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(54) **BETULIN, BETULIN DERIVATIVES,  
BETULINIC ACID AND BETULINIC ACID  
DERIVATIVES AS NOVEL THERAPEUTICS  
IN THE TREATMENT OF DISEASE OF LIPID  
AND/OR GLUCOSE METABOLISM**

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(57) **ABSTRACT**

The invention relates to method of modulating lipid metabolism comprising contacting a cell with betulin, a betulin derivative, betulinic acid, a betulinic acid derivative, or a related steroid-like compound. In some aspects, the invention relates to the treatment of disorders of lipid metabolism. The invention further relates to methods of identifying compounds that modulate lipid metabolism. The invention also relates to the use of betulin, a betulin derivative, betulinic acid, a betulinic acid derivative, or a related steroid-like compound for preparation of a medicament for the treatment of a disorder of lipid metabolism.

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**Related U.S. Application Data**

(60) **Provisional application No. 60/669,158, filed on Apr. 7, 2005.**

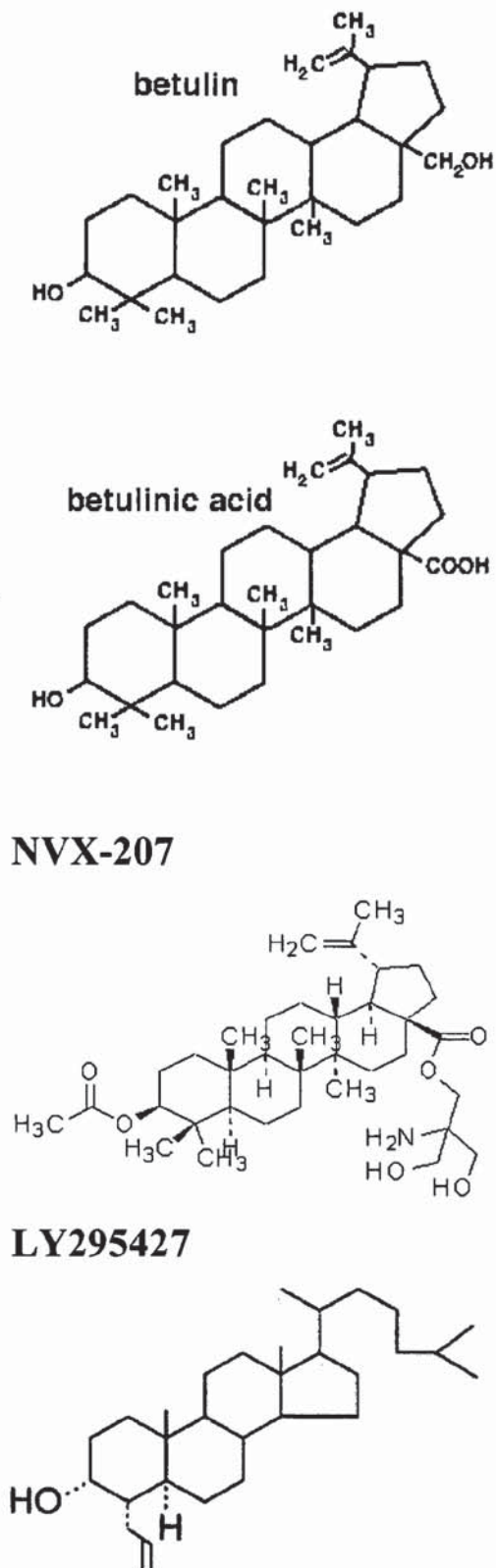


FIG. 1

# NVX-207

## Identification of targets and binding partners

- The primary amine group of NVX-207 allows for coupling of agents with amine-reactive groups
- This feature may be used for the identification of target proteins

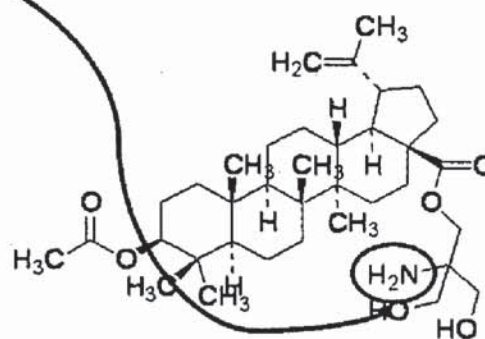


FIG. 2A

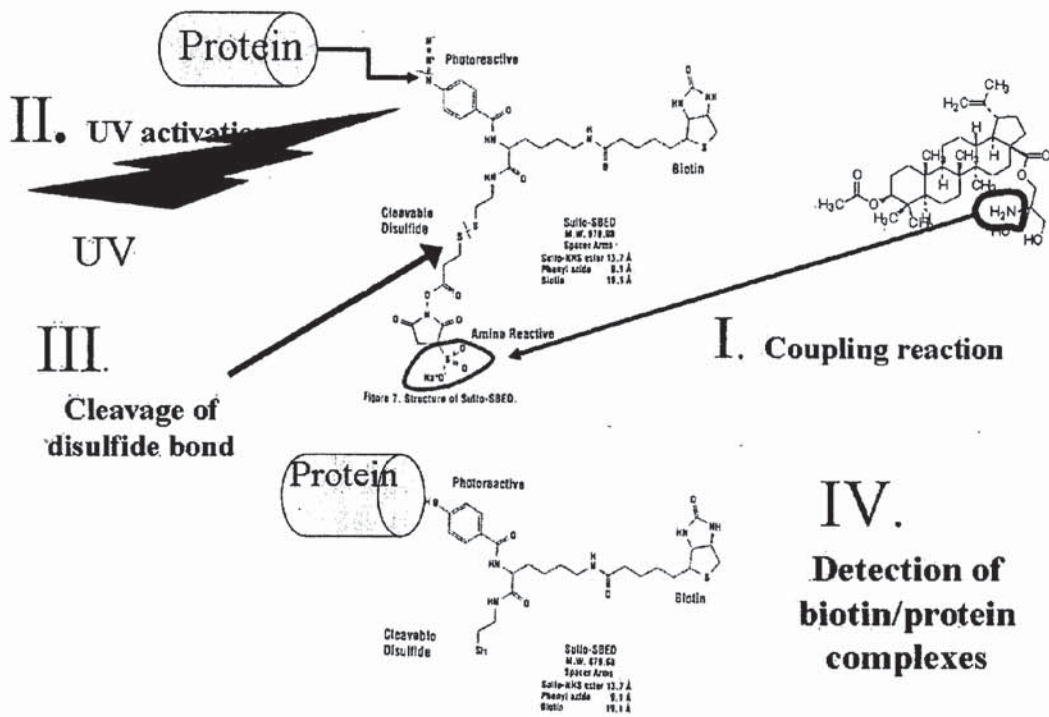


FIG. 2B

**Spot #1:**

1. gi|245563 (mass: 28415, score: 956): apolipoprotein A-I.  
Calculated pI value: 5.57
2. gi|3318722 (mass: 24142, score: 883): Chain E, Leech-Derived Trypsase  
Inhibitor TRYPSIN COMPLEX
3. gi|17318569: (mass: 66198, score: 811):keratin 1 [Homo sapiens]
4. gi|71528 (mass: 59720, score: 528): keratin 10, type I, cytoskeletal - human

**Spot #2:**

1. gi|14318422 (mass: 55120, score: 3678): keratin, hair, basic, 6 [Homo  
sapiens]
2. gi|55645379 (mass: 92681, score: 3639): PREDICTED: similar to Type I  
hair keratin 3A [Pan troglodytes]
3. gi|15431312 (mass: 51770, score: 1710): type I hair keratin 2 [Homo  
sapiens]
4. gi|4504935 (mass: 57306, score 1447): keratin, hair, basic, 5 [Homo  
sapiens]
5. gi|113988 (mass: 30258, score 478): Apolipoprotein A-I precursor (Apo-  
AI) (ApoA-I), Calculated pI value: 5.71

**Spot #3**

1. gi|113988 (mass: 30258, score: 5869): Apolipoprotein A-I precursor (Apo-  
AI) (ApoA-I)
2. gi|181402 (mass: 66110, score: 481): epidermal cytokeratin 2 [Homo  
sapiens]
3. gi|17318569 (mass: 66198, score: 320): keratin 1 [Homo sapiens]
4. gi|71528 (mass: 59720, score: 301): keratin 10, type I, cytoskeletal - human
5. gi|3318722 (mass: 24142, score: 296): Chain E, Leech-Derived Trypsase  
InhibitorTRYPSIN COMPLEX

**FIG. 3A**

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