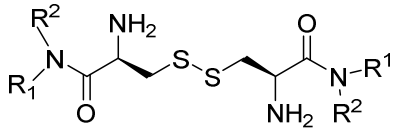
CLAIMS

1. A compound, a pharmaceutically acceptable salt thereof, a solvate thereof, or a prodrug thereof, wherein the compound is represented by Formula I,

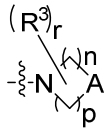

Formula I

Wherein each pair of R^1 and R^2 are independently defined as follows:

a) R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2, 3 or 4; wherein R^a and R^b are each independently a $C_{1\text{-}8}$alkyl, alternatively R^a and R^b together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring, wherein a carbon in the 4 to 8-membered heterocyclic ring is optionally replaced with a heteroatom selected from the group consisting of O, S, NH, and N $C_{1\text{-}8}$alkyl;

or

b) R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1


X-1

wherein

R^3 is $C_{1\text{-}8}$alkyl; r is 0, 1, or 2;

n, p, and A are defined as follows:

i)

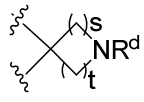
n and p are independently 2 or 3;

A is NR^c, wherein R^c is H, $C_{2\text{-}8}$alkyl or a $C_{3\text{-}8}$ cycloalkyl;

ii)

n is 0, 1, or 2; p is 2 or 3 or 4;

A is a structure of Formula Y-1


Y-1

wherein R^d is H or $C_{1\text{-}8}$alkyl;

s is 0, 1, or 2; t is 2, 3 or 4; provided that when n is 0, s is 1 or 2;

or

iii)

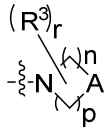
n and p are independently 1, 2, 3 or 4;

A is $CH(CH_2)_qNR^eR^f$, wherein

R^e and R^f are independently C_{1-8}alkyl; q is 0-3;

alternatively, R^e and R^f, together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring.

2. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2 or 3; R^a and R^b are each independently a C_{1-2}alkyl.
3. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2 or 3; wherein R^a and R^b link up to form a 5 to 8-membered heterocyclic ring wherein a carbon in the ring is optionally replaced with O.
4. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 and R^2, together with the amide nitrogen link up to form the ring of formula X-1

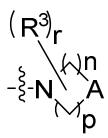


X-1

wherein r is 0, and n and p are independently 2 or 3 or 4;

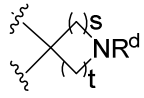
A is NR^c, wherein R^c is hydrogen, C_{2-8}alkyl or C_{3-8} cycloalkyl.

5. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 4, wherein n and p are independently 2, and R^c is selected from the group consisting of tert-butyl, cyclopropyl, cyclobutyl, and cyclopentyl.
6. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1



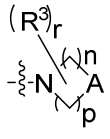
X-1,

wherein r is 0, A is Formula Y-1



Y-1.

7. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 6, wherein n is 0, s is 1 or 2.
8. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 6, wherein n is 1 or 2, s is 0, 1 or 2.
9. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1

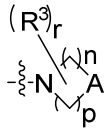


X-1,

r is 0; n and p are independently 1, 2, 3 or 4;

A is $CH(CH_2)_qNR^eR^f$, wherein R^e and R^f are independently $C_{1\text{-}8}$alkyl; q is 0-3.

10. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1

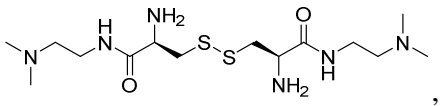
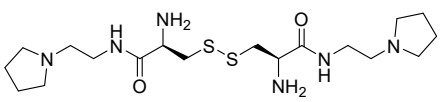
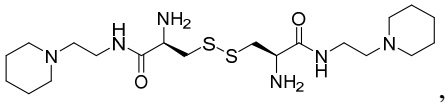
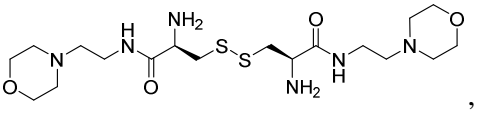


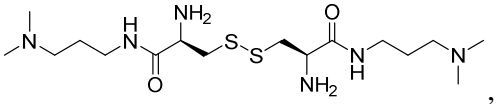
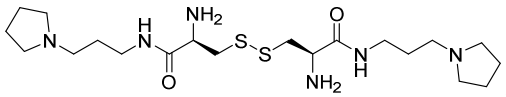
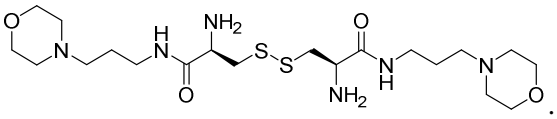
X-1,

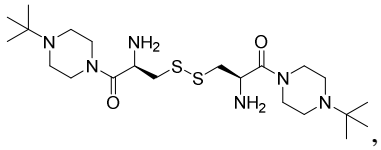
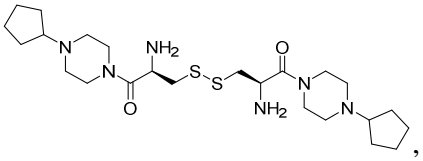
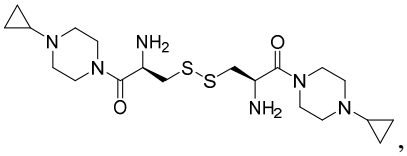
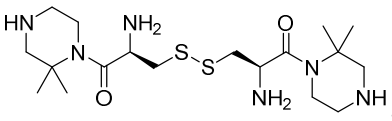
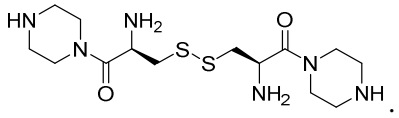
Wherein r is 0;

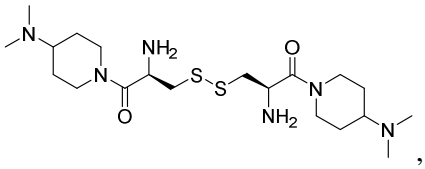
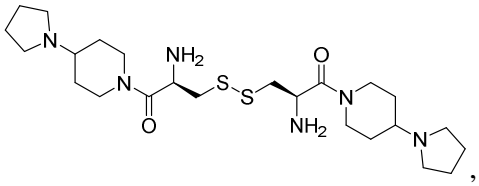
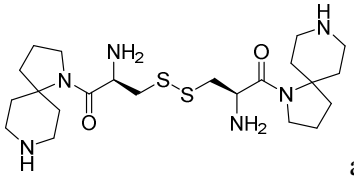
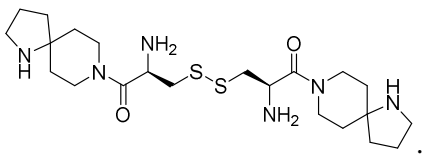
A is $CH(CH_2)_qNR^eR^f$, wherein q is 0; R^e and R^f, together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring.

11. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein the compound is selected from the group consisting of

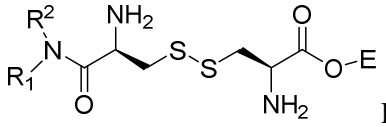

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, and

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12. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein the compound is selected from the group consisting of:

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, and

.

13. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein the compound is selected from the group consisting of

,

,

and

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14. A compound, a pharmaceutically acceptable salt thereof, a solvate thereof, or a prodrug thereof, wherein the compound is represented by Formula I,

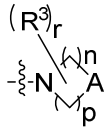

Formula II

wherein each pair of R^1 and R^2 are independently defined as follows:

a) R^1 and R^2 are each independently H or $(CH_2)_mNR^aR^b$, m is 2, 3 or 4; wherein R^a and R^b are each independently a C_{1-8}alkyl, alternatively R^a and R^b together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring, wherein a carbon in the 4 to 8-membered heterocyclic ring is optionally replaced with a heteroatom selected from the group consisting of O, S, NH, and N C_{1-8}alkyl, provided that at least one of R^1 and R^2 is $(CH_2)_mNR^aR^b$;

or

b) R^1 and R^2, together with the amide nitrogen link up to form a ring of formula P-1


P-1

wherein

R^3 is C_{1-8}alkyl; r is 0, 1, or 2;

n, p, and A are defined as follows:

i)

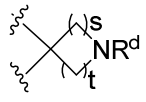
n and p are independently 2 or 3;

A is NR^c, wherein R^c is H, C_{1-8}alkyl, C_{3-8} cycloalkyl, C_{6-10}aryl or 5-10 membered heteroaryl;

ii)

n is 0, 1, or 2; p is 2 or 3 or 4;

A is a structure of Formula Q-1


Q-1

wherein R^d is H or C_{1-8}alkyl;

s is 0, 1, or 2; t is 2, 3 or 4; provided that when n is 0, s is 1 or 2;

or

iii)

n and p are independently 1, 2, 3 or 4;

A is $CH(CH_2)_qNR^eR^f$, wherein

R^e and R^f are independently H or C_{1-8}alkyl; q is 0-3;

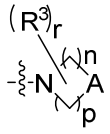
alternatively, R^e and R^f, together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring;

E is H or C_{1-8}alkyl.

15. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 14, wherein R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2 or 3; R^a and R^b are each independently a C_{1-2}alkyl.

16. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 14, wherein R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2 or 3; wherein R^a and R^b link up to form a 5 to 8-membered heterocyclic ring wherein a carbon in the ring is optionally replaced with O.

17. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 14, wherein R^1 and R^2, together with the amide nitrogen link up to form the ring of formula P-1

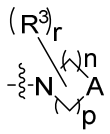


P-1

wherein r is 0, and n and p are independently 2 or 3 or 4;

A is NR^c, wherein R^c is hydrogen or methyl.

18. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 14, or a pharmaceutically acceptable salt thereof, wherein R^1 and R^2, together with the amide nitrogen link up to form the ring of formula P-1



P-1

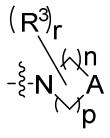
wherein r is 0, and n and p are independently 2, 3 or 4;

A is NR^c, wherein R^c is C_{2-8}alkyl or C_{3-8} cycloalkyl.

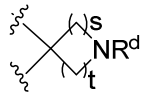
19. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 18, wherein n and p are independently 2, and R^c is

selected from the group consisting of tert-butyl, cyclopropyl, cyclobutyl, and cyclopentyl.

20. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 14, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula P-1


P-1,

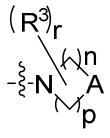
wherein r is 0, A is Formula Q-1


Q-1.

21. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 20, wherein n is 0, s is 1 or 2.

22. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 20, wherein n is 1 or 2, s is 0, 1 or 2.

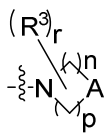
23. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula P-1


P-1,

r is 0; n and p are independently 1, 2, 3 or 4;

A is $CH(CH_2)_qNR^eR^f$, wherein R^e and R^f are independently $C_{1\text{-}8}$alkyl; q is 0-3.

24. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 1, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula P-1

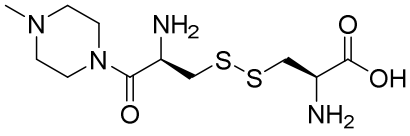
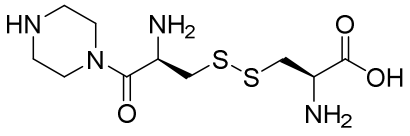
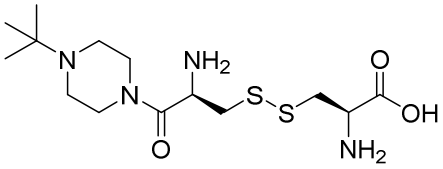
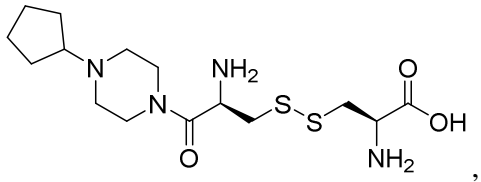
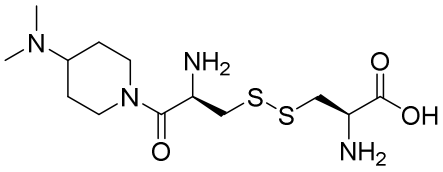
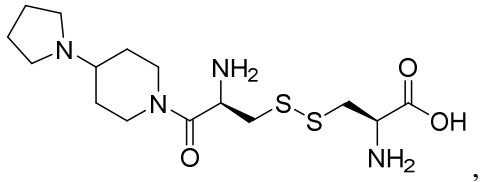
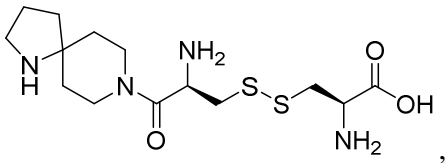
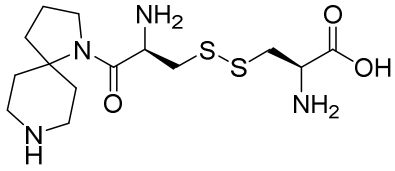

P-1,

Wherein r is 0;

A is $CH(CH_2)_qNR^eR^f$, wherein q is 0; R^e and R^f, together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring.

25. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of any one claims 14-24, wherein E is H.

26. The compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of claim 14, wherein the compound is selected from the group consisting of


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,

,

,

, and

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27. A pharmaceutical composition comprising the compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of any one of claims 1 to claim 26 and at least a pharmaceutically acceptable carrier.

28. The pharmaceutical composition of claim 27, wherein the pharmaceutically acceptable salt is a hydrochloric acid salt.

29. Use of a pharmaceutically effective amount of a compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of any one of claim 1 to claim 26 or the pharmaceutical composition of claim 27 or claim 28 in the manufacture of a medicament for treating a disease associated with a mutation at SLC3A1 gene and/or SLC7A9 gene.

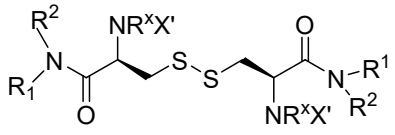
30. The use according to claim 29 wherein the disease is cystinuria.

31. Use of a pharmaceutically effective amount of a compound, the pharmaceutically acceptable salt thereof, the solvate thereof, or the prodrug thereof of any one of claims 1 to claim 26 or the pharmaceutical composition of claim 27 or claim 28 in the manufacture of a medicament for treating, inhibiting or retarding the growth of L-cystine kidney-stone formation in a subject in need thereof.

32. The use according to any one of claims 29-31, wherein the subject is a human.

33. The use of any one of claims 29-32, wherein a secondary agent selected from the group consisting of citrate supplementation, acetazolamide, and chelation agent is to be further administered to the subject.

34. A prodrug compound, a pharmaceutically acceptable salt thereof, or a solvate thereof, wherein the prodrug compound is represented by Formula III,


Formula III

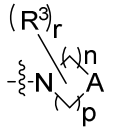
Wherein:

each pair of R^1 and R^2 are independently defined as follows:

a) R^1 is H or X', R^2 is $(CH_2)_mNR^aR^b$, m is 2, 3 or 4; wherein R^a and R^b are each independently a $C_{1\text{-}8}$alkyl, alternatively R^a and R^b together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring, wherein a carbon in the 4 to 8-membered heterocyclic ring is optionally replaced with a heteroatom selected from the group consisting of O, S, NH, and N $C_{1\text{-}8}$alkyl;

or

b) R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1


X-1

wherein

R^3 is $C_{1\text{-}8}$alkyl; r is 0, 1, or 2;

n, p, and A are defined as follows:

i)

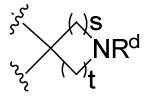
n and p are independently 2 or 3;

A is NR^c, wherein R^c is H, C_{2-8}alkyl, C_{3-8} cycloalkyl or X';

ii)

n is 0, 1, or 2; p is 2 or 3 or 4;

A is a structure of Formula Y-1



Y-1

wherein R^d is H, C_{1-8}alkyl or X';

s is 0, 1, or 2; t is 2, 3 or 4; provided that when n is 0, s is 1 or 2;

or

iii)

n and p are independently 1, 2, 3 or 4;

A is $CH(CH_2)_qNR^eR^f$, wherein

R^e and R^f are independently C_{1-8}alkyl, or one of R^e and R^f is C_{1-8}alkyl and the other is X'; q is 0-3;

alternatively, R^e and R^f, together with the N they are attached to, link up to form a 4 to 8-membered heterocyclic ring;

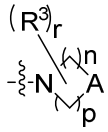
R^x is H or C_{1-6}alkyl;

X' is H, alkoxycarbonyl (R'OCO) or (acyloxy)alkoxycarbonyl (R'COOCH(R")OCO, wherein R' is H or C_{1-6}alkyl, R" is H or C_{1-6}alkyl, provided that at least one of the X' is not hydrogen.

35. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 34, wherein R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2 or 3; R^a and R^b are each independently a C_{1-2}alkyl.

36. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 34, wherein R^1 is H, R^2 is $(CH_2)_mNR^aR^b$, m is 2 or 3; wherein R^a and R^b link up to form a 5 to 8-membered heterocyclic ring wherein a carbon in the ring is optionally replaced with O.

37. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 34, wherein R^1 and R^2, together with the amide nitrogen link up to form the ring of formula X-1

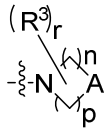

X-1

wherein r is 0, and n and p are independently 2 or 3 or 4;

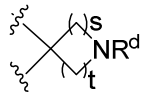
A is NR^c, wherein R^c is hydrogen, C_{2-8}alkyl or C_{3-8} cycloalkyl.

38. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 37, wherein n and p are independently 2, and R^c is selected from the group consisting of tert-butyl, cyclopropyl, cyclobutyl, and cyclopentyl.

39. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 34, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1


X-1,

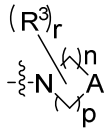
wherein r is 0, A is Formula Y-1


Y-1.

40. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 39, wherein n is 0, s is 1 or 2.

41. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 39, wherein n is 1 or 2, s is 0, 1 or 2.

42. The prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of claim 34, wherein R^1 and R^2, together with the amide nitrogen link up to form a ring of formula X-1


X-1,

r is 0; n and p are independently 1, 2, 3 or 4;

A is $CH(CH_2)_qNR^eR^f$, wherein R^e and R^f are independently C_{1-8}alkyl; q is 0-3.

43. A pharmaceutical composition comprising the prodrug compound, the pharmaceutically acceptable salt thereof, or the solvate thereof of any one of claims 34-42 and a pharmaceutically acceptale carrier.