser, Asn, or Gly, or is missing;

Xaa_3 is Thr, Asp, Ser, Glu, Pro, Val or Leu or is missing;

Xaa_5 is Asp, Ile or Glu;

Xaa_6 is Ile, Trp or Leu;

Xaa_7 is Cys, Ser, or Tyr;

Xaa_8 is Ala, Val, Thr, Ile, Met or is missing;

Xaa_9 is either: a) any amino acid other than Lys, Arg, Phe and Tyr, b) any amino acid other than Lys, Arg, Phe, Tyr, and Trp, c) any amino acid other than Lys, Arg, Phe, Tyr, Trp, Ile, Leu and Val; d) any amino acid other than Lys, Arg, Phe, Tyr, Trp, Ile, Leu, Val, and His; or e) is missing;

Xaa_{10} is Ala, Val, Met, Thr or Ile;

Xaa_{11} is Ala or Val;

Xaa_{13} is Ala or Thr;

Xaa_{14} is Gly, Ala or Ser;

Xaa_{15} is Cys, Tyr or is missing; and

Xaa_{16} is: a) Trp, Tyr or Phe to create a chymotrypsin cleavage site; b) Lys or Arg to create a trypsin cleavage site; c) is missing or d) His or Leu or Ser.

In certain embodiments of the peptide comprising, consisting of, or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) that is not cleaved after Xaa_9 by chymotrypsin or trypsin, Xaa_7 and Xaa_{15} are both Cys.

Useful variants of PGTCEICAYAACTGC (human guanylin) (SEQ ID NO:) that should not be cleaved by chymotrypsin include:
PGTCEICASAACTGC (SEQ ID NO:)
PGTCEICATAACTGC (SEQ ID NO:)

PGTCEICANAACTGC (SEQ ID NO:)
PGTCEICAQAACTGC (SEQ ID NO:)
PGTCEICARAACTGC (SEQ ID NO:)
PGTCEICAEAACTGC (SEQ ID NO:)
PGTCEICADAACTGC (SEQ ID NO:)
PGTCEICAGAACTGC (SEQ ID NO:)
PGTCEICAAAACTGC (SEQ ID NO:)
PGTCEICAMAACTGC (SEQ ID NO:).

Additional variants which are not likely to be cleaved by chymotrypsin under certain conditions include:
PGTCEICAIAACTGC (SEQ ID NO:)
PGTCEICALAACTGC (SEQ ID NO:)
PGTCEICAVAACTGC (SEQ ID NO:)
PGTCEICAHAACTGC (SEQ ID NO:)

The invention also features deletion variants of any of the peptides described herein in which one, two, three or four amino acids, other than a Cys, are deleted. Where two (or more) amino acids are deleted and the peptide comprises the sequence: Cys_a Xaa Xaa Cys_b Xaa Xaa Xaa Xaa Cys_c Xaa Xaa Cys_d, in some embodiments two or more deletions can be located between Cys_a and Cys_b or between Cys_b and Cys_c or between Cys_c and Cys_d. Thus, there can be two or more deletions between two Cys. However, in other embodiments there is at most one deletion between each Cys, i.e., there is no more than one deletion between each of Cys_a and Cys_b, Cys_b and Cys_c, and Cys_c and Cys_d. Thus, the invention includes any of the peptides described herein comprising the sequence Cys_a Xaa Xaa Cys_b Xaa Xaa Xaa Xaa Cys_c Xaa Xaa Cys_d wherein: a) one amino acid between Cys_a and Cys_b is deleted; b) one amino acid between Cys_b and Cys_c is deleted; c) one amino acid between Cys_c and Cys_d is deleted; d) one amino acid between Cys_a and Cys_b is deleted and one amino acid between Cys_b and Cys_c is deleted; e) one amino acid between Cys_a and Cys_b is deleted and one amino acid between Cys_c and Cys_d is deleted; f) one amino acid between Cys_b and Cys_c is deleted and one amino acid between Cys_c and Cys_d is

deleted; or g) one amino acid between Cys_a and Cys_b is deleted, one amino acid between Cys_b and Cys_c is deleted, and one amino acid between Cys_c and Cys_d is deleted. In addition, one or more amino acids preceding Cys_a and/or one or more amino acids following Cys_d can be deleted. In certain embodiments, the deletion variants are peptides that bind to and/or activate the GC-C receptor. In certain embodiments, the deletion variants increase cGMP levels.

The invention also features deletion variants of any of the peptides described herein in which one, two, three or four amino acids (or non-natural amino acids or natural or non-natural amino acid analogs), other than a Cys (or an amino acid substituted for Cys, e.g., an amino acid capable of forming a covalent bond to another amino acid) is deleted. Thus, additional variants include those in which a Cys is substituted by an amino acid capable of forming a covalent linkage with another amino acid (e.g., a Cys or a substitute therefore). Such amino acids include: Mpt (mercaptoproline) or Pen (penicillamine) or Dpr (diaminopropionic acid).

FIG. 1 includes deletion variants of human guanylin in which one, two, three or four amino acids are deleted. The deleted amino acids are between Cys_a and Cys_d as well as amino terminal to Cys_a.

The invention also features insertion variants of any of the peptides described herein in which one, two, three or four amino acids are inserted.

Where two (or more) amino acids are inserted and the peptide comprises the sequence: Cys_a Xaa Xaa Cys_b Xaa Xaa Xaa Xaa Cys_c Xaa Xaa Cys_d, in some embodiments two or more insertions can be located between Cys_a and Cys_b or between Cys_b and Cys_c or between Cys_c and Cys_d. However, in other embodiments there is at most one insertion between each of Cys_a and Cys_b or between Cys_b and Cys_c or between Cys_c and Cys_d. Thus, the invention includes any of the peptides described herein comprising the sequence Cys_a Xaa Xaa Cys_b Xaa Xaa Xaa Xaa Cys_c Xaa Xaa Cys_d wherein: a) one amino acid is inserted between Cys_a and Cys_b; b) one amino acid is inserted between Cys_b and Cys_c; c) one amino acid is inserted between Cys_c and Cys_d; d) one amino acid is inserted between Cys_a and Cys_b and one amino acid is inserted between Cys_b and

Cys_c; e) one amino acid is inserted between Cys_a and Cys_b and one amino acid is inserted between Cys_c and Cys_d; f) one amino acid is inserted between Cys_b and Cys_c and one amino acid is inserted between Cys_c and Cys_d or g) one amino acid is inserted between Cys_a and Cys_b, one amino acid is inserted between Cys_b and Cys_c, and one amino acid is inserted between Cys_c and Cys_d. In addition, one or more amino acids can be inserted preceding Cys_a and/or one or more amino acids can be inserted following Cys_d. The insertions can be any natural or non-natural occurring amino acid (e.g., Gly or Ala) or amino acid analog and where there are more than one insertions present, they can be the same or different. In certain embodiments, the insertion variants are peptides that bind to and/or activate the GC-C receptor. In certain embodiments, the insertion variants are peptides that increase cGMP levels.

For example, the invention includes the following variants of PGTCGEICAYAACTGC (human guanylin) (SEQ ID NO:)

PGTCEGICAYAACTGC (SEQ ID NO:)
PGTCEIGCAYAACTGC (SEQ ID NO:)
PGTCEICGAYAACTGC (SEQ ID NO:)
PGTCEICAGYAACTGC (SEQ ID NO:)
PGTCEICAYGAACTGC (SEQ ID NO:)
PGTCEICAYAGACTGC (SEQ ID NO:)
PGTCEICAYAAGCTGC (SEQ ID NO:)
PGTCEICAYAACGTGC (SEQ ID NO:)
PGTCEICAYAACTGGC (SEQ ID NO:)
PGTCAEICAYAACTGC (SEQ ID NO:)
PGTCEAICAYAACTGC (SEQ ID NO:)
PGTCEIACAYAACTGC (SEQ ID NO:)
PGTCEICAAYAACTGC (SEQ ID NO:)
PGTCEICAYAAACTGC (SEQ ID NO:)
PGTCEICAYAACATGC (SEQ ID NO:)
PGTCEICAYAACTAGC (SEQ ID NO:)

PGTCEICAYAACTGAC (SEQ ID NO:)
PGTCAEICAAYAACTGC (SEQ ID NO:)
PGTCEAICAAYAACTGC (SEQ ID NO:)
PGTCEIACAAYAACTGC (SEQ ID NO:)

Other insertion variants of human guanylin can have up to four amino acids (i.e., 0, 1, 2, 3 or 4 natural or non-natural amino acids) inserted after each of the 15 amino acids in human guanylin. Thus, the invention includes peptides having the sequence: Pro $Xaa_{(0-4)}$ Gly $Xaa_{(0-4)}$ Thr $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Glu $Xaa_{(0-4)}$ Ile $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Ala $Xaa_{(0-4)}$ Tyr $Xaa_{(0-4)}$ Ala $Xaa_{(0-4)}$ Ala $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ Thr $Xaa_{(0-4)}$ Gly $Xaa_{(0-4)}$ Cys $Xaa_{(0-4)}$ (SEQ ID NO:). The inserted amino acids can be any amino acid and can be the same or different. In certain embodiments the inserted amino acids are all Gly or all Ala or a combination of Gly and Ala.

FIG. 2 depicts insertion variants of human guanylin in which one, two, three or four amino acids are inserted. The inserted amino acids are between Cys_a and Cys_d as well as amino terminal to Cys_a and carboxy terminal to Cys_d.

The invention also features variants of peptides having the sequence Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1), e.g., variants of PGTCEICAYAACTGC human guanylin (SEQ ID NO:) in which up to four amino acids are deleted and/or up to four amino acids are inserted. The insertions and deletions can be between Cys4 and Cys12 in SEQ ID NO:1 or they can be amino terminal to Cys4 and/or carboxy terminal to Cys12 in SEQ ID NO:1

When Xaa_{16} is Trp, Tyr or Phe, the peptide has a chymotrypsin cleavage site that is located at a position where cleavage will liberate the portion of the peptide carboxy-terminal to Xaa_{16}. When Xaa_{16} is Lys or Arg, the peptide has a trypsin cleavage site that is located at a position where cleavage will liberate portion of the peptide carboxy-terminal to Xaa_{16}. Thus, if the peptide includes an analgesic peptide carboxy-terminal to Xaa_{16}, the peptide will be liberated in the digestive tract upon exposure to the appropriate protease. Among the analgesic peptides which

can be included in the peptide are: AspPhe, endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, and ziconotide, substance P and other analgesic peptides described herein.

When Xaa_1 or the amino-terminal amino acid of the peptide of the invention (e.g., Xaa_2 or Xaa_3) is Trp, Tyr or Phe, the peptide has a chymotrypsin cleavage site that is located at a position where cleavage will liberate the portion of the peptide amino-terminal to Xaa_1 (or Xaa_2 or Xaa_3) along with Xaa_1, Xaa_2 or Xaa_3. When Xaa_1 or the amino-terminal amino acid of the peptide of the invention (e.g., Xaa_2 or Xaa_3) is Lys or Arg, the peptide has a trypsin cleavage site that is located at a position where cleavage will liberate portion of the peptide amino-terminal to Xaa_1 along with Xaa_1, Xaa_2 or Xaa_3). Thus, for example, if the peptide includes an analgesic peptide amino-terminal to Xaa_1, the peptide will be liberated in the digestive tract upon exposure to the appropriate protease. Among the analgesic peptides which can be included in the peptide are: AspPhe, endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, ziconotide, and substance p and other analgesic peptides described herein.

The peptides can be co-administered with or linked, e.g., covalently linked to any of a variety of other peptides or compounds including analgesic peptides or analgesic compounds including, without limitation, the agents described herein

Amino acid, non-amino acid, peptide and non-peptide spacers can be interposed between a peptide that is a GC-C receptor agonist and a peptide that has some other biological function, e.g., an analgesic peptide or a peptide used to treat obesity. The linker can be one that is cleaved from the flanking peptides in vivo or one that remains linked to the flanking peptides in vivo. For example, glycine, beta-alanine, glycyl-glycine, glycyl-beta-alanine, gamma-aminobutyric acid, 6-aminocaproic acid, L-phenylalanine, L-tryptophan and glycil-L-valil-L-phenylalanine can be used as spacers (Chaltin et al. 2003 Helvetica Chimica Acta 86:533-547; Caliceti et al. 1993 FARMCO 48:919-32) as can polyethylene glycols (Butterworth et al. 1987 J. Med. Chem 30:1295-302) and maleimide derivatives (King et al. 2002 Tetrahedron Lett. 43:1987-1990). Various other linkers are described in the literature (Nestler 1996 Molecular Diversity 2:35-42; Finn et al. 1984 Biochemistry 23:2554-8; Cook et al. 1994 Tetrahedron Lett. 35:6777-80; Brokx

et al. 2002 Journal of Controlled Release 78:115-123; Griffin et al. 2003 J. Am. Chem. Soc. 125:6517-6531; Robinson et al. 1998 Proc. Natl. Acad. Sci. USA 95:5929-5934). Linkers are also described in US20050171014, for example, amino acid linkers such as FALA, VLALA, ALAL, ALALA, 2-cyclohexyl-L-alanine-LALA, 2-cyclohexyl-L-alanine-2-cyclohexyl-L-alanine-LAL, 1-naphtyl-alanine-ChaLAL and 1-naphtyl-alanine-LALA. Peptides and agonists of the invention can also be conjugated to: an affinity tag (such as (histidine 6) H6), a HIV tat peptide residues 49-57, HIV tat peptide residues 49-56, the tat sequence YGRKKRRQRRR, a polyarginine peptide having from 6 to 20 residues (such as R6) and the following peptide sequences: YARKARRQARR, YARAAARQARA, YARAARRAARR, YARAARRAARA, ARRRRRRRRR, and YAAARRRRRRR, which are disclosed in WO 99/29721 and in US patent No. 6,221,355 (SEQ. ID. NOs. 3-8).

The peptides of the invention can be attached to one, two or more different moieties each providing the same or different functions. For example, the peptide can be linked to a molecule that is an analgesic and to a peptide that is used to treat obesity. The peptide and various moieties can be ordered in various ways. For example, a peptide of the invention can have an analgesic peptide linked to its amino terminus and an anti-obesity peptide linked to its carboxy terminus. The additional moieties can be directly covalently bonded to the peptide or can be bonded via linkers.

The peptides of the invention can be a cyclic peptide or a linear peptide. In addition, multiple copies of the same peptide can be incorporated into a single cyclic or linear peptide.

The peptides can include the amino acid sequence of a peptide that occurs naturally in a vertebrate (e.g., mammalian) species or in a bacterial species. In addition, the peptides can be partially or completely non-naturally occurring peptides. Also within the invention are peptidomimetics corresponding to the peptides of the invention.

When fully folded, disulfide bonds are present between the first and third cysteines and between the second and fourth cysteines, e.g., there is a disulfide bond between Cys_4 and Cys_{12} and a

disulfide bond between Xaa_7 and Xaa_{15} (when Xaa_7 is a Cys and Xaa_{15} is a Cys). In some embodiments, the peptide has only one disulfide bond, e.g., between the first and third cysteines (i.e., Cys_4 and Cys_{12}; corresponds to the first and second cysteines when Xaa_7 is other than Cys). In certain embodiments one or more Cys can be replaced by Mpt (mercaptoproline) or Pen (penicillamine) or Dpr (diaminopropionic acid) or some other amino acid that can covalently link to another amino acid (e.g., Cys, Mpt, Pen or Dpr). In other embodiments, the peptide is a reduced peptide having no disulfide bonds.

In some embodiments, one or both members of a pair of Cys residues which normally form a disulfide bond can be replaced by homocysteine, penicillamine, 3-mercaptoproline (Kolodziej et al. 1996 *Int J Pept Protein Res* 48:274); β, β- dimethylcysteine (Hunt et al. 1993 *Int J Pept Protein Res* 42:249) or diaminopropionic acid (Smith et al. 1978 *J Med Chem* 21:117) to form alternative internal cross-links at the positions of the normal disulfide bonds.

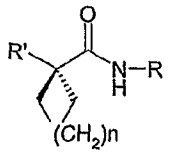
In addition, one or more disulfide bonds can be replaced by alternative covalent cross-links, e.g., an amide linkage ($-CH_2CH(O)NHCH_2-$ or $-CH_2NHCH(O)CH_2-$), an ester linkage, a thioester linkage, a lactam bridge, a carbamoyl linkage, a urea linkage, a thiourea linkage, a phosphonate ester linkage, an alkyl linkage ($-CH_2CH_2CH_2CH_2-$), an alkenyl linkage($-CH_2CH=CHCH_2-$), an ether linkage ($-CH_2CH_2OCH_2-$ or $-CH_2OCH_2CH_2-$), a thioether linkage ($-CH^2CH_2SCH_2-$ or $-CH_2SCH_2CH_2-$), an amine linkage ($-CH_2CH_2NHCH_2-$ or $-CH_2NHCH_2CH_2-$) or a thioamide linkage ($-CH_2CH(S)HNHCH_2-$ or $-CH_2NHCH(S)CH_2-$). For example, Ledu et al. (Proc Nat'l Acad. Sci. 100:11263-78, 2003) describe methods for preparing lactam and amide cross-links. Schafmeister et al. (J. Am. Chem. Soc. 122:5891, 2000) describe stable, hydrocarbon cross-links. Hydrocarbon cross links can be produced via metathesis (or methathesis followed by hydrogenation in the case of saturated hydrocarbons cross-links) using one or another of the Grubbs catalysts (available from Materia, Inc. and Sigma-Aldrich and described, for example, in U.S. Patent No. 5,831,108 and 6,111,121). In some cases, the generation of such alternative cross-links requires replacing the Cys residues with other residues such as Lys or Glu or non-naturally occurring amino acids. In addition the lactam, amide and hydrocarbon cross-links can be used to stabilize the peptide even if they link amino acids at positions other than those

occupied by Cys. Such cross-links can occur between two amino acids that are separated by two amino acids or between two amino acids that are separated by six amino acids (see, e.g., Schafmeister et al. (J. Am. Chem. Soc. 122:5891, 2000)).

In certain embodiments, one or more amino acids can be replaced by a non-naturally occurring amino acid or a naturally or non-naturally occurring amino acid analog. There are many amino acids beyond the standard 20 (Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val). Some are naturally-occurring others are not (see, for example, Hunt, The Non-Protein Amino Acids: In Chemistry and Biochemistry of the Amino Acids, Barrett, Chapman and Hall, 1985). For example, an aromatic amino acid can be replaced by 3,4-dihydroxy-L-phenylalanine, 3-iodo-L-tyrosine, triiodothyronine, L-thyroxine, phenylglycine (Phg) or nor-tyrosine (norTyr). Phg and norTyr and other amino acids including Phe and Tyr can be substituted by, e.g., a halogen, -CH3, -OH, $-CH_2NH_3$, -C(O)H, $-CH_2CH_3$, -CN, $-CH_2CH_2CH_3$, -SH, or another group. Any amino acid can be substituted by the D-form of the amino acid.

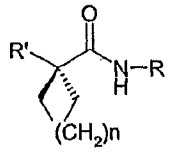
With regard to non-naturally occurring amino acids or a naturally and non-naturally occurring amino acid analogs, a number of substitutions in the peptide and agonists of the invention are possible alone or in combination.

For example, glutamine residues can be substituted with gamma-Hydroxy-Glu or gamma-Carboxy-Glu. Tyrosine residues can be substituted with an alpha substituted amino acid such as L-alpha-methylphenylalanine or by analogues such as: 3-Amino-Tyr; Tyr(CH3); $Tyr(PO_3(CH_3)_2)$; $Tyr(SO_3H)$; beta-Cyclohexyl-Ala; beta-(1-Cyclopentenyl)-Ala; beta-Cyclopentyl-Ala; beta-Cyclopropyl-Ala; beta-Quinolyl-Ala; beta-(2-Thiazolyl)-Ala; beta-(Triazole-1-yl)-Ala; beta-(2-Pyridyl)-Ala; beta-(3-Pyridyl)-Ala; Amino-Phe; Fluoro-Phe; Cyclohexyl-Gly; tBu-Gly; beta-(3-benzothienyl)-Ala; beta-(2-thienyl)-Ala; 5-Methyl-Trp; and 4-Methyl-Trp. Proline residues can be substituted with homopro (L-pipecolic acid); hydroxy-Pro; 3,4-Dehydro-Pro; 4-fluoro-Pro; or alpha-methyl-Pro or an N(alpha)-C(alpha) cyclized amino acid analogues with the structure:



n = 0, 1, 2, 3

Alanine residues can be substituted with alpha-substitued or N-methylated amino acid such as alpha-amino isobutyric acid (aib), L/D-alpha-ethylalanine (L/D-isovaline), L/D-methylvaline, or L/D-alpha-methylleucine or a non-natural amino acid such as beta-fluoro-Ala. Alanine can also substituted with:



n = 0, 1, 2, 3

Glycine residues can be substituted with alpha-amino isobutyric acid (aib) or L/D-alpha-ethylalanine (L/D-isovaline).

Further examples of unnatural amino acids include: an unnatural analogue of tyrosine; an unnatural analogue of glutamine; an unnatural analogue of phenylalanine; an unnatural analogue of serine; an unnatural analogue of threonine; an alkyl, aryl, acyl, azido, cyano, halo, hydrazine, hydrazide, hydroxyl, alkenyl, alkynl, ether, thiol, sulfonyl, seleno, ester, thioacid, borate, boronate, phospho, phosphono, phosphine, heterocyclic, enone, imine, aldehyde, hydroxylamine, keto, or amino substituted amino acid, or any combination thereof; an amino acid with a photoactivatable cross-linker; a spin-labeled amino acid; a fluorescent amino acid; an amino acid with a novel functional group; an amino acid that covalently or noncovalently interacts with another molecule; a metal binding amino acid; an amino acid that is amidated at a site that is not naturally amidated, a metal-containing amino acid; a radioactive amino acid; a photocaged and/or photoisomerizable amino acid; a biotin or biotin-analogue containing amino acid; a glycosylated or carbohydrate modified amino acid; a keto containing amino acid; amino acids comprising polyethylene glycol or polyether; a heavy atom substituted amino acid (e.g., an amino acid containing deuterium, tritium, ^{13}C, ^{15}N, or ^{18}O); a chemically cleavable or

photocleavable amino acid; an amino acid with an elongated side chain; an amino acid containing a toxic group; a sugar substituted amino acid, e.g., a sugar substituted serine or the like; a carbon-linked sugar-containing amino acid; a redox-active amino acid; an α.-hydroxy containing acid; an amino thio acid containing amino acid; an α, α disubstituted amino acid; a β-amino acid; a cyclic amino acid other than proline; an O-methyl-L-tyrosine; an L-3-(2-naphthyl)alanine; a 3-methyl-phenylalanine; a *p*-acetyl-L-phenylalanine; an 0-4-allyl-L-tyrosine; a 4-propyl-L-tyrosine; a tri-O-acetyl-GlcNAcβ-serine; an L-Dopa; a fluorinated phenylalanine; an isopropyl-L-phenylalanine; a p-azido-L-phenylalanine; a p-acyl-L-phenylalanine; a p-benzoyl-L-phenylalanine; an L-phosphoserine; a phosphonoserine; a phosphonotyrosine; a p-iodo-phenylalanine; a 4-fluorophenylglycine; a p-bromophenylalanine; a p-amino-L-phenylalanine; an isopropyl-L-phenylalanine; L-3-(2-naphthyl)alanine; an amino-, isopropyl-, or O-allyl-containing phenylalanine analogue; a dopa, O-methyl-L-tyrosine; a glycosylated amino acid; a p-(propargyloxy)phenylalanine; dimethyl-Lysine; hydroxy-proline; mercaptopropionic acid; methyl-lysine; 3-nitro-tyrosine; norleucine; pyro-glutamic acid; Z (Carbobenzoxyl); ε-Acetyl-Lysine; β-alanine; aminobenzoyl derivative; aminobutyric acid (Abu); citrulline; aminohexanoic acid; aminoisobutyric acid; cyclohexylalanine; d-cyclohexylalanine; hydroxyproline; nitro-arginine; nitro-phenylalanine; nitro-tyrosine; norvaline; octahydroindole carboxylate; ornithine; penicillamine; tetrahydroisoquinoline; acetamidomethyl protected amino acids and pegylated amino acids. Further examples of unnatural amino acids and amino acid analogs can be found in U.S. 20030108885, U.S. 20030082575, and the references cited therein.

In some embodiments, an amino acid can be replaced by a naturally-occurring, non-essential amino acid, e.g., taurine.

Methods to manufacture peptides containing unnatural amino acids can be found in, for example, U.S. 20030108885, U.S. 20030082575, Deiters et al., J Am Chem Soc. (2003) 125:11782-3, Chin et al., Science (2003) 301:964-7, and the references cited therein.

Peptides that include non-natural amino acids can also be prepared using the methods described in WO02086075.

The peptides of the invention can have one or more conventional peptide bonds replaced by an alternative bond. Such replacements can increase the stability of the peptide. For example, replacement of the peptide bond between a residue amino terminal to an aromatic residue (e.g. Tyr, Phe, Trp) with an alternative bond can reduce cleavage by carboxy peptidases and may increase half-life in the digestive tract. Bonds that can replace peptide bonds include: a retro-inverso bond (C(O)-NH instead of NH-C(O); a reduced amide bond (NH-CH2); a thiomethylene bond (S-CH_2 or CH_2-S); an oxomethylene bond (O-CH_2 or CH_2-O); an ethylene bond (CH_2-CH_2); a thioamide bond (C(S)-NH); a trans-olefine bond (CH=CH); a fluoro substituted trans-olefine bond (CF=CH); a ketomethylene bond (C(O)-CHR or CHR-C(O) wherein R is H or CH3; and a fluoro-ketomethylene bond (C(O)-CFR or CFR-C(O) wherein R is H or F or CH_3.

The peptides of the invention can be modified using standard modifications. Modifications may occur at the amino (N-), carboxy (C-) terminus, internally or a combination of any of the preceeding. In one aspect of the invention, there may be more than one type of modification on the peptide. Modifications include but are not limited to: acetylation, amidation, biotinylation, cinnamoylation, farnesylation, formylation, myristoylation, palmitoylation, phosphorylation (Ser, Tyr or Thr), stearoylation, succinylation, sulfurylation and cyclisation (via disulfide bridges or amide cyclisation), and modification by Cy3 or Cy5. The peptides of the invention may also be modified by 2, 4-dinitrophenyl (DNP), DNP-lysin, modification by 7-Amino-4-methyl-coumarin (AMC), flourescein, NBD (7-Nitrobenz-2-Oxa-1,3-Diazole), p-nitro-anilide, rhodamine B, EDANS (5-((2-aminoethyl)amino)naphthalene-1- sulfonic acid), dabcyl, dabsyl, dansyl, texas red, FMOC, and Tamra (Tetramethylrhodamine). The peptides of the invention may also be conjugated to, for example, polyethylene glycol (PEG); alkyl groups (e.g., C1-C20 straight or branched alkyl groups); fatty acid radicals; combinations of PEG, alkyl groups and fatty acid radicals (see U.S. Patent 6,309,633; Soltero et al., 2001 Innovations in Pharmaceutical Technology 106-110); BSA and KLH (Keyhole Limpet Hemocyanin).

The peptides of the invention bear some sequence similarity to uroguanylin, guanylin, lymphoguanylin and renoguanylin peptides. However, they may include amino acid changes

and/or additions that, in some instances, improve functionality. These changes can, for example, increase or decrease activity (e.g., increase or decrease the ability of the peptide to stimulate intestinal motility), alter the ability of the peptide to fold correctly, alter the stability of the peptide, alter the ability of the peptide to bind the GC-C receptor and/or decrease toxicity. In some cases the peptides may function more desirably than wild-type uroguanylin, guanylin, lymphoguanylin and renoguanylin peptides. For example, they may limit undesirable side effects such as diarrhea and dehydration.

The peptides and agonists of the invention can be chemically modified to increase therapeutic activity by synthetically adding sugar moieties (WO 88/02756; WO 89/09786; DE 3910667 A1, EP 0 374 089 A2; and U.S. 4,861,755), adding cationic anchors (EP0363589), lipid moieties (WO91/09837; U.S. 4,837,303) or the substituents described as compounds I, II, and III in US5552520.

The invention also features a purified polypeptide comprising, consisting of or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein:

Xaa_1 is any amino acid or is missing;

Xaa_2 is any amino acid or is missing;

Xaa_3 is any amino acid or is missing;

Xaa_5 is Glu;

Xaa_6 is Tyr, Trp, Phe or Leu;

Xaa_7 is Cys;

Xaa_8 is any of the 20 naturally-occurring amino acids other than Cys or is missing;

Xaa_9 is any of the 20 naturally-occurring amino acids;

Xaa_{10} is Pro or Gly;

Xaa_{11} is any of the 20 naturally-occurring amino acids;

Xaa_{13} is Thr, Val or Gly;

Xaa_{14} is Gly or Ala;

Xaa_{15} is Cys; and

Xaa_{16} is any of the 20 naturally-occurring amino acids or is missing.

In various embodiments: Xaa_9 is Asn; Xaa_{11} is Ala or Thr; Xaa_8 is missing; and Xaa_{16} is Tyr.

In other embodiments Xaa_4 is immediately preceded by an amino acid sequence seleted from: Ser His Thr; Pro Ser Thr; Thr; Pro Asp Pro; Ile Ala Glu Asp Ser His Thr; Ile Ala Gln Asp Pro Ser Thr; Ala Asn Thr; Asn Thr; Asp Pro Asn Thr; Lys Asn Thr; Pro Asn Thr; Ile Ala Gln Asp Pro Asn Thr; Lys Pro Asn Thr; Asp Pro Gly Thr; Glu Asp Pro Gly Thr; Pro Gly Thr; Pro Ala Thr; Val Ala Ala Arg Ala Asp Leu; Gly Asp Asp; Asn Asp Glu; Gln Glu Asp; Asn Asp Asp; Arg Thr Ile Ala Asn Asp Asp; Thr Ile Ala Asn Asp Asp; Asp Asp; Arg Thr Met Asp Asn Asp Glu; Arg Thr Ile Ala Gly Asp Asp; Arg Thr Ile Ala Asn Asp; Asp; Glu Asp; Arg Ser Ile Ser Gln Glu Asp; Thr Asp Glu; Arg Thr Ile Ala Thr Asp Glu; Glu; Ile Ile Thr Pro Pro Asp Pro; Gln Glu Leu; Lys Asp Asp; Gln Glu Glu; Arg Tyr Ile Asn Gln Glu Glu; Ala Ser Ser Tyr Ala Ser; and Thr Ser Ser Tyr Ala Ser.

The invention further features a purified polypeptide comprising, consisting of or consisting essentially the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein:

Xaa_1 is: a) Ser, Asn, Tyr, Ala, Gln, Pro, Lys, Gly, or Thr, or is missing; b) preceded by Lys or Tyr; c) any amino acid; d) missing; e) any amino acid other than Cys; or f) Lys or Arg;

Xaa_2 is: a) His, Asp, Glu, Ala, Ser, Asn, Gly, or is missing; b) His, Asp, Glu, Ala, Ser, Asn, Gly, Pro or is missing; c) Asp, Glu, any amino acid or is missing; d) Asp or Glu; e) any amino acid other than Cys; e) Glu; f) missing; g) Trp, Tyr or Phe; or h) Lys or Arg;

Xaa_3 is: a) Thr, Asp, Ser, Glu, Pro, Val or Leu; Asp or Glu; b) any amino acid other than Cys; c) Glu; d) Thr; e) Thr, Asp, Ser, Glu, Pro, Val or Leu or is missing; f) Trp, Tyr or Phe; or g) Lys or Arg;

Xaa_4 is: a) Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp, or Glu;

Xaa_5 is: a) any amino acid; b) Glu, Asp, Gln, Gly or Pro; c) Glu; d) Glu or Asp; e) Asp, Ile or Glu; f) any amino acid; or g) any amino acid other than Cys;

Xaa_6 is: a) Leu, Ile, Val, Ala, Lys, Arg, Trp, Tyr or Phe; b) Leu, Ile, Val, Lys, Arg, Trp, Tyr or Phe; Leu, Ile, Lys, Arg, Trp, Tyr or Phe; c) Leu, Ile, Val, Trp, Tyr or Phe; d) Trp, Tyr, Phe or Leu; e) Leu, Ile or Val; f) Ile, Trp or Leu; g) Trp, Tyr or Phe; h) Ile or Leu; i) Tyr; j) any amino acid; k) any amino acid except Leu; l) any natural or non-natural aromatic amino acid; or m) any amino acid other than Cys;

Xaa_7 is: a) Cys, Ser, or Tyr; Cys; b) Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp or Glu; c) Ser; or d) an amino acid other than Cys;

Xaa_8 is: a) Ala, Val, or Ile; b) Ala, Val, Thr, Ile, Met or is missing; c) any amino acid; d) Val; e) any amino acid other than Cys; or f) missing;

Xaa_9 is: a) any amino acid; b) any amino acid other than Phe and Tyr; c) any amino acid other than Phe, Tyr, and Trp; d) any amino acid other than Phe, Tyr, Trp, Ile, Leu and Val; e) any amino acid other than Phe, Tyr, Trp, Ile, Leu, Val, and His; f) any amino acid other than Gln; g) any amino acid other than Lys, Arg, Phe, Tyr, and Trp; h) any amino acid other than Lys, Arg, Phe, Tyr, Trp, Ile, Leu and Val; i) any amino acid other than Lys, Arg, Phe, Tyr, Trp, Ile, Leu, Val, and His; j) any non-aromatic amino acid; k) missing; l) Phe, Tyr, Asn, or Trp; m) Asn, Tyr, Asp or Ala; n) Asn, Gln, or Tyr; o) Phe or Tyr; p) Asn; or q) any amino acid other than Cys;

Xaa_{10} is: a) Ala, Pro or Gly; b) Pro or Gly; c) Pro; d) Ala, Val, Met, Thr or Ile; e) any amino acid; f) Val; g) Val or Pro; h) Ala or Val; i) any amino acid other than Cys; j) Pro; or k) Gly;

Xaa_{11} is: a) any amino acid; b) Ala, Leu, Ser, Gly, Val, Glu, Gln, Ile, Leu, Lys, Arg, or Asp; c) Ala or Gly; d) Ala; e) Ala or Val; f) any amino acid; g) Ala or Aib (alpha-aminoisobutyric acid); h) any amino acid other than Cys; i) Ala or Thr; or j) Thr.

Xaa_{12} is: a) Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp, or Glu; or b) any amino acid other than Cys;

Xaa_{13} is: a) Thr, Ala, Asn, Lys, Arg, or Trp; b) Thr, Ala, Lys, Arg, or Trp; c) any amino acid; d) any non-aromatic amino acid; e) Thr, Ala, or Trp; f) Trp, Tyr or Phe; g) Thr or Ala; h) any amino acid; i) Thr; j) any amino acid other than Cys; k) Thr, Val, or Gly; l) Thr or Val, m) Thr or Gly, n) Val or Thr; o) Val; p) Thr; or q) Gly;

Xaa_{14} is: a) Gly, Pro or Ala; b) Gly; c) any amino acid; d) Gly, Ala or Ser; e) Gly or Ala; f) any amino acid other than Cys; or g) Ala;

Xaa_{15} is: a) Cys, Tyr or is missing; b) Cys; c) Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp, Glu; or d) any amino acid other than Cys or is missing; and

Xaa_{16} is: a) Trp, Tyr, Phe, Asn, Ile, Val, His or Leu; b) Trp, Tyr, Phe, Asn or Leu; c) Trp, Tyr, Phe or Leu; d) Trp, Tyr, or Phe; e) Leu, Ile or Val; f) His, Leu or Ser; g) Tyr or Leu; Lys or Arg; h) His; i) any amino acid, j) Leu, or missing; k) Trp, Tyr, Phe, Lys, Arg or is missing; l) missing; m) any amino acid other than Cys; or n) Tyr.

Also featured is purified polypeptide comprising, consiting of or consisting essentially of the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Xaa_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Xaa_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein:

Xaa_1 is any amino acid or is missing;

Xaa_2 is any amino acid or is missing;

Xaa_3 is any amino acid or is missing;

Xaa_4 is Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp or Glu;

Xaa_5 is Glu;

Xaa_6 is Tyr, Trp, Phe or Leu;

Xaa_7 is Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp or Glu;

Xaa_8 is any amino acid other than Cys or is missing;

Xaa_9 is any amino acid;

Xaa_{10} is Pro or Gly;

Xaa_{11} is any amino acid;

Xaa_{12} is Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp or Glu;

Xaa_{13} is Thr, Val or Gly;

Xaa_{14} is Gly or Ala;

Xaa_{15} is Cys, Mpt (mercaptoproline), Pen (penicillamine), Dpr (diaminopropionic acid), Asp or Glu; and

Xaa_{16} is any amino acid or is missing.

The invention also features peptides which may include one or more of the peptide modifications, one or more non-natural amino acid or amino acid analogs, one or more of the disulfide bond alternatives or one more of the alternative peptide bonds described herein.

The various peptides can be present with a counterion. Useful counterions include salts of: acetate, benzenesulfonate, benzoate, calcium edetate, camsylate, carbonate, citrate, edetate (EDTA), edisylate, embonate, esylate, fumarate, gluceptate, gluconate, glutamate, glycollylarsanilate, hexylresorcinate, iodide, bromide, chloride, hydroxynaphthoate, isethionate, lactate, lactobionate, estolate, maleate, malate, mandelate, mesylate, mucate, napsylate, nitrate, pantothenate, phosphate, salicylate, stearate, succinate, sulfate, tartarate, theoclate, acetamidobenzoate, adipate, alginate, aminosalicylate, anhydromethylenecitrate, ascorbate, aspartate, camphorate, caprate, caproate, caprylate, cinnamate, cyclamate, dichloroacetate, formate, gentisate, glucuronate, glycerophosphate, glycolate, hippurate, fluoride, malonate, napadisylate, nicotinate, oleate, orotate, oxalate, oxoglutarate, palmitate, pectinate, pectinate polymer, phenylethylbarbiturate, picrate, propionate, pidolate, sebacate, rhodanide, tosylate, and tannate.

In a second aspect, the invention also features a therapeutic or prophylactic method comprising administering a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention. For the treatment of gastrointestinal disorders, the peptide can be administered orally, by rectal suppository or parenterally.

In various embodiments, the patient is suffering from a gastrointestinal disorder; the patient is suffering from a disorder selected from the group consisting of: gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD),

gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein); the patient is suffering from a gastrointestinal motility disorder, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, inflammatory bowel disease, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein); the composition is administered orally; the peptide comprises 30 or fewer amino acids, the peptide comprises 20 or fewer amino acids, and the peptide comprises no more than 5 amino acids prior to Xaa_6; the peptide comprises 150, 140, 130, 120, 110, 100, 90, 80, 70, 60, 50, 40, or 30 or fewer amino acids. In other embodiments, the peptide comprises 20 or fewer amino acids. In other embodiments the peptide comprises no more than 20, 15, 10, or 5 peptides subsequent to Xaa_{16}. In certain embodiments Xaa_{16} is a chymotrypsin or trypsin cleavage site and an analgesic peptide is present immediately following Xaa_{16}.

Among the useful peptides are those comprising, consisting of or consisting essentially of any of the following amino acid sequences:

SHTCEICAFAACAGC (opossum guanylin) (SEQ ID NO:);

PGTCEICAYAACTGC (human guanylin) (SEQ ID NO:);

PSTCEICAYAACAGC (pig guanylin) (SEQ ID NO:);

PNTCEICAYAACTGC (rat guanylin) (SEQ ID NO:);

PDPCEICANAACTGCL (European eel guanylin, inferred) (SEQ ID NO:);

NDDCELCVNVACTGCL (human uroguanylin) (SEQ ID NO:);

QEECELCINMACTGY (opossum lymphoguanylin) (SEQ ID NO:);

GDDCELCVNVACTGCS (pig uroguanylin) (SEQ ID NO:);

NDECELCVNIACTGC (guinea pig uroguanylin) (SEQ ID NO:);

TDECELCINVACTGC (rat uroguanylin) (SEQ ID NO:);

QEDCELCINVACTGC (opossum uroguanylin) (SEQ ID NO:);

MPSTQYIRRPASSYASCIWCTTACASCHGRTTKPSLAT (EAST 1) (SEQ ID NO:);

MPSTQYIRRPASSYASCIWCATACASCHGRTTKPSLAT (SEQ ID NO:);

MPSTQYIRRPTSSYASCIWCATACASCHGRTTKPSLAT (SEQ ID NO:);

MPSTQYIRRPTSSYASCIWCATVCASCHGRTTKPSLAT (SEQ ID NO:);

MPSTQYIRRPASSYASCIWYATACASCHGRTTEPSLAT (SEQ ID NO:);

QEECELSINMACTGY (opossum lymphoguanylin analog) (SEQ ID NO:);

YDECEICMFAACTGC (Japanese eel guanylin) (SEQ ID NO:);

VCEICAFAACTGC (Zebrafish guanylin, inferred) (SEQ ID NO:);

ADLCEICAFAACTGCL (Japenese eel renoguanylin, inferred) (SEQ ID NO:);

PGTCEICAYAACTGCL (SEQ ID NO:);

PGTCEICAYAACTGCLKK (SEQ ID NO:);

PNTCEICAYAACTGCKKKKKK (SEQ ID NO:);

PNTCEICAYAACTGCD (SEQ ID NO:);

PNTCEICAYAACTGCDK (SEQ ID NO:);

YPNTCEICAYAACTGC (SEQ ID NO:);

KNTCEICAYAACTGC (SEQ ID NO:);

KPNTCEICAYAACTGC (SEQ ID NO:);

EDPGTCEICAYAACTGC (SEQ ID NO:);

VTVQDG NFSFSLESVK KLKDLQEPQE PRVGKLRNFA PIPGEPVVPI LCSNPNFPEE LKPLCKEPNA QEILQRLEEIAEDPGTCEICAYAACTGC (SEQ ID NO:);

DPGTCEICAYAACTGC (SEQ ID NO:);

MNAFLLSALC LLGAWAALAG GVTVQDGNFS FSLESVKKLK DLQEPQEPRV GKLRNFAPIP GEPVVPILCS NPNFPEELKP LCKEPNAQEI LQRLEEIAED PGTCEICAYAACTGC (SEQ ID NO:);

MNAFLLFALC LLGAWAALAG GVTVQDGNFS FSLEPRVGKL RNFAPIPGEP VVPILCSNPN FPEELKPLCK EPNAQEILQR LEEIAEDPGTCEICAYAACTGC (SEQ ID NO:);

TGSMNAFLLF ALCLLGAWAA LAGGVTVQDG NFSFSLEPRV GKLRNFAPIP GEPVVPILCS NPNFPEELKP LCKEPNAQEI LQRLEEIAEDPGTCEICAYAACTGCLEG (SEQ ID NO:);

NDECELCVNVACTGCL (SEQ ID NO:);

ECELCVNVACTGCL (SEQ ID NO:);

EDCELCINVACTGC (SEQ ID NO:);

NDDCELCVACTGCL (SEQ ID NO:);

FKTLRTIANDDCELCVNVACTGCL (SEQ ID NO:);

FKTLRTIANDDCLCVNVACTGCL (SEQ ID NO:);

DDCELCVNVACTGCL (SEQ ID NO:);

DCELCVNVACTGCL (SEQ ID NO:);

CELCVNVACTGCL (SEQ ID NO:);

KDDCELCVNVACTGCL (SEQ ID NO:);

PNTCEICANPACTGC (SEQ ID NO.);

NDDCELCVNVACTGCS (cow uroguanylin) (SEQ ID NO:....);

PDVCDVCAFAACSGC (Xenopus guanylin) (SEQ ID NO....);

LDLCEICAFAACTGC (Fugu guanylin) (SEQ ID NO....);

VDVCEICAFAACTGC (Zebrafish guanylin) (SEQ ID NO...);

LDICEICAFAACTGC (Pufferfish guanylin) (SEQ ID NO...);

ADLCEICANAACSGCF (chicken uroguanylin) (SEQ ID NO...);

LDPCEICANPSCFGCLN (fugu uroguanylin) (SEQ ID NO...);

IDPCEICANVACTGC (eel uroguanylin) (SEQ ID NO..);

SDPCEICANPSCFGCLD (killifish uroguanylin) (SEQ ID NO..);

PGTCEICAYAACTAC (SEQ ID NO.);

PGTCEICAYAACAGC (SEQ ID NO.);

PGTCEICAAAACTGC (SEQ ID NO.);

PGTCEACAYAACTGC (SEQ ID NO.);

PGTCAICAYAACTGC (SEQ ID NO.)

PGACEICAYAACTGC (SEQ ID NO.);

PATCEICAYAACTGC (SEQ ID NO.);

AGTCEICAYAACTGC (SEQ ID NO.);

PTCEICAYAACTGC (SEQ ID NO.);

PGTCEICVNVACTGC (SEQ ID NO.);

PGTCEICANPACTGC (SEQ ID NO.);

PGTCEICAYAACTCC (SEQ ID NO.);

PGTCEICAYAACTDC (SEQ ID NO.);

PGTCEICAYAACTEC (SEQ ID NO.);

PGTCEICAYAACTFC (SEQ ID NO.);

PGTCEICAYAACTHC (SEQ ID NO.);

PGTCEICAYAACTIC (SEQ ID NO.);

PGTCEICAYAACTKC (SEQ ID NO.);

PGTCEICAYAACTLC (SEQ ID NO.);

PGTCEICAYAACTMC (SEQ ID NO.);

PGTCEICAYAACTNC (SEQ ID NO.);

PGTCEICAYAACTPC (SEQ ID NO.);

PGTCEICAYAACTQC (SEQ ID NO.);

PGTCEICAYAACTRC (SEQ ID NO.);

PGTCEICAYAACTSC (SEQ ID NO.);

PGTCEICAYAACTTC (SEQ ID NO.);

PGTCEICAYAACTVC (SEQ ID NO.);

PGTCEICAYAACTWC (SEQ ID NO.);

PGTCEICAYAACTYC (SEQ ID NO.);

NDDCELCVNVACTGCA (SEQ ID NO..);

NDDCELCVNVACTACL (SEQ ID NO..);

NDDCELCVNVACAGCL (SEQ ID NO..);

NDDCELCVNAACTGCL (SEQ ID NO..);

NDDCELCVAVACTGCL (SEQ ID NO..);

NDDCELCANVACTGCL (SEQ ID NO..);

NDDCEACVNVACTGCL (SEQ ID NO..);

NDDCALCVNVACTGCL (SEQ ID NO..);

NDACELCVNVACTGCL (SEQ ID NO..);

NADCELCVNVACTGCL (SEQ ID NO..);

ADDCELCVNVACTGCL (SEQ ID NO..);

NDDCELCAYAACTGCL (SEQ ID NO..);

NDDCELCVNPACTGCL (SEQ ID NO..);

LRTIATDECELCINVACTGC (SEQ ID NO.)

The peptides can include the amino acid sequence of a peptide that occurs naturally in a vertebrate (e.g., mammalian) species or in a bacterial species. In addition, the peptides can be partially or completely non-naturally occurring peptides.

In a third aspect, the invention features a method for treating a patient suffering from constipation, the method comprising administering a composition comprising a peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention. Clinically accepted criteria that define constipation range from the frequency of bowel movements, the consistency of feces and the ease of bowel movement. One common definition of constipation is less than three bowel movements per week. Other definitions include abnormally hard stools or defecation that requires excessive straining (Schiller 2001 *Aliment Pharmacol Ther* 15:749-763). Constipation may be idiopathic (functional constipation or slow transit constipation) or secondary to other

causes including neurologic, metabolic or endocrine disorders. These disorders include diabetes mellitus, hypothyroidism, hyperthyroidism, hypocalcaemia, Multiple sclerosis, Parkinson's disease, spinal cord lesions, Neurofibromatosis, autonomic neuropathy, Chagas disease, Hirschsprung disease and cystic fibrosis. Constipation may also be the result of surgery or due to the use of drugs such as analgesics (like opioids), antihypertensives, anticonvulsants, antidepressants, antispasmodics and antipsychotics.

In various embodiments, the constipation is associated with use of a therapeutic agent; the constipation is associated with a neuropathic disorder; the constipation is post-surgical constipation; the constipation is associated with a gastrointestinal disorder; the constipation is idiopathic (functional constipation or slow transit constipation); the constipation is associated with neuropathic, metabolic or endocrine disorder (e.g., diabetes mellitus, hypothyroidism, hyperthyroidism, hypocalcaemia, Multiple Sclerosis, Parkinson's disease, spinal cord lesions, neurofibromatosis, autonomic neuropathy, Chagas disease, Hirschsprung disease or cystic fibrosis). Constipation may also be the result of surgery or due to the use of drugs such as analgesics (e.g., opioids), antihypertensives, anticonvulsants, antidepressants, antispasmodics and antipsychotics.

In a fourth aspect, the invention features a method for treating a patient suffering from a gastrointestinal disorder, the method comprising administering to the patient a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO: 1 or another peptide or agonist of the invention.

In various embodiments, the patient is suffering from a gastrointestinal disorder; the patient is suffering from a disorder selected from the group consisting of: gastrointestinal motility disorders, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation

associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein), obesity, congestive heart failure, or benign prostatic hyperplasia

In a fifth aspect, the invention features a method for increasing gastrointestinal motility in a patient, the method comprising administering to the patient a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention.

In a sixth aspect, the invention features a method for decreasing gastrointestinal pain or visceral pain in a patient, the method comprising administering to the patient a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention.

In a seventh aspect, the invention features a method for increasing the activity of an intestinal guanylate cyclase (GC-C) receptor in a patient, the method comprising administering to the patient a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention.

In an eighth aspect, the invention features an isolated nucleic acid molecule comprising a nucleotide sequence encoding a peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention.

In a ninth aspect, the invention features a composition comprising a purified polypeptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention. In an embodiment, the composition is a pharmaceutical composition.

In a tenth aspect, the invention features a method for treating obesity, the method comprising administering a composition comprising a purified peptide comprising, consisting essentially of

or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention. The peptide can be administered in combination with one or more agents for treatment of obesity, including, without limitation, the anti-obesity agents described herein. A peptide useful for treating obesity can be administered as a co-therapy with a peptide of the invention either as a distinct molecule or as part of a fusion protein with a peptide of the invention. Thus, for example, PYY_{3-36} can be fused to the carboxy or amino terminus of a peptide of the invention. Such a fusion protein can include a chymostrypsin or trypsin cleavage site that can permit cleavage to separate the two peptides.

In an eleventh aspect, the invention features a method for treating congestive heart failure, the method comprising: administering to the patient a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention. The peptide can be administered in combination with one or more agents for treatment of congestive heart failure, for example, a natriuretic peptide such as atrial natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide), a diuretic, or an inhibitor of angiotensin converting enzyme.

In a twelfth aspect, the invention features a method for treating benign prostatic hyperplasia, the method comprising: administering to the patient a composition comprising a purified peptide comprising, consisting essentially of or consisting of the amino acid sequence of SEQ ID NO:1 or another peptide or agonist of the invention. The peptide can be administered in combination with one or more agents for treatment of BPH, for example, a 5-alpha reductase inhibitor (e.g., finasteride) or an alpha adrenergic inhibitor (e.g., doxazosine).

In a thirteenth aspect, the invention features a method for treating a patient suffering from a gastrointestinal disorder, the method comprising administering to the patient a composition comprising a complete or partial agonist of the GC-C receptor, including but not limited to the peptides and agonists described herein. In various embodiments, the disorder is a gastrointestinal motility disorder, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, duodenogastric reflux, dyspepsia, functional dyspepsia, nonulcer dyspepsia, a functional

gastrointestinal disorder, functional heartburn, gastroesophageal reflux disease (GERD), gastroparesis, irritable bowel syndrome, post-operative ileus, ulcerative colitis, chronic constipation, and disorders and conditions associated with constipation (e.g. constipation associated with use of opiate pain killers, post-surgical constipation, and constipation associated with neuropathic disorders as well as other conditions and disorders are described herein), obesity, congestive heart failure, or benign prostatic hyperplasia. In various embodiments the composition comprising an agonist of the intestinal guanylate cyclase (GC-C) receptor is administered orally, by rectal suppository, or parenterally. In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes two Cys, the peptide includes four Cys that form two disulfide bonds, the peptide includes four Cys, two of which form a disulfide bond.

In a fourteenth aspect, the invention features a method for treating a patient suffering from constipation, the method comprising administering a composition comprising a complete or partial agonist of the GC-C receptor. In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes two Cys, the peptide includes four Cys that form two disulfide bonds, the peptide includes four Cys, two of which form a disulfide bond. In various embodiments, the constipation is associated with the use of a therapeutic agent (e.g. antihypertensives, anticonvulsants, antispasmodics, analgesics, anticholinergics, antidepressants, antipsychotics, cation-containing agents, anticonvulsants, ganglion blockers, vinca alkaloids); associated with a muscular, neuropathic, metabolic or endocrine disorder (including but not limited to myotonic dystrophy, dermamyositis, systemic sclerosis, sclerodoma, amyloidosis (neurologic or muscular), ischemia, tumor of the central nervous system, autonomic neuropathy, Chagas disease, cystic fibrosis, diabetes mellitus, Hirschsprung disease, hyperthyroidism, hypocalcaemia, hypothyroidism, Multiple Sclerosis, neurofibromatosis, Parkinson's disease, and spinal cord lesions (for example, related to sacral nerve damage related to trauma or a tumor or the enteric nervous system)); post-surgical constipation (postoperative ileus); associated with a structural colon alteration (for example that associated with Neoplasm, stricture, volvulus, anorectal, inflammation, prolapse, rectocele, or fissure); associated with the a gastrointestinal disorder; associated with a systemic illness or

disorder (for example, electrolyte abnormalities, thyroid disease, diabetes mellitus, panhypopituitarism, Addison's disease, pheochromocytoma, uremia, porphyria); chronic constipation; associated with the use of analgesic drugs (e.g. opioid induced constipation); associated with megacolon; idiopathic constipation; functional constipation; functional constipation associated with normal transit, slow transit (e.g. one or fewer bowel movements per week) or pelvic floor dyssynergia; associated with bloating and abdominal pain.

In a fifteenth aspect, the invention features a method for increasing gastrointestinal motility in a patient, the method comprising administering to the patient a composition comprising a complete or partial agonist of the GC-C receptor, including but not limited to the peptides and agonists described herein.

In a sixteenth aspect, the invention features a method for decreasing gastrointestinal pain or visceral pain in a patient, the method comprising administering to the patient a composition comprising a complete or partial agonist of the GC-C receptor, including but not limited to the peptides and agonists described herein.

In a seventeenth aspect, the invention features a method for treating congestive heart failure, the method comprising administering a complete or partial agonist of the GC-C receptor, including but not limited to the peptides and agonists described herein. GC-C agonists can act in the kidney and adrenal gland to control natriuresis, kaliuresis, and diuresis thereby reducing the build-up of fluid associated with congestive heart failure (Lorenz et al. *J Clin Invest* 112:1138, 2003; Carrithers et al. *Kidney Int* 65:40, 2004). The agonist can be administered in combination with one or more agents for treatment of congestive heart failure, including but not limited to the agents useful for combitherapy described herein. For example, the agonist can be administered in combination with a natriuretic peptide such as atrial natriuretic peptide, brain natriuretic peptide or C-type natriuretic peptide), a diuretic, or an inhibitor of angiotensin converting enzyme.

In an eighteenth aspect, the invention features a method for treating BPH, the method comprising administering a complete or partial agonist of the GC-C receptor, including but not limited to the

peptides described herein. GC-C agonists acting in the prostate can reduce cellular hypertrophy and complications associated with cellular hypertrophy. The agonist can be administered in combination with one or more agents for treatment of BPH, for example, a 5-alpha reductase inhibitor (e.g., finasteride) or an alpha adrenergic inhibitor (e.g., doxazosine).

In a nineteenth aspect, the invention features a method for treating obesity, the method comprising administering a complete or partial agonist of the GC-C receptor, including but not limited to the peptides and agonists described herein. The agonist can be administered alone or in combination with one or more agents for treatment of obesity, including but not limited to the anti-obesity agents described herein. Thus, for example, PYY_{3-36} can be fused to the carboxy or amino terminus of a peptide of the invention. Such a fusion protein can include a chymostrypsin or trypsin cleavage site that can permit cleavage to separate the two peptides.

In various embodiments: the agonist is a peptide, the peptide includes two Cys that form one disulfide bond, the peptide includes two Cys, the peptide includes four Cys that form two disulfide bonds, the peptide includes four Cys, two of which form a disulfide bond.

The peptides and agonists of the GC-C receptor, including but not limited to the peptides and agonists described herein can be used to treat, for example, constipation, decreased intestinal motility, slow digestion, slow stomach emptying. The peptides can be used to relieve one or more symptoms of IBS (bloating, pain, constipation), GERD (acid reflux into the esophagus), duodenogastric reflux, functional dyspepsia, or gastroparesis (nausea, vomiting, bloating, delayed gastric emptying) and other disorders described herein.

Clinically accepted criteria that define constipation range from the frequency of bowel movements, the consistency of feces and the ease of bowel movement. One common definition of constipation is less than three bowel movements per week. Other definitions include abnormally hard stools or defecation that requires excessive straining (Schiller 2001, Aliment Pharmacol Ther 15:749-763). Constipation may be idiopathic (functional constipation or slow transit constipation) or secondary to other causes including neurologic, metabolic or endocrine disorders. These disorders include diabetes mellitus, hypothyroidism, hyperthyroidism,

hypocalcaemia, Multiple Sclerosis, Parkinson's disease, spinal cord lesions, Neurofibromatosis, autonomic neuropathy, Chagas disease, Hirschsprung's disease and cystic fibrosis. Constipation may also be the result of surgery or due to the use of drugs such as analgesics (like opioids), antihypertensives, anticonvulsants, antidepressants, antispasmodics and antipsychotics.

In a twentieth aspect, the invention features isolated nucleic acid molecules comprising or consisting of a sequence encoding a peptide of the invention. The invention also features vectors, e.g., expression vectors that include such nucleic acid molecules and can be used to express a peptide of the invention in a cultured cell (e.g., a eukaryotic cell or a prokaryotic cell). The vector can further include one or more regulatory elements, e.g., a heterologous promoter or elements required for translation operably linked to the sequence encoding the peptide. In some cases the nucleic acid molecule will encode an amino acid sequence that includes the amino acid sequence of a peptide of the invention. For example, the nucleic acid molecule can encode a preprotein or a preproprotein that can be processed to produce a peptide of the invention.

A vector that includes a nucleotide sequence encoding a peptide of the invention or a peptide or polypeptide comprising a peptide of the invention may be either RNA or DNA, single- or double-stranded, prokaryotic, eukaryotic, or viral. Vectors can include transposons, viral vectors, episomes, (e.g., plasmids), chromosomes inserts, and artificial chromosomes (e.g. BACs or YACs). Suitable bacterial hosts for expression of the encode peptide or polypeptide include, but are not limited to, *E. coli*. Suitable eukaryotic hosts include yeast such as *S. cerevisiae*, other fungi, vertebrate cells, invertebrate cells (e.g., insect cells), plant cells, human cells, human tissue cells, and whole eukaryotic organisms. (e.g., a transgenic plant or a transgenic animal). Further, the vector nucleic acid can be used to generate a virus such as vaccinia or baculovirus (for example using the Bac-to-Bac® Baculovirus expression system (Invitrogen Life Technologies, Carlsbad, CA)).

As noted above the invention includes vectors and genetic constructs suitable for production of a peptide of the invention or a peptide or polypeptide comprising such a peptide. Generally, the genetic construct also includes, in addition to the encoding nucleic acid molecule, elements that

allow expression, such as a promoter and regulatory sequences. The expression vectors may contain transcriptional control sequences that control transcriptional initiation, such as promoter, enhancer, operator, and repressor sequences. A variety of transcriptional control sequences are well known to those in the art and may be functional in, but are not limited to, a bacterium, yeast, plant, or animal cell. The expression vector can also include a translation regulatory sequence (e.g., an untranslated 5' sequence, an untranslated 3' sequence, a poly A addition site, or an internal ribosome entry site), a splicing sequence or splicing regulatory sequence, and a transcription termination sequence. The vector can be capable of autonomous replication or it can integrate into host DNA.

The invention also includes isolated host cells harboring one of the forgoing nucleic acid molecules and methods for producing a peptide by culturing such a cell and recovering the peptide or a precursor of the peptide. Recovery of the peptide or precursor may refer to collecting the growth solution and need not involve additional steps of purification. Proteins of the present invention, however, can be purified using standard purification techniques, such as, but not limited to, affinity chromatography, thermaprecipitation, immunoaffinity chromatography, ammonium sulfate precipitation, ion exchange chromatography, filtration, electrophoresis and hydrophobic interaction chromatography.

The peptides can be purified. Purified peptides are peptides separated from other proteins, lipids, and nucleic acids or from the compounds from which is it synthesized. The polypeptide can constitute at least 10, 20, 50 70, 80 or 95% by dry weight of the purified preparation.

In a twenty first aspect, the invention features a method of increasing the level of cyclic guanosine 3'-monophosphate (cGMP) in an organ, tissue (e.g, the intestinal mucosa), or cell (e.g., a cell bearing GC-A receptor) by administering a composition that includes a peptide of the invention.

In twenty second aspect, the invention features a method for treating a disorder ameliorated by increasing cGMP levels, the method comprising administering a pharmaceutical composition

comprising, consisting essentially of or consisting of SEQ ID NO. 1 or a peptide or agonist of the invention and a pharmaceutically acceptable carrier.

In a twenty third aspect, the invention features a method for preparing a polypeptide of SEQ NO:1 or any of the other polypeptides described herein by: chemically synthesizing the polypeptide and at least partially purifying the synthesized polypeptide.

In a twenty fourth, the invention features a method for preparing a polypeptide of SEQ ID NO:1 or any of the other polypeptides described herein by: providing a host cells (e.g., a bacterial or mammalian or insect cell) harboring a nucleic acid molecule encoding the polypeptide, culturing the cell under conditions suitable for expression of the polypeptide, and at least partially purifying the polypeptide from the cell or the culture media in which the cell is cultured.

In a twenty fifth aspect, the invention features a method for treating inflammation, including inflammation of the gastrointestinal tract, e.g., inflammation associated with a gastrointestinal disorder or infection or some other disorder, the method comprising administering to a patient a pharmaceutical composition comprising a purified peptide comprising, consisting of or consisting essentially of polypeptide of SEQ ID NO:1 or any of the other polypeptides described herein. In various embodiments the inflammation is associated with a gastrointestinal disorder, the inflammation is not associated with a gastrointestinal disorder.

In a twenty-sixth aspect, the invention features a method for treating hypertension The method comprises: administering to the patient a pharmaceutical composition comprising, consisting essentially of, or consisting of a peptide or agonist of the invention and a pharmaceutically acceptable carrier. The composition can be administered in combination with another agent for treatment of hypertension, for example, a diuretic, an ACE inhibitor, an angiotensin receptor blocker, a beta-blocker, or a calcium channel blocker.

In a twenty-seventh aspect, the invention features a method for treating secondary hyperglycemias in connection with pancreatic diseases (chronic pancreatitis, pancreasectomy,

hemochromatosis) or endocrine diseases (acromegaly, Cushing's syndrome, pheochromocytoma or hyperthyreosis), drug-induced hyperglycemias (benzothiadiazine saluretics, diazoxide or glucocorticoids), pathologic glucose tolerance, hyperglycemias, dyslipoproteinemias, adiposity, hyperlipoproteinemias and/or hypotensions is described. The method comprises: administering to the patient a pharmaceutical composition comprising, consisting essentially of, or consisting of a peptide or agonist of the invention and a pharmaceutically acceptable carrier.

Also described are therapeutic methods employing any of the forgoing polypeptides (both with and without the proviso. The therapeutic methods include treating a disorder selected from the group consisting of: a gastrointestinal disorder, cystic fibrosis, congestive heart failure, benign prostatic hyperplasia, the method comprising administering a composition comprising any of the forgoing polypeptides (both with and without the proviso). The disorders that can be treated include: a gastrointestinal motility disorder, irritable bowel syndrome, chronic constipation, a functional gastrointestinal disorder, gastroesophageal reflux disease, functional heartburn, dyspepsia, functional dyspepsia, nonulcer dyspepsia, gastroparesis, chronic intestinal pseudo-obstruction, colonic pseudo-obstruction, Crohn's disease, ulcerative colitis, and inflammatory bowel disease as well as other diseases and disorders described herein.

Also described are methods for producing any of the forgoing polypeptides comprising providing a cell harboring a nucleic acid molecule encoding the polypeptide, culturing the cell under conditions in which the peptide is expressed, and isolating the expressed peptide.

Also described are methods for producing any of the forgoing polypeptides comprising chemically synthesizing the peptide and then purifying the synthesized peptide.

Also described are pharmaceutical compositions comprising the forgoing polypeptides.

Also described are nucleic acid molecules encoding any of the forgoing polypeptides, vectors (e.g., expression vectors) containing such nucleic acid molecules and host cells harboring the nucleic acid molecules or vectors.

The details of one or more embodiments of the invention are set forth in the accompanying description. All of the publications, patents and patent applications are hereby incorporated by reference.

DRAWINGS

FIG.1 depicts deletion variants of human guanylin in which one, two, three or four amino acids are deleted. The deleted amino acids are between Cys_a and Cys_d as well as amino terminal to Cys_a.

FIG. 2 depicts insertion variants of human guanylin in which one, two, three or four amino acids are inserted. The inserted amino acids are between Cys_a and Cys_d as well as amino terminal to Cys_a and carboxy terminal to Cys_d.

FIG. 3 depicts various polypeptides which include the amino acid sequence: Xaa_1 Xaa_2 Xaa_3 Cys_4 Xaa_5 Xaa_6 Xaa_7 Xaa_8 Xaa_9 Xaa_{10} Xaa_{11} Cys_{12} Xaa_{13} Xaa_{14} Xaa_{15} Xaa_{16} (SEQ ID NO:1) wherein: Xaa_1 is any amino acid or is missing; Xaa_2 is any amino acid or is missing; Xaa_3 is any amino acid or is missing; Xaa_5 is Glu; Xaa_6 is Tyr, Trp, Phe or Leu; Xaa_7 is Cys; Xaa_8 is any of the 20 naturally-occurring amino acids other than Cys or is missing; Xaa_9 is any of the 20 naturally-occurring amino acids; Xaa_{10} is Pro or Gly; Xaa_{11} is any of the 20 naturally-occurring amino acids; Xaa_{13} is Thr, Val or Gly; Xaa_{14} is Gly or Ala; Xaa_{15} is Cys; and Xaa_{16} is any of the 20 naturally-occurring amino acids or is missing.

DETAILED DESCRIPTION

The peptides of the invention bind to the guanylate cyclase (GC-C) receptor, a key regulator of fluid and electrolyte balance in the intestine and kidney. When stimulated, this receptor, which is located on the apical membrane of the intestinal epithelial surface, causes an increase in intestinal epithelial cyclic GMP (cGMP). This increase in cGMP is believed to cause a decrease

in water and sodium absorption and an increase in chloride and potassium ion secretion, leading to changes in intestinal fluid and electrolyte transport and increased intestinal motility. The intestinal GC-C receptor possesses an extracellular ligand binding region, a transmembrane region, an intracellular protein kinase-like region and a cyclase catalytic domain. Proposed functions for the GC-C receptor are the fluid and electrolyte homeostasis, the regulation of epithelial cell proliferation and the induction of apoptosis (Shailhubhai 2002 *Curr Opin Drug Dis Devel* 5:261-268).

In addition to being expressed in gastrointestinal epithelial cells, GC-C is expressed in extra-intestinal tissues including kidney, lung, pancreas, pituitary, adrenal, developing liver, heart and male and female reproductive tissues (reviewed in Vaandrager 2002 *Mol Cell Biochem* 230:73-83). This suggests that the GC-C receptor agonists can be used in the treatment of disorders outside the GI tract, for example, congestive heart failure and benign prostatic hyperplasia.

Ghrelin, a peptide hormone secreted by the stomach, is a key regulator of appetite in humans. Ghrelin expression levels are regulated by fasting and by gastric emptying. (Kim et al., 2003, Neuroreprt 14:1317-20; Gualillo et al., 2003, FEBS Letts 552: 105-9). Thus, by increasing gastrointestinal motility, GC-C receptor agonists may also be used to regulate obesity.

In humans, the GC-C receptor is activated by guanylin (Gn) (U.S. Patent 5,96,097), uroguanylin (Ugn) (U.S. Patent 5,140,102) and lymphoguanylin (Forte et al. 1999 *Endocrinology* 140:1800-1806).

Many gastrointestinal disorders, including IBS, are associated with abdominal or visceral pain. Certain of the peptides of the invention include the analgesic or anti-nociceptive tags such as the carboxy-terminal sequence AspPhe immediately following a Trp, Tyr or Phe (i.e., a chymotrypsin cleavage site) or following Lys or Arg (a trypsin cleavage site). Chymotrypsin in the intestinal tract will cleave such peptides immediately carboxy terminal to the Trp, Phe or Tyr residue, releasing the dipeptide, AspPhe. This dipeptide has been shown to have analgesic activity is animal models (Abdikkahi et al. 2001 *Fundam Clin Pharmacol* 15:117-23; Nikfar et al 1997, 29:583-6; Edmundson et al 1998 *Clin Pharmacol Ther* 63:580-93). In this manner such

peptides can treat both pain and inflammation. Other analgesic peptides can be present at the carboxy terminus of the peptide (following a cleavage site) including: endomorphin-1, endomorphin-2, nocistatin, dalargin, lupron, ziconotide, and substance P. As described in greater detail below, various analgesic peptides and compounds can be covalently linked to or used in combination therapy with the therapeutic peptides described herein.

In the human body an inactive form of chymotrypsin, chymotrypsinogen is produced in the pancreas. When this inactive enzyme reaches the small intestine it is converted to active chymotrypsin by the excision of two di-peptides. Active chymotrypsin will cleave peptides at the peptide bond on the carboxy-terminal side of Trp, Tyr or Phe. The presence of active chymotrypsin in the intestinal tract will lead to cleavage of certain of the peptides of the invention having an appropriately positioned chymotrypsin cleavage site. Certain of the peptides of the invention include a Trp, Tyr or Phe immediately followed by a carboxy-terminal analgesic peptide. It is expected that chymotrypsin cleavage will release the analgesic peptide from peptide of the invention having an appropriately positioned chymotrypsin cleavage site as the peptide passes through the intestinal tract.

Trypsinogen, like chymotrypsin, is a serine protease that is produced in the pancreas and is present in the digestive tract. The active form, trypsin, will cleave peptides having a Lys or Arg. The presence of active trypsin in the intestinal tract will lead to cleavage of certain of the peptides of the invention having an appropriately positioned trypsin cleavage site. It is expected that chymotrypsin cleavage will release the analgesic peptide from peptide of the invention having an appropriately positioned trypsin cleavage site as the peptide passes through the intestinal tract.

In some cases, the peptides of the invention are produced as a prepro protein. The prepro protein can include any suitable prepro sequence, including but not limited to, for example, mnafllsalc llgawaalag gvtvqdgnfs fslesvkklk dlqepqeprv gklrnfapip gepvvpilcs npnfpeelkp lckepnaqei lqrleeiaed (SEQ ID NO:), mgcraasgll pgvavvllll lqstqsvyiq yqgfrvqles mkklsdleaq wapsprlqaq sllpavchhp alpqdlqpvc asqeassifk tlrtia (SEQ ID NO:), lrtia (SEQ ID NO.), mnawllsvlc

llgalavlve gvtvqdgdls fplesvkqlk hlrevqeptl mshkkfalrl pkpvapelcs qsafpealrp lcekpnaeei lqrleaiaqd (SEQ ID NO:), and msgsqlwaav llllvlqsaq gvyikyhgfq vqlesvkkln eleekqmsdp qqqksgllpd vcynpalpld lqpvcasqea astfkalrti a (SEQ ID NO:) or a bacterial leader sequence such as: mkksilfiflsvlsfspfaqdakpvesskekitleskkcniakksnksgpesmn. Where the peptide is produced by a bacterial cell, e.g., *E. coli*, the forgoing leader sequence will be cleaved and the mature peptide will be efficiently secreted from the bacterial cell. U.S. Patent No. 5,395,490 describes vectors, expression systems and methods for the efficient production of certain mature peptides having disulfide bonds in bacterial cells and methods for achieving efficient secretion of such mature peptides. The vectors, expression systems and methods described in U.S. Patent No. 5,395,490 can be used to produce the polypeptides of the present invention.

Variant Peptides

The invention includes variant peptides that can include one, two, three, four, or five or more (e.g., 6, 7, 8, 9, 10, 11, 12, 13, 14, or 15) amino acid substitutions compared to any of the peptides described above. The substitution(s) can be conservative or non-conservative. The naturally-occurring amino acids can be substituted by D-isomers of any amino acid, non-natural amino acids, natural and non-natural amino acid analogs, and other groups. A conservative amino acid substitution results in the alteration of an amino acid for a similar acting amino acid, or amino acid of like charge, polarity, or hydrophobicity. At some positions, even conservative amino acid substitutions can reduce the activity of the peptide. A conservative substitution can substitute a naturally-occurring amino acid for a non-naturally-occurring amino acid. Among the naturally occurring amino acid substitutions generally considered conservative are:

For Amino Acid	Code	Replace with any of
Alanine	Ala	Gly, Cys, Ser
Arginine	Arg	Lys, His
Asparagine	Asn	Asp, Glu, Gln,
Aspartic Acid	Asp	Asn, Glu, Gln
Cysteine	Cys	Met, Thr, Ser
Glutamine	Gln	Asn, Glu, Asp
Glutamic Acid	Glu	Asp, Asn, Gln
Glycine	Gly	Ala
Histidine	His	Lys, Arg
Isoleucine	Ile	Val, Leu, Met
Leucine	Leu	Val, Ile, Met
Lysine	Lys	Arg, His
Methionine	Met	Ile, Leu, Val
Phenylalanine	Phe	Tyr, His, Trp
Proline	Pro	
Serine	Ser	Thr, Cys, Ala
Threonine	Thr	Ser, Met, Val
Tryptophan	Trp	Phe, Tyr
Tyrosine	Tyr	Phe, His
Valine	Val	Leu, Ile, Met

In some circumstances it can be desirable to treat patients with a variant peptide that binds to and activates intestinal GC-C receptor, but is less active or more active than the non-variant form of the peptide. Reduced activity can arise from reduced affinity for the receptor or a reduced ability to activate the receptor once bound or reduced stability of the peptide. Increased activity can arise from increased affinity for the receptor or an increased ability to activate the receptor once bound or increased stability of the peptide.

In some peptides one or both members of one or both pairs of Cys residues which normally form a disulfide bond can be replaced by homocysteine, penicillamine, 3-mercaptoproline (Kolodziej et al. 1996 *Int J Pept Protein Res* 48:274); β, β dimethylcysteine (Hunt et al. 1993 *Int J Pept Protein Res* 42:249) or diaminopropionic acid (Smith et al. 1978 *J Med Chem* 21:117) to form alternative internal cross-links at the positions of the normal disulfide bonds.

Production of peptides

Useful peptides can be produced either in bacteria including, without limitation, *E. coli*, or in other existing systems for peptide or protein production (e.g., *Bacillus subtilis*, baculovirus expression systems using Drosophila Sf9 cells, yeast or filamentous fungal expression systems, mammalian cell expression systems), or they can be chemically synthesized.

If the peptide or variant peptide is to be produced in bacteria, e.g., *E. coli*, the nucleic acid molecule encoding the peptide may also encode a leader sequence that permits the secretion of the mature peptide from the cell. Thus, the sequence encoding the peptide can include the pre sequence and the pro sequence of, for example, a naturally-occurring bacterial ST peptide. The secreted, mature peptide can be purified from the culture medium.

The sequence encoding a peptide of the invention is can be inserted into a vector capable of delivering and maintaining the nucleic acid molecule in a bacterial cell. The DNA molecule may be inserted into an autonomously replicating vector (suitable vectors include, for example, pGEM3Z and pcDNA3, and derivatives thereof). The vector nucleic acid may be a bacterial or bacteriophage DNA such as bacteriophage lambda or M13 and derivatives thereof. Construction of a vector containing a nucleic acid described herein can be followed by transformation of a host cell such as a bacterium. Suitable bacterial hosts include but are not limited to, *E. coli*, B *subtilis*, *Pseudomonas*, *Salmonella*. The genetic construct also includes, in addition to the encoding nucleic acid molecule, elements that allow expression, such as a promoter and regulatory sequences. The expression vectors may contain transcriptional control sequences that control transcriptional initiation, such as promoter, enhancer, operator, and repressor sequences. A variety of transcriptional control sequences are well known to those in the art. The expression vector can also include a translation regulatory sequence (e.g., an untranslated 5' sequence, an untranslated 3' sequence, or an internal ribosome entry site). The vector can be capable of autonomous replication or it can integrate into host DNA to ensure stability during peptide production.

The protein coding sequence that includes a peptide of the invention can also be fused to a nucleic acid encoding a polypeptide affinity tag, e.g., glutathione S-transferase (GST), maltose E binding protein, protein A, FLAG tag, hexa-histidine, myc tag or the influenza HA tag, in order to facilitate purification. The affinity tag or reporter fusion joins the reading frame of the peptide of interest to the reading frame of the gene encoding the affinity tag such that a translational fusion is generated. Expression of the fusion gene results in translation of a single polypeptide that includes both the peptide of interest and the affinity tag. In some instances where affinity tags are utilized, DNA sequence encoding a protease recognition site will be fused between the reading frames for the affinity tag and the peptide of interest.

Genetic constructs and methods suitable for production of immature and mature forms of the peptides and variants of the invention in protein expression systems other than bacteria, and well known to those skilled in the art, can also be used to produce peptides in a biological system.

Mature peptides and variants thereof can be synthesized by the solid-phase method using an automated peptide synthesizer. For example, the peptide can be synthesized on Cyc(4-CH_2 Bxl)-OCH_2-4-(oxymethyl)-phenylacetamidomethyl resin using a double coupling program. Protecting groups must be used appropriately to create the correct disulfide bond pattern. For example, the following protecting groups can be used: t-butyloxycarbonyl (alpha-amino groups); acetamidomethyl (thiol groups of Cys residues B and E); 4-methylbenyl (thiol groups of Cys residues C and F); benzyl (y-carboxyl of glutamic acid and the hydroxyl group of threonine, if present); and bromobenzyl (phenolic group of tyrosine, if present). Coupling is effected with symmetrical anhydride of t-butoxylcarbonylamino acids or hydroxybenzotriazole ester (for asparagine or glutamine residues), and the peptide is deprotected and cleaved from the solid support in hydrogen fluoride, dimethyl sulfide, anisole, and p-thiocresol using 8/1/1/0.5 ratio (v/v/v/w) at 0°C for 60 min. After removal of hydrogen fluoride and dimethyl sulfide by reduced pressure and anisole and p-thiocresol by extraction with ethyl ether and ethyl acetate sequentially, crude peptides are extracted with a mixture of 0.5M sodium phosphate buffer, pH 8.0 and N,N-dimethylformamide using 1/1 ratio, v/v. Disulfide bonds between Cys residues can be formed using dimethyl sulfoxide (Tam et al. (1991) J. Am. Chem. Soc. 113:6657-62). The

resulting peptide is the purified by reverse-phase chromatography. In some cases it may be necessary to first dissolve the peptide in 50% acetic acid in water before disulfide bond formation. Saturated iodine solution in glacial acetic acid is added (1 ml iodine solution per 100 ml solution). After incubation at room temperature for 2 days in closed glass container, the solution is diluted five-fold with deionized water and extracted with ethyl ether four times for removal of unreacted iodine. After removal of the residual amount of ethyl ether by rotary evaporation the solution of crude product is lyophilized and purified by successive reverse-phase chromatography.

Peptides can also be synthesized by many other methods including solid phase synthesis using traditional FMOC protection (i.e., coupling with DCC-HOBt and deprotection with piperdine in DMF). Cys thiol groups can be trityl protected. Treatment with TFA can be used for final deprotection of the peptide and release of the peptide from the solid-state resin. In many cases air oxidation is sufficient to achieve proper disulfide bond formation.

Intestinal GC-C Receptor Binding and Activity Assays

The ability of peptides, variant peptides and other compounds to bind to and activate the intestinal GC-C receptor can be tested using the T84 human colon carcinoma cell line (American Type Culture Collection (Bethesda, Md.).

Briefly, cells are grown to confluency in 24-well culture plates with a 1:1 mixture of Ham's F12 medium and Dulbecco's modified Eagle's medium (DMEM), supplemented with 5% fetal calf serum and are used at between passages 54 and 60.

Monolayers of T84 cells in 24-well plates are washed twice with 1 ml/well DMEM, then incubated at 37°C for 10 min with 0.45 ml DMEM containing 1 mM isobutylmethylxanthine (IBMX), a cyclic nucleotide phosphodiesterase inhibitor. Test peptides (50µl) are then added and incubated for 30 minutes at 37°C. The media is aspirated and the reaction is terminated by the addition of ice cold 0.5 ml of 0.1N HCl. The samples are held on ice for 20 minutes and then evaporated to dryness using a heat gun or vacuum centrifugation. The dried samples are

resuspended in 0.5ml of phosphate buffer provided in the Cayman Chemical Cyclic GMP EIA kit (Cayman Chemical, Ann Arbor, MI). Cyclic GMP is measured by EIA according to procedures outlined in the Cayman Chemical Cyclic GMP EIA kit.

For the binding assay, T84 cell monolayers in 24-well plates are washed twice with 1 ml of binding buffer (DMEM containing 0.05% bovine serum albumin and 25 mM HEPES, pH 7.2), then incubated for 30 min at 37°C in the presence of mature radioactively labeled *E. coli* ST peptide and the test material at various concentrations. The cells are then washed 4 times with 1 ml of DMEM and solubilized with 0.5 ml/well 1N NaOH. The level of radioactivity in the solubilized material is then determined using standard methods.

Murine gastrointestinal transit (GIT) assay

In order to determine whether a test compound or a peptide, increases the rate of gastrointestinal transit, the test compound can be tested in the murine gastrointestinal transit (GIT) assay (Moon et al. *Infection and Immunity* 25:127, 1979). In this assay, charcoal, which can be readily visualized in the gastrointestinal tract is administered to mice after the administration of a test compound. The distance traveled by the charcoal is measured and expressed as a percentage of the total length of the colon.

Mice are fasted with free access to water for 12 to 16 hours before the treatment with peptide or control buffer. The peptides are orally administered at 1μg/kg – 1mg/kg of peptide in buffer (20mM Tris pH 7.5) seven minutes before being given an oral dose of 5% Activated Carbon (Aldrich 242276-250G). Control mice are administered buffer only before being given a dose of Activated Carbon. After 15 minutes, the mice are sacrificed and their intestines from the stomach to the cecum are dissected. The total length of the intestine as well as the distance traveled from the stomach to the charcoal front is measured for each animal and the results are expressed as the percent of the total length of the intestine traveled by the charcoal front. Results are reported as the average of 10 mice ± standard deviation. A comparison of the distance traveled by the charcoal between the mice treated with peptide versus the mice treated with vehicle alone is performed using a Student's t test and a statistically significant difference is

considered for $P<0.05$. Positive controls for this assay may include commercially available wild-type ST peptide (Sigma-Aldrich, St Louis, MO) and Zelnorm®, a drug approved for IBS that is an agonist for the serotonin receptor 5HT4.

Similar assays can be performed in other rodents, for example, rats. In addition, GIT assays can be performed and compared in wild-type versus rodents lacking the guanylate cyclase C receptor (GC-C KO), for example, using the GC-C KO mice described in Mann et al 1997 Biochem and Biophysical Research Communications 239:463.

Suckling mouse model of intestinal secretion (SuMi assay)

The peptides of the invention can be tested for their ability to increase intestinal secretion using a suckling mouse model of intestinal secretion. In this model a test compound is administered to suckling mice that are between seven and nine days old. After the mice are sacrificed, the gastrointestinal tract from the stomach to the cecum is dissected ("guts"). The remains ("carcass") as well as the guts are weighed and the ratio of guts to carcass weight is calculated. If the ratio is above 0.09, one can conclude that the test compound increases intestinal secretion. Controls for this assay may include wild-type ST peptide and Zelnorm®.

Phenylbenzoquinone-induced writhing model

The PBQ-induced writhing model can be used to assess pain control activity of the peptides and GC-C receptor agonists of the invention. This model is described by Siegmund et al. (1957 Proc. Soc. Exp. Bio. Med. 95:729-731). Briefly, one hour after oral dosing with a test compound, e.g., a peptide, morphine or vehicle, 0.02% phenylbenzoquinone (PBQ) solution (12.5 mL/kg) is injected by intraperitoneal route into the mouse. The number of stretches and writhings are recorded from the 5^{th} to the 10^{th} minute after PBQ injection, and can also be counted between the 35^{th} and 40^{th} minute and between the 60^{th} and 65^{th} minute to provide a kinetic assessment. The results are expressed as the number of stretches and writhings (mean ± SEM) and the percentage of variation of the nociceptive threshold calculated from the mean value of the vehicle-treated group. The statistical significance of any differences between the treated groups and the control

group is determined by a Dunnett's test using the residual variance after a one-way analysis of variance ($P < 0.05$) using SigmaStat Software.

Colonic hyperalgesia animal models

Hypersensitivity to colorectal distension is a common feature in patients with IBS and may be responsible for the major symptom of pain. Both inflammatory and non-inflammatory animal models of visceral hyperalgesia to distension have been developed to investigate the effect of compounds on visceral pain in IBS.

I. Trinitrobenzenesulphonic acid (TNBS)-induced rectal allodynia model

Male Wistar rats (220-250 g) are premedicated with 0.5 mg/kg of acepromazine injected intraperitoneally (IP) and anesthetized by intramuscular administration of 100 mg/kg of ketamine. Pairs of nichrome wire electrodes (60 cm in length and 80 μm in diameter) are implanted in the striated muscle of the abdomen, 2 cm laterally from the white line. The free ends of electrodes are exteriorized on the back of the neck and protected by a plastic tube attached to the skin. Electromyographic (EMG) recordings are started 5 days after surgery. Electrical activity of abdominal striated muscle is recorded with an electroencephalograph machine (Mini VIII, Alvar, Paris, France) using a short time constant (0.03 sec.) to remove low-frequency signals (<3 Hz).

Ten days post surgical implantation, trinitrobenzenesulphonic acid (TNBS) is administered to induce rectal inflammation. TNBS (80 mg kg^{-1} in 0.3 ml 50 % ethanol) is administered intrarectally through a silicone rubber catheter introduced at 3 cm from the anus under light diethyl-ether anesthesia, as described (Morteau et al. 1994 Dig Dis Sci 39:1239). Following TNBS administration, rats are placed in plastic tunnels where they are severely limited in mobility for several days before colorectal distension (CRD). Experimental compound is administered one hour before CRD which is performed by insertion into the rectum, at 1 cm of the anus, a 4 cm long balloon made from a latex condom (Gue et al, 1997 *Neurogastroenterol. Motil.* 9:271). The balloon is fixed on a rigid catheter taken from an embolectomy probe

(Fogarty). The catheter attached balloon is fixed at the base of the tail. The balloon, connected to a barostat is inflated progressively by step of 15 mmHg, from 0 to 60 mmHg, each step of inflation lasting 5 min. Evaluation of rectal sensitivity, as measured by EMG, is performed before (1-2 days) and 3 days following rectal instillation of TNBS.

The number of spike bursts that corresponds to abdominal contractions is determined per 5 min periods. Statistical analysis of the number of abdominal contractions and evaluation of the dose-effects relationships is performed by a one way analysis of variance (ANOVA) followed by a post-hoc (Student or Dunnett tests) and regression analysis for ED50 if appropriate.

II. Stress-induced hyperalgesia model

Male Wistar Rats (200-250 g) are surgically implanted with nichrome wire electrodes as in the TNBS model. Ten days post surgical implantation, partial restraint stress (PRS), is performed as described by Williams et al. for two hours (Williams et al. 1988 Gastroenterology 64:611). Briefly, under light anaesthesia with ethyl-ether, the foreshoulders, upper forelimbs and thoracic trunk are wrapped in a confining harness of paper tape to restrict, but not prevent body movements. Control sham-stress animals are anaesthetized but not wrapped. Thirty minutes before the end of the PRS session, the animals are administered test-compound or vehicle. Thirty minutes to one hour after PRS completion, the CRD distension procedure is performed as described above for the TNBS model with barostat at pressures of 15, 30, 45 and 60mm Hg. Statistical analysis on the number of bursts is determined and analyzed as in the TNBS model above.

III. Water avoidance stress-induced hyperalgesia model

The effect of peptides/GC-C agonists of the invention on basal visceral nociception in a model of water avoidance stress-induced visceral hyperalgesia in adult male Wistar rats can be tested. The stress involves confining rats to a platform surrounded by water for a period of 1 hour and then measuring their visceromotor response to colonic distension using electromyography (EMG).

At least 7 days prior to stress measurements, animals are deeply anesthetized with pentobarbital sodium (45 mg/kg) and equipped with electrodes implanted into the external oblique musculature, just superior to the inguinal ligament. Electrode leads are then tunneled subcutaneously and externalized laterally for future access. Following surgery, rats are housed in pairs and allowed to recover for at least 7 days. On the day of the experiment, animals are lightly anesthetized with halothane, and a lubricated latex balloon (6 cm) is inserted intra-anally into the descending colon. Animals are allowed to recover for 30 minutes, and colorectal distension (CRD) is initiated. The CRD procedure consists of graded intensities of phasic CRD (10, 20, 40, 60 mmHg; 20 s duration; 4 min inter-stimulus interval). Visceromotor response (VMR) to CRD is quantified by measuring EMG activity. To determine the effects of peptides/GC-C agonists of the invention on basal visceral nociception, a baseline CRD is recorded. Animals are allowed 1 hour recovery and then the peptide/GC-C agonist of the invention or vehicle is orally administered. At 1 hour following administration of peptide/GC-C agonist of the invention or vehicle CRD is repeated.

To determine the effect of peptides/GC-C agonists of the invention in a model of water avoidance stress-induced visceral hyperalgesia, a baseline CRD is recorded and then the animals were subjected to 1 hour of water avoidance stress. For water avoidance stress, the test apparatus consists of a Plexiglas tank with a block affixed to the center of the floor. The tank is filled with fresh room temperature water (25°C) to within 1 cm of the top of the block. The animals are placed on the block for a period of 1 hour. The sham water avoidance stress consists in placing the rats on the same platform in a waterless container. A second CRD is performed at 24 hours post water avoidance stress. Following the second CRD, animals are allowed 1 hour recovery and then the peptide/GC-C agonist of the invention or vehicle is orally administered. At 1 hour following administration of peptide/GC-C agonist of the invention or vehicle CRD is repeated. Mean +/- SEM is be determined and compared in the presence and absence of water avoidance stress conditions.

Kd determination and binding assays

To determine the affinity of peptides/GC-C agonists of the invention for GC-C receptors found in rat intestinal mucosa, a competition binding assay is performed using rat intestinal epithelial cells. Epithelial cells from the small intestine of rats are obtained as described by Kessler et al. (*J. Biol. Chem.* 245: 5281-5288 (1970)). Briefly, animals are sacrificed and their abdominal cavities exposed. The small intestine is rinsed with 300 ml ice cold saline or PBS. 10 cm of the small intestine measured at 10 cm from the pylorus is removed and cut into 1 inch segments. Intestinal mucosa is extruded from the intestine by gentle pressure between a piece of parafilm and a P-1000 pipette tip. Intestinal epithelial cells are placed in 2 ml PBS and pipetted up and down with a 5 ml pipette to make a suspension of cells. Protein concentration in the suspension is measured using the Bradford method (*Anal. Biochem.* 72: 248-254 (1976)).

A competition binding assay is performed based on the method of Giannella et al. (*Am. J. Physiol.* 245: G492-G498) between [^{125}I] labeled control peptide (e.g. wild-type guanylin, uroguanylin or ST peptide) and a peptide/GC-C agonist of the invention. The assay mixture contains: 0.5 ml of DME with 20 mM HEPES-KOH pH 7.0, 0.9 mg of the cell suspension listed above, 21.4 fmol [^{125}I]- labeled control peptide (42.8 pM), and different concentrations of competitor peptide/GC-C agonist of the invention (0.01 to 1000 nM). The mixture is incubated at room temperature for 1 hour, and the reaction stopped by applying the mixture to GF/B glass-fiber filters (Whatman). The filters are washed with 5 ml ice-cold PBS and radioactivity is measured. Kd is determined. %B/Bo is the percentage of the ratio of radioactivity trapped in each sample (B) compared to the radioactivity retained in a control sample with no cold competitor (Bo).

Similar competition binding assays are performed in intestinal epithelial cells from wild-type and guanylate cyclase C knockout (GC-C KO; Mann et al. 1997 Biochem and Biophysical Research Communications 239:463) mice. Mouse intestinal epithelial cells are prepared identical to that above as for rat intestinal epithelial cells except the cells are homogenized with an Omni homogenizer for 20 seconds on the maximum setting to make a suspension of cells. A competition binding assay is performed identical to that described above between ^{125}I labeled

peptide/GC-C agonist of the invention and unlabeled peptide/GC-C agonist of the invention (competitor).

Pharmacokinetic property determination of peptides/GC-C agonists of the invention

Serum samples are extracted from the whole blood of exposed (mice dosed orally or intravenously with peptide(s) of the invention) and control mice, then injected directly (10mL) onto an in-line solid phase extraction (SPE) column (Waters Oasis HLB 25µm column, 2.0 x 15mm direct connect) without further processing. The sample on the SPE column is washed with a 5% methanol, 95% dH_2O solution (2.1 mL/min, 1.0 minute), then loaded onto an analytical column using a valve switch that places the SPE column in an inverted flow path onto the analytical column (Waters Xterra MS C8 5µm IS column, 2.1 x 20mm). The sample is eluted from the analytical column with a reverse phase gradient (Mobile Phase A: 10 mM ammonium hydroxide in dH_2O, Mobile Phase B: 10 mM ammonium hydroxide in 80% acetonitrile and 20% methanol; 20% B for the first 3 minutes then ramping to 95% B over 4 min. and holding for 2 min., all at a flow rate of 0.4 mL/min.). At 9.1 minutes, the gradient returns to the initial conditions of 20%B for 1 min. Peptide is eluted from the analytical column and is detected by triple-quadrapole mass spectrometry (MRM, 764 (+2 charge state)>182 (+1 charge state) Da; cone voltage = 30V; collision = 20 eV; parent resolution = 2 Da at base peak; daughter resolution = 2 Da at base peak). Instrument response is converted into concentration units by comparison with a standard curve using known amounts of chemically synthesized peptide(s) prepared and injected in mouse plasma using the same procedure.

Similarly, pharmacokinetic properties are determined in rats using LCMS methodology. Rat plasma samples containing the peptide are extracted using a Waters Oasis MAX 96 well solid phase extraction (SPE) plate. A 200 µL volume of rat plasma is mixed with 200 µL of $^{13}C_9$, ^{15}N –labeled peptide in the well of a prepared SPE plate. The samples are drawn through the stationary phase with 15 mm Hg vacuum. All samples are rinsed with 200 µL of 2% ammonium hydroxide in water followed by 200 µL of 20% methanol in water. The samples are eluted with consecutive 100 µL volumes of 5/20/75 formic acid/water/methanol and 100 µL 5/15/80 formic

acid/water/methanol. The samples are dried under nitrogen and resuspended in 100 µL of 20% methanol in water. Samples are analyzed by a Waters Quattro Micro mass spectrometer coupled to a Waters 1525 binary pump with a Waters 2777 autosampler. A 40 µL volume of each sample is injected onto a Thermo Hypersil GOLD C18 column (2.1x50 mm, 5 um). Peptide is eluted by a gradient over 3 minutes with acetonitrile and water containing 0.05% trifluoroacetic acid. The Quattro Micro mass spectrometer is run in multiple reaction monitoring (MRM) mode using the mass transitions of, for example 764>182 or 682>136. Using this methodology, peptide is dosed orally and by IV to rats at 10 mg/kg. Pharmacokinetic properties including area under the curve and bioavailabilty are determined.

In vitro proteolytic stability

The stability of peptides/GC-C agonists of the invention in the presence of several mammalian digestive enzymes is determined. Peptide/GC-C agonists of the invention are exposed to a variety of in vitro conditions including digestive enzymes and low ph environments designed to simulate gastric fluid. Peptide/GC-C agonists of the invention are incubated with chymotrypsin, trypsin, pepsin, aminopeptidase, carboxypeptidase A, and simulated gastric fluid (sgf) at ph 1.0. Samples are collected at 0, 3, and 24 h for all conditions except pepsin digestion and the SGF. For the latter two conditions, samples are obtained at 0, 1, and 3 h. Negative control samples are prepared for initial and final time points. A separate, positive activity control is run in parallel for each condition. All samples are analyzed by LC/MS.

Effect on Bowel Habits

Peptide/GC-C agonists of the invention can be administered to mammals (e.g. humans) to determine the effect on bowel habits (including Bristol Stool Form Scale score, stool frequency (number of stools per week), ease of passage and stool weight). Peptide/GC-C agonist is administered in a single dose or multiple doses (for example, once daily over a consecutive 7 day period) and alterations in bowel habit are evaluated (for each collected bowel movement), for example, prior to dose, during dosage (for multiple dosing), and postdose.

The Bristol Stool Form Scale is:

1: Separate hard lumps, like nuts

2: Sausage-shaped but lumpy

3: Like a sausage or snake but with cracks on its surface

4: Like a sausage or snake, smooth and soft

5: Soft blobs with clear-cut edges

6: Fluffy pieces with ragged edges, a mushy stool

7: Watery, no solid pieces

The scale used to determine ease of passage is:

1. Manual disimpaction

2 Enema needed

3. Straining needed

4. Normal

5. Urgent without pain

6. Urgent with pain

7. Incontinent

Rat model of postoperative ileus.

Female CD rats are used to test the effect of peptides/GC-C agonists of the invention on delayed transit induced by abdominal surgery and manual manipulation of the small intestine. Groups of at least nine rats undergo abdominal surgery under isoflurane anesthesia. Surgery consists of laparotomy and 5 minutes of gentle manual intestinal massage. Following recovery from anesthesia, rats are dosed orally with either peptide/GC-C agonist (for example, 10 μg/kg) of the invention or vehicle (20mM Tris) in a volume of 300μl. 1 hour after dosing, intestinal transit rate is measured. Animals are again dosed with 300μl of the test article followed immediately by 500μl of a charcoal meal (10% charcoal, 10% gum arabic in water). To calculate the distance of the small intestine traveled by the charcoal front, after 20 minutes, the total length of the intestine as well as the distance traveled from the stomach to the charcoal front are measured for each animal.

Effect on cGMP levels and secretion in ligated loops rodent models

The effect of peptides/GC-C agonists of the invention on cGMP levels and secretion are studied by injecting peptides/GC-C agonists of the invention directly into an isolated loop in either wild-type or GC-C KO mice. This is done by surgically ligating a loop in the small intestine of the mouse. The methodology for ligated loop formation is similar to that described in London et al. 1997 Am J Physiol p.G93-105. The loop is roughly centered and is a length of 1-3 cm. The loops are injected with 100µl of either SEQ ID NO:3 (5µg) or vehicle (20 mM Tris, pH 7.5 or Krebs Ringer, 10mM Glucose, HEPES buffer (KRGH)). Following a recovery time of 90 minutes the loops are excised. Weights are recorded for each loop before and after removal of the fluid contained therein. The length of each loop is also recorded. A weight to length ratio (W/L) for each loop is calculated to determine the effects of the peptide/GC-C agonist of the invention on secretion.

To determine the effect of the peptide/GC-C agonist of the invention on cGMP activity, fluid from the loop is collected in ice-cold trichloracetic acid (TCA) and stored at –80°C for use in an assay to measure cGMP levels in the fluid. Intestinal fluid samples are TCA extracted, and cyclic GMP is measured by EIA according to procedures outlined in the Cayman Chemical Cyclic GMP EIA kit (Cayman Chemical, Ann Arbor, MI) to determine cyclic GMP levels in the intestinal fluid of the mouse in the presence of either peptide/GC-C agonist of the invention or vehicle.

The effects of peptides/GC-C agonists of the invention on cGMP levels and secretion in ligated loops in female CD rats can also be determined using protocols similar to those described above. In the case of the rat, however four loops of intestine are surgically ligated. The first three loops are distributed equally in the small intestine and the fourth loop is located in colon. Loops are 1 to 3 centimeters, and are injected with 200µL of either peptide/agonist of the invention (5µg) or vehicle (Krebs Ringer, 10mM glucose, HEPES buffer (KRGH)).

Effect on Diuresis and Natriuresis

The effect of peptides/GC-agonists of the invention on diuresis and natriuresis can be determined using methodology similar to that described in WO06/001931 (examples 6 (p. 42)

and 8 (p.45)). Briefly, the peptide/agonist of the invention (180-pmol) is infused for 60 min into a group of 5 anesthetized rats. Given an estimated rat plasma volume of 10 mL, the infusion rate is approximately 3 pmol/mL/min. Blood pressure, urine production, and sodium excretion are monitored for approximately 40 minutes prior to the infusion, during the infusion, and for approximately 50 minutes after the infusion to measure the effect of the peptide/GC-C agonist on diuresis and natriuresis. For comparison, a control group of five rats is infused with regular saline. Urine and sodium excretion can be assessed. Dose response can also be determined. Peptide/GC-C agonist of the invention is infused intravenously into rats over 60 minutes. Urine is collected at 30 minute intervals up to 180 minutes after termination of peptide/GC-C agonist infusion, and urine volume, sodium excretion, and potassium excretion are determined for each collection interval. Blood pressure is monitored continuously. For each dose a dose-response relationship for urine volume, sodium and potassium excretion can be determined. Plasma concentration of the peptide/GC-agonist is also determined before and after iv infusion.

Administration of peptides and GC-C receptor agonists

For treatment of gastrointestinal disorders, the peptides and agonists of the invention are preferably administered orally, e.g., as a tablet or cachet containing a predetermined amount of the active ingredient, pellet, gel, paste, syrup, bolus, electuary, slurry, sachet; capsule; powder; lyophilized powder; granules; as a solution or a suspension in an aqueous liquid or a non-aqueous liquid; as an oil-in-water liquid emulsion or a water-in-oil liquid emulsion, via a liposomal formulation (see, e.g., EP 736299) or in some other form. Orally administered compositions can include binders, lubricants, inert diluents, lubricating, surface active or dispersing agents, flavoring agents, and humectants. Orally administered formulations such as tablets may optionally be coated or scored and may be formulated so as to provide sustained, delayed or controlled release of the active ingredient therein. The peptides and agonists can be co-administered with other agents used to treat gastrointestinal disorders including but not limited to the agents described herein. The peptides and agonists can also be administered by rectal suppository. For the treatment of disorders outside the gastrointestinal tract such as congestive heart failure and benign prostatic hypertrophy, peptides and agonists are preferably administered parenterally or orally.

The peptides described herein can be administered alone or in combination with other agents. For example, the peptides can be administered together with an analgesic peptide or compound. The analgesic peptide or compound can be covalently attached to a peptide described herein or it can be a separate agent that is administered together with or sequentially with a peptide described herein in a combination therapy.

Combination therapy can be achieved by administering two or more agents, e.g., a peptide described herein and an analgesic peptide or compound, each of which is formulated and administered separately, or by administering two or more agents in a single formulation. Other combinations are also encompassed by combination therapy. For example, two agents can be formulated together and administered in conjunction with a separate formulation containing a third agent. While the two or more agents in the combination therapy can be administered simultaneously, they need not be. For example, administration of a first agent (or combination of agents) can precede administration of a second agent (or combination of agents) by minutes,

hours, days, or weeks. Thus, the two or more agents can be administered within minutes of each other or within 1, 2, 3, 6, 9, 12, 15, 18, or 24 hours of each other or within 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14 days of each other or within 2, 3, 4, 5, 6, 7, 8, 9, or 10 weeks of each other. In some cases even longer intervals are possible. While in many cases it is desirable that the two or more agents used in a combination therapy be present in within the patient's body at the same time, this need not be so.

Combination therapy can also include two or more administrations of one or more of the agents used in the combination. For example, if agent X and agent Y are used in a combination, one could administer them sequentially in any combination one or more times, e.g., in the order X-Y-X, X-X-Y, Y-X-Y, Y-Y-X, X-X-Y-Y, etc.

Combination therapy can also include the administration of two or more agents via different routes or locations. For example, (a) one agent is administered orally and another agents is administered intravenously or (b) one agent is administered orally and another is administered locally. In each case, the agents can either simultaneously or sequentially. Approximated dosages for some of the combination therapy agents described herein are found in the "BNF Recommended Dose" column of tables on pages 11-17 of WO01/76632 (the data in the tables being attributed to the March 2000 British National Formulary) and can also be found in other standard formularies and other drug prescribing directories. For some drugs, the customary presecribed dose for an indication will vary somewhat from country to country.

The agents, alone or in combination, can be combined with any pharmaceutically acceptable carrier or medium. Thus, they can be combined with materials that do not produce an adverse, allergic or otherwise unwanted reaction when administered to a patient. The carriers or mediums used can include solvents, dispersants, coatings, absorption promoting agents, controlled release agents, and one or more inert excipients (which include starches, polyols, granulating agents, microcrystalline cellulose (e.g. celphere, Celphere beads®), diluents, lubricants, binders, disintegrating agents, and the like), etc. If desired, tablet dosages of the disclosed compositions may be coated by standard aqueous or nonaqueous techniques.

Compositions of the present invention may also optionally include other therapeutic ingredients, anti-caking agents, preservatives, sweetening agents, colorants, flavors, desiccants, plasticizers, dyes, glidants, anti-adherents, anti-static agents, surfactants (wetting agents), anti-oxidants, film-coating agents, and the like. Any such optional ingredient must be compatible with the compound of the invention to insure the stability of the formulation.
The composition may contain other additives as needed, including for exanple lactose, glucose, fructose, galactose, trehalose, sucrose, maltose, raffinose, maltitol, melezitose, stachyose, lactitol, palatinite, starch, xylitol, mannitol, myoinositol, and the like, and hydrates thereof, and amino acids, for example alanine, glycine and betaine, and peptides and proteins, for example albumen.

Examples of excipients for use as the pharmaceutically acceptable carriers and the pharmaceutically acceptable inert carriers and the aforementioned additional ingredients include, but are not limited to binders, fillers, disintegrants, lubricants, anti-microbial agents, and coating agents such as:

BINDERS: corn starch, potato starch, other starches, gelatin, natural and synthetic gums such as acacia, xanthan, sodium alginate, alginic acid, other alginates, powdered tragacanth, guar gum, cellulose and its derivatives (*e.g.*, ethyl cellulose, cellulose acetate, carboxymethyl cellulose calcium, sodium carboxymethyl cellulose), polyvinyl pyrrolidone (*e.g.*, povidone, crospovidone, copovidone, etc), methyl cellulose, Methocel, pre-gelatinized starch (*e.g.*, STARCH 1500® and STARCH 1500 LM®, sold by Colorcon, Ltd.), hydroxypropyl methyl cellulose, microcrystalline cellulose (*e.g.* AVICEL™, such as, AVICEL-PH-101™, -103™ and -105™, sold by FMC Corporation, Marcus Hook, PA, USA), or mixtures thereof,

FILLERS: talc, calcium carbonate (*e.g.*, granules or powder), dibasic calcium phosphate, tribasic calcium phosphate, calcium sulfate (*e.g.*, granules or powder), microcrystalline cellulose, powdered cellulose, dextrates, kaolin, mannitol, silicic acid, sorbitol, starch, pre-gelatinized starch, dextrose, fructose, honey, lactose anhydrate, lactose monohydrate, lactose and aspartame,

lactose and cellulose, lactose and microcrystalline cellulose, maltodextrin, maltose, mannitol, microcrystalline cellulose & guar gum, molasses, sucrose,or mixtures thereof,

DISINTEGRANTS: agar-agar, alginic acid, calcium carbonate, microcrystalline cellulose, croscarmellose sodium, crospovidone, polacrilin potassium, sodium starch glycolate, potato or tapioca starch, other starches, pre-gelatinized starch, clays, other algins, other celluloses, gums (like gellan), low-substituted hydroxypropyl cellulose, or mixtures thereof,

LUBRICANTS: calcium stearate, magnesium stearate, mineral oil, light mineral oil, glycerin, sorbitol, mannitol, polyethylene glycol, other glycols, stearic acid, sodium lauryl sulfate, sodium stearyl fumarate, vegetable based fatty acids lubricant, talc, hydrogenated vegetable oil (*e.g.*, peanut oil, cottonseed oil, sunflower oil, sesame oil, olive oil, corn oil and soybean oil), zinc stearate, ethyl oleate, ethyl laurate, agar, syloid silica gel (AEROSIL 200, W.R. Grace Co., Baltimore, MD USA), a coagulated aerosol of synthetic silica (Deaussa Co., Plano, TX USA), a pyrogenic silicon dioxide (CAB-O-SIL, Cabot Co., Boston, MA USA), or mixtures thereof,

ANTI-CAKING AGENTS: calcium silicate, magnesium silicate, silicon dioxide, colloidal silicon dioxide, talc, or mixtures thereof,

ANTIMICROBIAL AGENTS: benzalkonium chloride, benzethonium chloride, benzoic acid, benzyl alcohol, butyl paraben, cetylpyridinium chloride, cresol, chlorobutanol, dehydroacetic acid, ethylparaben, methylparaben, phenol, phenylethyl alcohol, phenoxyethanol, phenylmercuric acetate, phenylmercuric nitrate, potassium sorbate, propylparaben, sodium benzoate, sodium dehydroacetate, sodium propionate, sorbic acid, thimersol, thymo, or mixtures thereof, and

COATING AGENTS: sodium carboxymethyl cellulose, cellulose acetate phthalate, ethylcellulose, gelatin, pharmaceutical glaze, hydroxypropyl cellulose, hydroxypropyl methylcellulose (hypromellose), hydroxypropyl methyl cellulose phthalate, methylcellulose, polyethylene glycol, polyvinyl acetate phthalate, shellac, sucrose, titanium dioxide, carnauba

wax, microcrystalline wax, gellan gum, maltodextrin, methacrylates, microcrystalline cellulose and carrageenan or mixtures thereof.

The formulation can also include other excipients and categories thereof including but not limited to L-histidine, Pluronic®, Poloxamers (such as Lutrol® and Poloxamer 188), ascorbic acid, glutathione, permeability enhancers (e.g. lipids, sodium cholate, acylcarnitine, salicylates, mixed bile salts, fatty acid micelles, chelators, fatty acid, surfactants, medium chain glycerides), protease inhibitors (e.g. soybean trypsin inhibitor, organic acids), pH lowering agents and absorption enhancers effective to promote bioavailability (including but not limited to those described in US6086918 and US5912014), creams and lotions (like maltodextrin and carrageenans); materials for chewable tablets (like dextrose, fructose, lactose monohydrate, lactose and aspartame, lactose and cellulose, maltodextrin, maltose, mannitol, microcrystalline cellulose and guar gum, sorbitol crystalline); parenterals (like mannitol and povidone); plasticizers (like dibutyl sebacate, plasticizers for coatings, polyvinylacetate phthalate); powder lubricants (like glyceryl behenate); soft gelatin capsules (like sorbitol special solution); spheres for coating (like sugar spheres); spheronization agents (like glyceryl behenate and microcrystalline cellulose); suspending/gelling agents (like carrageenan, gellan gum, mannitol, microcrystalline cellulose, povidone, sodium starch glycolate, xanthan gum); sweeteners (like aspartame, aspartame and lactose, dextrose, fructose, honey, maltodextrin, maltose, mannitol, molasses, sorbitol crystalline, sorbitol special solution, sucrose); wet granulation agents (like calcium carbonate, lactose anhydrous, lactose monohydrate, maltodextrin, mannitol, microcrystalline cellulose, povidone, starch), caramel, carboxymethylcellulose sodium, cherry cream flavor and cherry flavor, citric acid anhydrous, citric acid, confectioner's sugar, D&C Red No. 33, D&C Yellow #10 Aluminum Lake, disodium edetate, ethyl alcohol 15%, FD& C Yellow No. 6 aluminum lake, FD&C Blue #1 Aluminum Lake, FD&C Blue No. 1, FD&C blue no. 2 aluminum lake, FD&C Green No.3, FD&C Red No. 40, FD&C Yellow No. 6 Aluminum Lake, FD&C Yellow No. 6, FD&C Yellow No.10, glycerol palmitostearate, glyceryl monostearate, indigo carmine, lecithin, manitol, methyl and propyl parabens, mono ammonium glycyrrhizinate, natural and artificial orange flavor, pharmaceutical glaze, poloxamer 188, Polydextrose, polysorbate 20, polysorbate 80, polyvidone, pregelatinized corn starch,