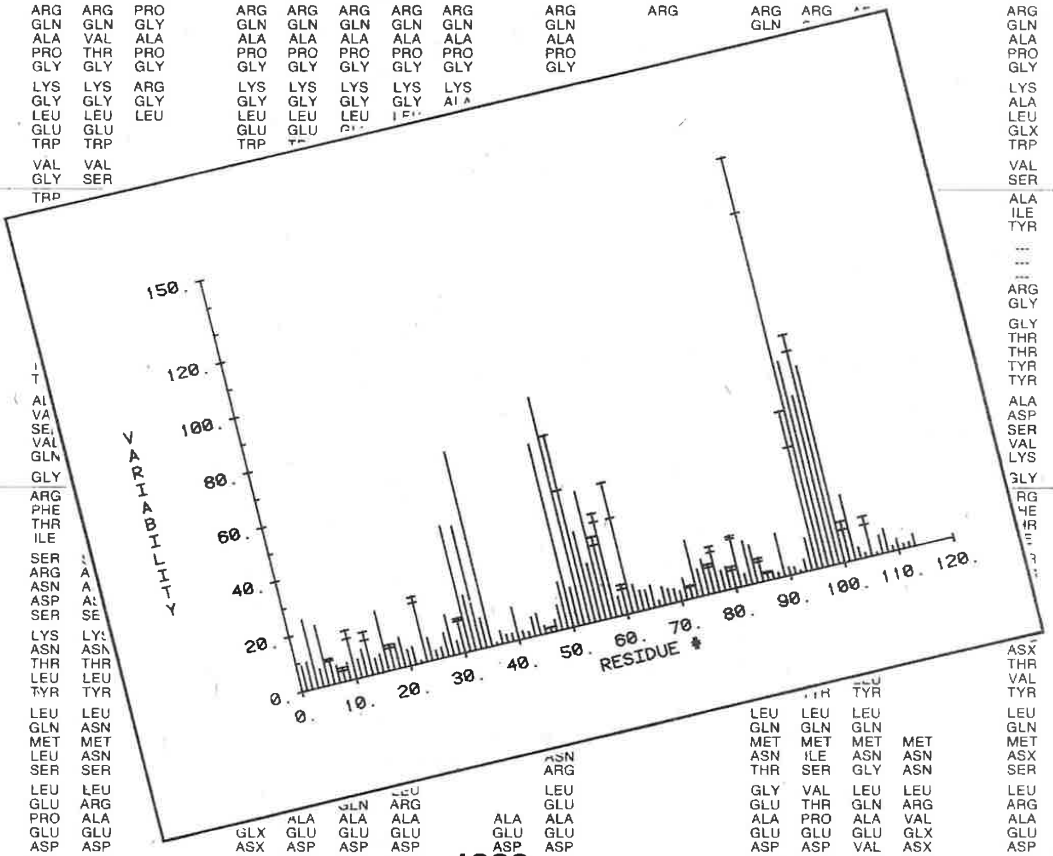
SEQUENCES OF PROTEINS OF IMMUNOLOGICAL INTEREST



1983

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

SEQUENCES OF PROTEINS OF IMMUNOLOGICAL INTEREST

Elvin A. Kabat, Tai Te Wu, Howard Bilofsky,
Margaret Reid-Miller, and Harold Perry

(1983)

Errata

Page; #

6; 20 Position -1 of 145'CL (precursor heavy chains) should be Phe.

15; 31 35 Pau and Paul are the same protein.

54; 204 205 The antibody specificities for 10K44-7A1 and 10K26-12A1 (mouse kappa light chains) should by anti-p-azobenzene arsonate.

65; 13 16 SAPC178 and SAPC176 (mouse lambda light chains) should be named as S178 and S176.

65; 4 5 6 16 17 References for HOPC1, J698, H2061, S176, and H2020 (mouse lambda light chains) should be Weigert, M., Cesari, I.M., Yonkovich, S.J. & Cohn, M. (1970) Nature, 228, 1045-1047.

65; 7 12 References for W3159 and MOPC511 (mouse lambda light chains) should be Cesari, I.M. & Weigert, M. (1973) Proc. Natl. Acad. Sci. U.S.A., 70, 2112-2116.

65; 2 3 13 J558, XS104, and S178 (mouse lambda light chains) were sequenced completely, while HOPC1, J698, H2061, S176, H2020, W3159, and MOPC511 (mouse lambda light chains) were analyzed by amino acid sequence compositions.

66; 26 27 There is an additional reference to TEPC952 and MA8-13 (mouse lambda light chains) i.e., Elliott, B.W., Jr., Steiner, L.A. & Eisen, H.N. (1981) Fed. Proc., 40, 1098.

67; The statement in the notes of mouse lambda light chains, "The order of the genes has been determined as V1-J3-C3-J1-C1-V2-J2-C2-J4-C4," should be replaced by "There are two linkage groups: J3-C3-J1-C1 and J2-C2-J4-C4."

111; 23 Positions 13 and 14 of CAM (human heavy chain subgroup III) should be Gln and Lys respectively.

168; 30 Position 171 of S43'CL (light constant chain) should be Asn.

168; 35 Positions 142 and 143 of MOPC315 (light constant chain) should be Ser and Gly respectively, based on the translation from nucleotide sequences (Bothwell, A.L.M., Paskind, M., Roth, M., Imanishi-Kari, T., Rajewsky, K. & Baltimore, D. (1982) Nature, 298, 380-382; Wu, G.E., Govindi, N., Hozumi, N. & Murialdo, H. (1982) Nucl. Acids Res., 10, 3831-3843).

185; 52 Positions 258 and 263 of MOPC173 (heavy constant chain) have been revised by the authors to Pro and Val respectively.

246; The position numbering for the codons of light chain variable region should read as 95, 95A, 95B, 95C, 95D, 95E, 95F, 96, and 97.

The human kappa J-segments (Hieter, P.A., Maizel, J.V., Jr. & Leder, P. (1982) J. Biol. Chem., 257, 1516-1522) are as follows:

	J1		J2		J3		J4		J5	
96	TGG	TRP	TAC	TYR	TTC	PHE	CTC	LEU	ATC	ILE
97	ACG	THR	ACT	THR	ACT	THR	ACT	THR	ACC	THR
98	TTC	PHE	TTT	PHE	TTC	PHE	TTC	PHE	TTC	PHE
99	GGC	GLY	GGC	GLY	GGC	GLY	GGC	GLY	GGC	GLY
100	GAA	GLN	CAG	GLN	CCT	PRO	GGA	GLY	CAA	GLN
101	GGG	GLY	GGG	GLY	GGG	GLY	GGG	GLY	GGG	GLY
102	ACC	THR	ACC	THR	ACC	THR	ACC	THR	ACA	THR
103	AAG	LYS	AAG	LYS	AAA	LYS	AAG	LYS	CGA	ARG
104	GTG	VAL	CTG	LEU	GTG	VAL	GTG	VAL	CTG	LEU
105	GAA	GLU	GAG	GLU	GAT	ASP	GAG	GLU	GAG	GLU
106	ATC	ILE	ATC	ILE	ATC	ILE	ATC	ILE	ATT	ILE
107	AAA	LYS	AAA	LYS	AAA	LYS	AAA	LYS	AAA	LYS
108	CGT	ARG	CGT	ARG	CGT	ARG	CGT	ARG	CGT	ARG

SEQUENCES OF PROTEINS OF IMMUNOLOGICAL INTEREST

Tabulation and Analysis of
Amino Acid and Nucleic Acid Sequences of
Precursors, V-Regions, C-Regions, J-Chain,
β_2-Microglobulins, Major Histocompatibility Antigens,
Thy-1, Complement, C-Reactive Protein, Thymopoietin,
Post-gamma Globulin, and α_2-Macroglobulin

1983

*Elvin A. Kabat**, *Tai Te Wu*†, *Howard Bilofsky*‡,
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‡ Bolt Beranek and Newman Inc., Cambridge, MA 02238

The collection and maintenance of this data base is sponsored through Contract N01-RR-8-2118 by the following components of the National Institutes of Health, Bethesda, MD 20205:

Division of Research Resources
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National Institute of Allergy and Infectious Diseases
National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases
National Institute of General Medical Sciences

U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES
Public Health Service
National Institutes of Health

Our listing of sequences will be kept up to date. Investigators are invited to send additional sequence data when accepted for publication. Send two copies of the manuscript together with a letter of acceptance from a journal to:

Dr. E.A. Kabat
National Institutes of Health
Building 4, Room 337
9000 Rockville Pike
Bethesda, Maryland 20205

If a computer tape is available, please send it to facilitate entering sequences.

When published, three reprints should be provided.

If any published sequences have been overlooked or if any errors are found, please bring them to our attention.

CODONS OF VARIABLE REGION LIGHT CHAINS

		1 HK101	2 HK102	3 MOPC 41	4 MOPC 21	5 MOPC 167	6 MOPC 149 (K2)	7 K2A	8 MPC 11	9 MOPC 173B	10 S107 B	11 T1	12 L6	13 T2	14 L7	15 PKAPPA (11)24	16 IG99 LAMBDA	17 IG13 LAMBDA	18 IG303 LAMBDA	19 S43	20 MOPC 315	21 PLAI -13
	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	GGA	---	---	---	---	---	
	1	GAC	GAC	GAC	AAC	GAT	GAC	GAC	GAC	GAC	GAA	GAC	GAC	GAC	GAC	GAC	CAG	CAG	CAG	CAG	CAG	
	2	ATC	ATC	ATC	ATT	ATT	ATC	ATC	ATT	ATC	AAT	ATC	ATC	ATC	ATC	ATT	GCT	GCT	GCT	GCT	GCT	
	3	CAG	CAG	CAG	GTA	GTG	CAG	CAG	GTG	CAG	GTG	AAG	AAG	TTG	TTG	GTG	GTT	GTT	GTT	GTT	GTT	
	4	ATG	ATG	ATG	ATG	ATA	ATG	ATG	CTG	ATG	CTC	ATG	ATG	CTG	CTG	ATG	GTG	GTG	GTG	GTG	GTG	
	5	ACC	ACC	ACC	ACC	ACC	ACT	ACT	ACC	ACC	ACC	ACC	ACC	ACT	ACT	ACC	ACT	ACT	ACT	ACT	ACT	
	6	CAG	CAG	CAG	CAA	CAG	CAG	CAG	CAA	CAG	CAG	CAG	CAG	CAG	CAG	CAG	CAG	CAG	CAG	CAG	CAG	
	7	TCT	TCT	TCT	TCT	GAT	TCT	TCT	TCT	TCT	TCT	TCT	TCT	TCT	TCT	TCT	GAA	GAA	GAA	GAA	GAA	
	8	CCA	CCT	CCA	CCC	GAA	CCA	CCA	CCG	CCA	CCA	CCA	CCA	CCA	CCA	ACC	TCT	TCT	TCT	TCT	TCT	TCT
	9	TCC	TCC	TCC	AAA	CTC	GCC	GCC	GCT	TCC	GCA	TCT	TCT	GCC	GCC	AAA	GCA	GCA	GCA	GCA	GCA	GCA
FR1	10	TCA	ACC	TCC	TCC	TCC	TCC	TCC	TCT	TCC	ATA	TCC	TCC	ATC	ATC	TTC	---	---	---	---	---	---
	11	CTG	CTG	TTA	ATG	AAT	CTA	CTA	TTG	TTA	ATG	ATG	ATG	CTG	CTG	ATG	CTC	CTC	CTC	CTC	CTC	CTC
	12	TCT	TCT	TCT	TCG	CCT	TCT	TCT	GCT	TCT	GCT	TAT	TAT	TCT	TCT	TCC	ACC	ACC	ACC	ACC	ACC	ACC
	13	GCA	GCA	GCC	ATG	GTC	GCA	GCA	GTG	GCT	GCC	GCA	GCA	GTG	GTG	ACA	ACA	ACA	ACA	ACA	ACA	ACA
	14	TCT	TCT	TCT	TCA	ACT	TCT	TCT	TCT	TCT	TCT	TCT	TCT	AGT	AGT	TCA	TCA	TCA	TCA	TCA	TCA	TCA
	15	GTA	GTA	CTG	GTA	TCT	GTG	GTG	CTA	CTG	CTG	CTA	CTA	CCA	CCA	GTA	CCT	CCT	CCT	CCT	CCT	CCT
	16	GGA	GGA	GGA	GGA	GGA	GGT	GGT	GGG	GGA	GGG	GGA	GGA	GGA	GGA	GGA	GGT	GGT	GGT	GGT	GGT	GGT
	17	GAC	GAC	GAA	GAG	GAA	GAA	GAA	CAG	GAA	CAG	GAG	GAG	GAA	GAA	GAC	GAA	GGA	GAA	GAA	GGA	GAA
	18	AGA	AGA	AGA	AGG	TAC	ACT	ACT	AGG	AGA	AAG	AGA	AGA	AGA	AGA	AGG	ACA	ACA	ACA	ACA	ACA	ACA
	19	GTC	GTC	GTC	GTC	GTT	GTC	GTC	GCC	GTC	GTC	GTC	GTC	GTC	GTC	GTC	GTC	GTC	GTC	GTC	GTC	GTC
	20	ACC	ACC	AGT	ACC	TCC	ACC	ACC	ACC	AGT	ACC	ACT	ACT	AGT	AGT	AGC	ACA	ATA	ACA	ACA	ATA	ACA
	21	ATC	ATC	CTC	TTG	ATC	ATC	ATC	ATA	CTC	ATG	ATC	ATC	TTC	TTC	ATC	CTC	CTC	CTC	CTC	CTC	CTC
	22	ACT	ACT	ACT	ACC	TCG	ACA	ACA	TCC	ACT	ACC	TCT	ACT	TCC	TCC	ACC	ACT	ACT	ACT	ACT	ACT	ACT
	23	TGT	TGC	TGT	TGC	TGC	TGT	TGT	TGC	TGC	TGC	TGC	TGC	TGC	TGC	TGC	TGT	TGT	TGT	TGT	TGT	TGT
	24	CGG	CGG	CGG	AAG		CGA	CGA	AGA	CGG	AGT	AAG	AAG	AGG	AGG	AAG	CGC	CGC	CGC	CGC	CGC	CGC
	25	GCG	GCC	GCA	GCC		GCA	GCA	GCC	GCA	GCC	GCG	GCG	GCC	GCC	GCC	TCA	TCA	TCA	TCA	TCA	TCA
	26	AGG	AGT	AGT	AGT		AGT	AGT	AGT	AGT	AGC	AGT	AGT	AGT	AGT	AGT	AGT	AGT	ACT	AGT	AGT	AGT
	27	CAG	CAG	CAG	GAG		GGG	GGG	GAA	CAG	TCA	CAG	CAG	CAG	CAG	CAG	ACT	ACT	ACT	ACT	ACT	ACT
	27A	---	---	---	---		---	---	AGT	---	---	---	---	---	---	---	---	---	---	---	---	---
	27B	---	---	---	---		---	---	GTT	---	---	---	---	---	---	---	---	---	---	---	---	---
CDR1	27C	---	---	---	---		---	---	GAT	---	---	---	---	---	---	---	---	---	---	---	---	---
	27D	---	---	---	---		---	---	AGT	---	---	---	---	---	---	---	GGG	GGG	GGG	GGG	GGG	---
	27E	---	---	---	---		---	---	---	---	---	---	---	---	---	---	GCT	GCT	GCT	GCT	GCT	GCT
	27F	---	---	---	---		---	---	---	---	---	---	---	---	---	---	GTT	GTT	GTT	GTT	GTT	GTT
	28	GGT	AGT	GAC	AAT		AAT	AAT	TAT	GAC	AGT	GAC	GAC	AGC	AGC	GAT	ACA	ACA	ACA	ACA	ACA	ACA
	29	ATT	ATT	ATT	GTG		ATT	ATT	GGC	ATT	GTA	ATT	ATT	ATT	ATT	GTG	ACT	ACT	ACT	ACT	ACT	ACT
	30	AGC	AGT	GGT	GTT		CAC	CAC	AAT	CAT	AGT	AAT	AAT	GGC	GGC	AGT	AGT	AGT	GGT	AGT	AGT	---
	31	AGC	AGC	AGT	ACT		AAT	AAT	AGT	GGT	TCC	AGC	AGC	ACA	ACA	ACT	AAC	AAC	AAC	AAC	AAC	---
	32	TGG	TGG	AGC	TAT		TAT	TAT	TTT	TAT	AGT	TAT	TAT	AGC	AGC	ACT	TAT	TAT	TAT	TAT	TAT	---
	33	TTA	TTG	TTA	GTT		TTA	TTA	ATG	TTA	TAC	TTA	TTA	ATA	ATA	GTG	GCC	GCC	GCC	GCC	GCC	---
	34	GCC	GCC	AAC	TC		GCA	GCA	CAC	AAC	TTG	ACC	AGC	CAC	CAC	GCC	AAC	AAC	AAC	AAC	AAC	---
	35	TGG	TGG	TGG	TGG		TGG	TGG	TGG	TTG	CAC	TGG	TGG	TGG	TGG	TGG	TGG	TGG	TGG	TGG	TGG	---
	36	TAT	TAT	CTT	TAT		TAT	TAT	TAC	TTT	TGG	TTC	TTC	TAT	TAT	TAT	GTC	GTT	GTC	GTC	ATC	---
	37	CAG	CAG	CAG	CAA		CAG	CAG	CAG	CAG	TAC	CAG	CAG	CAG	CAG	CAG	CAA	CAA	CAA	CAA	CAA	---
	38	CAG	CAG	CAG	CAG		CAG	CAG	CAG	CAG	CAG	CAG	CAG	CAA	CAA	CAG	GAA	GAA	GAA	GAA	GAA	---
	39	AAA	AAA	GAA	AAA		AAA	AAA	AAA	AAA	CAG	AAA	AAA	AGA	AGA	AAA	AAA	AAA	AAA	AAA	AAA	---
	40	CCA	CCA	CCA	CCA		CAG	CAG	CCA	CCA	AAG	CCA	CCA	ACA	ACA	CCA	CCA	CCA	CCA	CCA	CCA	---
FR2	41	GAG	GGG	GAT	GAG		GGA	GGA	GGA	GGT	TCA	GGG	GGG	AAT	AAT	GGG	GAT	GAT	GAT	GAT	GAT	---
	42	AAA	AAA	GGA	CAA		AAA	AAA	CAG	GAA	GGC	AAG	AAA	GGT	GGT	CAA	CAT	CAT	CAT	CAT	CAT	---
	43	GCC	GCC	ACT	TCT		TCT	TCT	CCA	ACT	GCT	TCT	TCT	TCT	TCT	TCT	TTA	TTA	TTA	TTA	TTA	---
	44	CCT	CCT	ATT	CCT		CCT	CCT	CCC	ATT	TCC	CCT	CCT	CCA	CCA	CCT	TTC	TTC	TTC	TTC	TTC	---
	45	AAG	AAG	AAA	AAA		CAG	CAG	AAA	AAA	CCC	AAG	AAG	AGG	AGG	AAA	ACT	ACT	ACT	ACT	ACT	---
	46	TCC	CTC	CGC	CTC		CTC	CTC	CTC	CAC	AAA	ACC	ACC	CTT	CTT	CTA	GGT	GGT	GGT	GGT	GGT	---
	47	CTG	CTG	CTG	TTA		CTG	CTG	CTC	CTG	CCC	CTG	CTG	CTC	CTC	CTG	CTA	CTA	CTA	CTA	CTA	---
	48	ATC	ATC	ATC	ATT		GTC	GTC	ATC	ATC	TTG	CTC	ATC	ATA	ATA	ATT	ATA	ATA	ATA	ATA	ATC	---
	49	TAT	TAT	TAC	TAC		TAT	TAT	TAT	TAT	ATT	TAT	TAT	AAG	AAG	TAT	GGT	GGT	GGT	GGT	GGT	---
	50	GCT	GAT	GCC	GGG		AAT	AAT	CGT	GAA	CAT	CGT	CGT	AAT	TAT	TCG	GGT	GGT	GGT	GGT	GGT	---
	51	GCA	GCC	ACA	GCC		GCA	GCA	GCA	ACA	AGG	GCA	GCA	GCT	GCT	GCA	ACC	ACC	ACC	ACC	ACC	---
CDR2	52	TCC	TCC	TCC	TCC		AAA	AAA	TCC	TCC	ACA	AAC	AAC	TCT	TCT	TCC	AAC	AAC	AAC	AAC	AGC	---
	53	AGT	AGT	AGT	AAC		ACC	ACC	AAC	AAT	TCC	AGA	AGA	GAG	GAG	TAC	AAC	AAC	AAC	AAC	AAC	---
	54	TTG	TTG	TTA	CGG		TTA	TTA	CTA	TTA	AAC	TTG	TTG	TCC	TCT	CGG	CGA	CGA	CGA	CGA	CGA	---
	55	CAA	GAA	GAT	TAC		GCA	GCA	GAA	GAT	CTG	GTA	GTA	ATC	ATC	TAC	GCT	GCT	GCT	GCT	GCT	---
	56	AGT	AGT	TCT	ACT		GAT	GAT	TCT	TCT	GCT	GAT	GAT	TCT	TCT	ACT	CCA	CCA	.CCA	CCA	CCA	---
	57	GGG	GGG	GGT	GGG		GGT	GGT	GGG	GGT	TCT	GGG	GGG	GGG	GGG	GGA	GGT	GGT	GGT	GGT	GGT	---
	58	GTC	GTC	GTC	GTC		GTG	GTG	ATC	GTC	GGA	GTC	GTC	ATC	ATC	GTC	GTT	GTT	GTT	GTT	GTT	---
	59	CCA	CCA	CCC	CCC		CCA	CCA	CCT	CCA	GTC	CCA	CCA	CCT	CCT	CCC	CCT	CCT	CCT	CCT	CCT	---
	60	TCA	TCA	AAA	GAT		TCA	TCA	GCC	AAA	CCA	TCA	TCA	TCC	TCC	GAT	GCC	GTC	GCC	GCC	GTC	---
	61	AGG	AGG	AGG	CGC		AGG	AGG	AGG	AGG	GCT	AGG	AGG	AGG	AGG	CGC	AGA	AGA	AGA	AGA	AGA	---
	62	TTC	TTC	TTC	TTC		TTC	TTC	TTC	TTC	CGC	TTC	TTC	TTT	TTT	TTC	TTC	TTC	TTC	TTC	TTC	---
	63	AGC	AGC	AGT	ACA		AGT	AGT	AGT	AGT	TTC	AGT	AGT	AGT	AGT	AC	TCA	TCA	TCA	TCA	TCA	---
	64	GGC	GGC	GGC	GGT		GGC	GGC	GGC	GGC	AGT	GGC	GGC	GGC	GGC	GGC	GGC	GGC	GGC	GGC	GGC	---
	65	AGT	AGT	AGT	AGT		AGT	AGT	AGT	AGT	GGC	AGT	AGT	AGT	AGT	AGT	TCC	TCC	TCC	TCC	TCC	---
	66	GGA	GGA	AGG	GGA		GGA	GGA	GGG	AGG	AGT	GGA	GGA	GGA	GGA	GGA	CTG	CTG	CTG	CTG	CTG	---
	67	TCT	TCT	TCT	TCT		TCA	TCA	TCT	TCT	GGG	TCT	TCT	TCA	TCA	TCT	ATT	ATT	ATT	ATT	ATT	---
	68	GGG	GGG	GGG	GCA		GGA	GGA	AGG	GGG	TCT	GGG	GGG	GGG	GGG	GGG	GGA	GGA	GGA	GGA	GGA	---
	69	ACA	ACA	TCA	ACA		ACA	ACA	ACA	TCA	GGG	CAA	CAA	ACA	ACA	ACG	GAC	GAC	GAC	GAC	GAC	---
	70	GAT	GAA	GAT	GAT		CAA	CAA		GAT	ACC	GAT	GAT	GAT	GAT	GAT	AAG	AAG	AAG	AAG	AAG	---
FR3	71	TTC	TTC	TAT	TTC		TAT	TAT		TAT	TCT	TTT	TAT	TTT	TTT	TTC	GCT	GCT	GCT	GCT	GCT	---
	72	ACT	ACT	TCT	ACT		TCT	TCT		TCT	TAC	TCT	TCT	ACT	ACT	ACT	GCC	GCC	GCC	GCC	GCC	---
	73	CTC	CTC	CTC	CTG		CTC	CTC	CTC	CTC	TCT	CTC	CTC	CCT	CTT	TTC	CTC	CTC	CTC	CTC	CTC	---
	74	ACC	ACC	ACC	ACC		AAG	AAG	ACC	ATT	CTC	ACC	ACC	AGC	AGC	ACC	ACC	ACC	ACC	ACC	ACC	---
	75	ATC	ATC	ATC	ATT		ATC	ATC	ATT	ATC	ACA	ATC	ATC	ATC	ATC	ATC	ATC	ATC	ATC	ATC	ATC	---
	76	AGC	AGC	AGC	AGT		AAC	AAC	AAT	GGC	ATC	AGC	AGC	AAC	AAC	AGC	ACA	ACA	ACA	ACA	ACA	---
	77	AGC	AGC	AGC	AGT		AGC	AGC	CCT	AGC	AGC	AGC	AGC	AGT	AGT	AGT	GGG	GGG	GGG	GGG	GGG	---
	78	CTG	CTG	CTT	GTG		CTG	CTG	GTG	CTT	AGC	CTG	CTG	GTG	GTG	GTG	GCA	GCA	GCA	ACA	GCA	---
	79	CAG	CAG	GAG	CAA		CAG	CAG	GAG	GAG	GTG	GAG	GAG	GAG	GAG	CAG	CAG	CAG	CAG	CAG	CAG	---
	80	CCT	CCT	TCT	GCT		CCT	CCT	GCT	TCT	GAG	TAT	TAT	TCT	TCT	GCT	ACT	ACT	ACT	ACT	ACT	---
	81	GAA	GAT	GAA	GAA		GAA	GAA	GAT	GAA	GCT	GAA	GAA	GAA	GAA	GAA	GAG	GAG	GAG	GAG	GAG	---
	82	GAT	GAT	GAT	GAC		GAT	GAT	GAT	GAT	GAA	GAT	GAT	GAT	GAT	GAC	GAT	GAT	GAT	GAT	GAT	---
	83	TTT	TTT	TTT	CTT		TTT	TTT	GTT	TTT	GAT	ATG	ATG	ATT	ATT	CTA	GAG	GAT	GAG	GAG	GAT	---
	84	GCA	GCA	GTA	GCA		GGG	GGG	GCA	GCA	GAT	GGA	GGA	GCA	GCA	GCA	GCA	GCA	GCA	GCA	GCA	---
	85	ACT	ACT	GAC	GAT		AGT	AGT	ACC	GAC	GCA	ATT	ATT	GAA	GAT	GTT	ATA	ATG	ATA	ATG	ATG	---
	86	TAT	TAT	TAT	TAT		TAT	TAT	TAT	TAT	ACT	TAT	TAT	TAT	TAT	TAT	TAT	TAT	TAT	TAT	TAT	---
	87	TAC	TAC	TAC	CAC		TAC	TAC	TAC	TAC	TAT	TAT	TAT	TAC	TAC	TAC	TTC	TTC	TTC	TTC	TTC	---
	88	TGC	TGC	TGT	TGT		TGT	TGT	TGT	TGT	TAC	TGT	TGT	TGT	TGT	TGT	TGT	TGT	TGT	TGT	TGT	---
	89	CAA	CAA	CTA	GGA		CAA	CAA	CAG	CTA	TGC	CTT	CTA	CAA	CAA	CAG	GCT	GCT	GCT	GCT	GCT	---
	90	CAG	CAG	CAA	CAG		CAT	CAT	CAA	CAA	CAG	CAG	CAG	CAA	CAA	CAA	CTA	CTA	CTA	CTA	CTA	---
	91	TAT	TAT	TAT	GGT		TTT	TTT	AGT	TAT	CAG	TAT	TAT	AGT	AGT	CAT	TGG	TGG	TGG	TGG	TGG	---
	92	AAT	AAT	GCT	TAC		TGG	TGG	AAT	GCT	TGG	GAT	GAT	TAT	AAT	TAT	TAC	TAC	TAC	TAC	TTC	---
	93	AGT	AGT	AGT	AGC		AGT	AGT	GAG	AGT	AGT	GAG	GAG	AGG	AGC	AGT	AGC	AGC	AGC	AGC	AGA	---
	94	TAC	TAT	TCT	TAT		ACT	ACT	GAT	TCT	GGT	TTT	TTT	TGG	TGG	ACT	AAC	AAC	AAC	AAC	AAC	---
CDR3	95	CCT	TCT	CCG	CCG		CCT	CCT	CCG	CCT	TAC	CCG	CCG	CCA	CCA	CCT	CAT	CAT	CAT	CAT	CAT	---
	96	---	---	TGG	TAC		---	---	---	---	CCA	CTC	---	---	---	CCC	---	---	TGG	TGG	TTT	---
	97	---	---	ACG	ACG		---	---	---	---	---	ACG	---	---	---	ACG	---	---	GTG	GTG	GTT	---
	97A	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	97B	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	97C	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	97D	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	97E	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	97F	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	98	---	---	TTC	TTC		---	---	---	---	TTC	TTC	---	---	---	TTC	---	---	TTC	TTC	TTC	---
	99	---	---	GGT	GGA		---	---	---	---	GGC	GGT	---	---	---	GGA	---	---	GGT	GGT	GGC	---
	100	---	---	GGA	GGG		---	---	---	---	TCG	GCT	---	---	---	GGG	---	---	GGA	GGA	GGT	---
	101	---	---	GGC	GGG		---	---	---	---	GGG	GGG	---	---	---	GGG	---	---	GGA	GGT	GGA	---
FR4	102	---	---	ACC	ACC		---	---	---	---	ACA	ACC	---	---	---	ACC	---	---	ACC	ACC	ACC	---
	103	---	---	AAG	AAG		---	---	---	---	AAG	AAG	---	---	---	AAG	---	---	AAA	AAA	AAG	---
	104	---	---	CTG	CTG		---	---	---	---	TTG	CTG	---	---	---	CTG	---	---	CTG	GTC	GTC	---
	105	---	---	GAA	GAA		---	---	---	---	GAA	GAG	---	---	---	GAA	---	---	ACT	ACT	ACT	---
	106	---	---	ATC	ATA		---	---	---	---	ATA	CTG	---	---	---	ATA	---	---	GTC	GTC	GTC	---
	106A	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	CTA	CTA	CTA	---
	107	---	---	AAA	AAA		---	---	---	---	AAA	AAA	---	---	---	AAA	---	---	GGT	GGC	GGT	---
	108	---	---	CGT	---		---	---	---	---	CGT	CGT	---	---	---	CGG	---	---	---	---	---	---

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