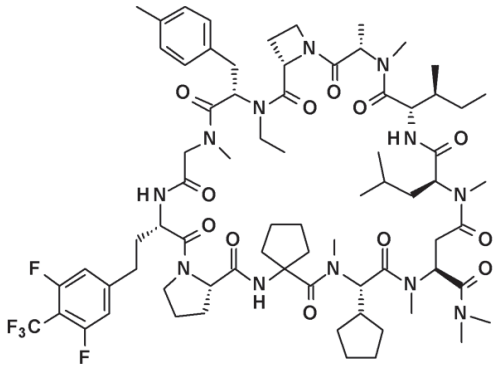
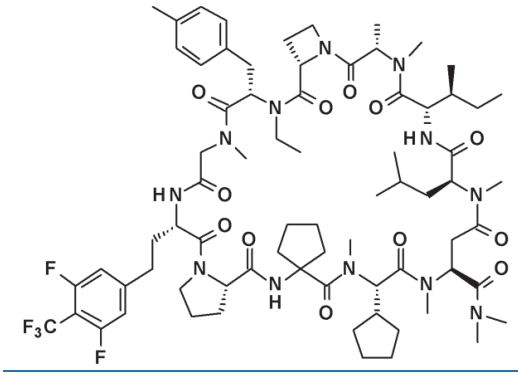
In one aspect, the present disclosure provides a crystal of a compound represented by the following formula (1):



Formula (1)

or a salt thereof, or a solvate thereof.

In another aspect, the present disclosure provides a method for producing a compound represented by the following formula (1), or a salt thereof, or a solvate thereof, by a liquid phase method, comprising linking the N-terminal amino acid residue and the C-terminal amino acid residue of a linear peptide compound by an amide bond in a solvent comprising one or more solvents selected from the group consisting of 2-MeTHF, dimethyl carbonate, anisole, isopropyl acetate, ethyl acetate, MTBE, CPME, 4-methyltetrahydropyran, heptane, toluene, acetonitrile, propionitrile, THF, 1,4-dioxane; and dimethoxyethane,



Formula (1).

In one non-limiting ~~embodiment~~examplet, the present ~~invention~~ disclosure encompasses the following:

[1] A method for producing a cyclic peptide compound or a salt thereof, or a solvate thereof, by a liquid phase method, comprising linking the N-terminal amino acid residue and the C-terminal amino acid residue of a peptide compound in a solvent (Solvent A), which comprises one or more

solvents selected from the group consisting of one or more water-immiscible solvents, one or more water-soluble alkyl nitriles, and one or more water-soluble ethers.

[1-1] The method of [1], wherein Solvent A comprises one or more solvents selected from the group consisting of 2-MeTHF, THF, 4-methyltetrahydropyran, MTBE, CPME, dimethyl carbonate, ethyl acetate, isopropyl acetate, anisole, MeCN, heptane, and toluene.

[2] The method of [1], wherein the N-terminal amino acid residue and the C-terminal amino acid residue are linked by an amide bond, or a bond selected from $-(CH_2)_nS(CH_2)_m-$, $-(CH_2)_nS(O)(CH_2)_m-$, or $-(CH_2)_nS(O)_2(CH_2)_m-$, wherein n and m are each independently 1 or 2.

[3] The method of [1] or [2], wherein the cyclic peptide compound comprises 8 to 20 amino acid residues, and wherein at least one of the amino acid residues is an unnatural amino acid residue.

[4] The method of any one of [1] to [3], wherein the cyclic peptide compound comprises 9 to 15 amino acid residues, and wherein at least one of the amino acid residues is an unnatural amino acid residue.

[5] The method of any one of [1] to [4], wherein the cyclic peptide compound comprises at least one N-substituted unnatural amino acid residue.

[6] The method of any one of [1] to [5], wherein the cyclic peptide compound comprises at least one N-unsubstituted unnatural amino acid residue.

[7] The method of any one of [1] to [6], wherein the cyclic peptide compound comprises at least one α,α di-substituted amino acid residue.

[8] The method of any one of [1] to [7], wherein either or both of the C-terminal amino acid residue and the N-terminal amino acid residue are amino acid residues that do not have an asymmetric carbon at the α-carbon of the carboxyl group.

[9] The method of any one of [1] to [8], wherein the C-terminal amino acid residue is an amino acid residue that does not have an asymmetric carbon at the α-carbon of the carboxyl group.

[10] The method of any one of [1] to [9], wherein the N-terminal amino acid residue is an N-unsubstituted amino acid residue.

[11] The method of any one of [1] to [10], wherein the cyclic peptide compound or salt thereof, or solvate thereof, is a solvate of the cyclic peptide compound.

[12] The method of any one of [1] to [11], wherein the solvate of the cyclic peptide compound is a hydrate of the cyclic peptide compound.

[13] The method of any one of [1] to [12], wherein the cyclic peptide compound is represented by the following formula:

[CLAIMS]

~~1. A method for producing a cyclic peptide compound or a salt thereof, or a solvate thereof, by a liquid phase method, comprising linking the N-terminal amino acid residue and the C-terminal amino acid residue of a peptide compound in a solvent (Solvent A), which comprises one or more solvents selected from the group consisting of one or more water-immiscible solvents, one or more water-soluble alkyl nitriles, and one or more water-soluble ethers.~~

~~2. The method of claim 1, wherein the N-terminal amino acid residue and the C-terminal amino acid residue are linked by an amide bond, or a bond selected from $-(CH_2)_nS(CH_2)_m-$, $-(CH_2)_nS(O)(CH_2)_m-$, or $-(CH_2)_nS(O)_2(CH_2)_m-$, wherein n and m are each independently 1 or 2.~~

~~3. The method of claim 1 or 2, wherein the cyclic peptide compound comprises 8 to 20 amino acid residues, and wherein at least one of the amino acid residues is an unnatural amino acid residue.~~

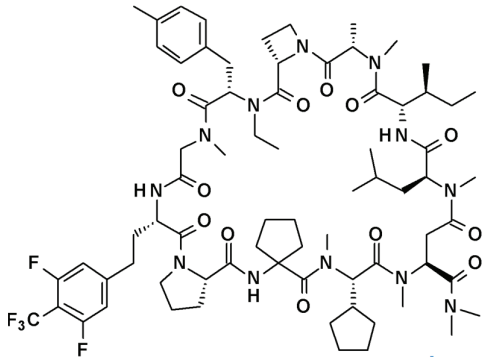
~~4. The method of any one of claims 1 to 3, wherein the cyclic peptide compound comprises at least one N-substituted unnatural amino acid residue.~~

~~5. The method of any one of claims 1 to 4, wherein the cyclic peptide compound comprises at least one N-unsubstituted unnatural amino acid residue.~~

~~6. The method of any one of claims 1 to 5, wherein either or both of the C-terminal amino acid residue and the N-terminal amino acid residue are amino acid residues that do not have an asymmetric carbon at the α-carbon of the carboxyl group.~~

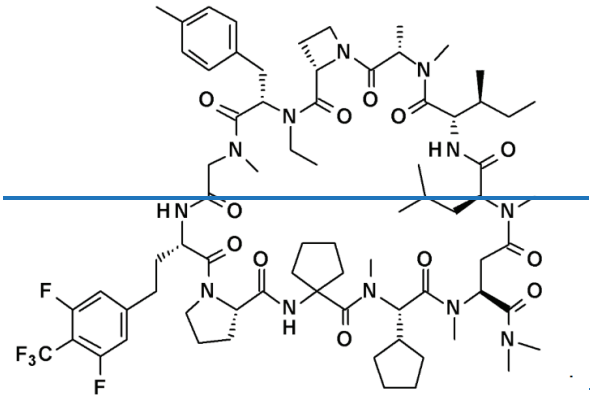
~~7. The method of any one of claims 1 to 6, wherein the cyclic peptide compound or salt thereof, or solvate thereof, is a solvate of the cyclic peptide compound.~~

~~8. The method of any one of claims 1 to 7, wherein the cyclic peptide compound is represented by the following formula:~~



~~9. The method of any one of claims 1 to 8, further comprising isolating and/or purifying the cyclic peptide compound by crystallization to obtain a crystal of the cyclic peptide compound.~~

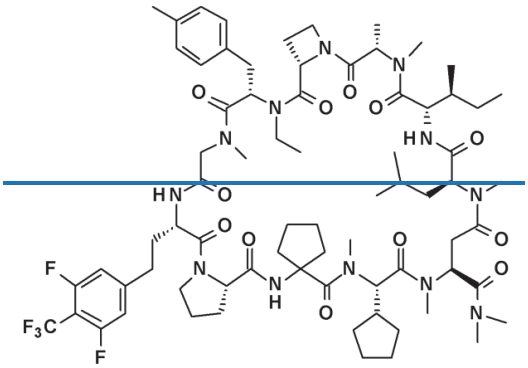
~~10. The method of claim 9, wherein the crystal of the cyclic peptide compound is an unsolvate crystal or solvate crystal of the cyclic peptide compound represented by the following formula:~~



~~11. The method of claim 10, wherein the solvate crystal of the cyclic peptide compound is a hydrate crystal.~~

~~12. The method of claim 11, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) comprising 7 peaks selected from the group consisting of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).~~

~~13. A crystal of a cyclic peptide compound represented by the following formula:~~

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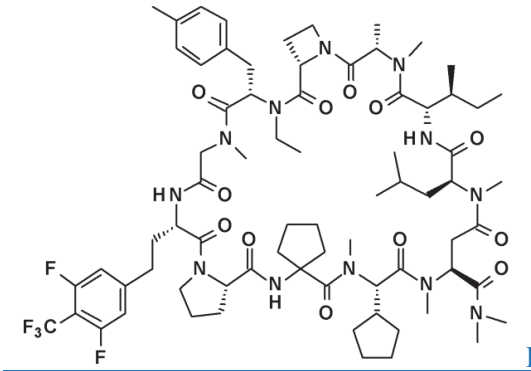
~~or a salt thereof, or a solvate thereof.~~

~~14. The crystal of claim 13, wherein the crystal is selected from the group consisting of an unsolvate crystal, a solvate crystal, a crystal of a salt, and a solvate crystal of a salt.~~

~~15. The crystal of claim 14, wherein the solvate crystal is a hydrate crystal.~~

~~16. The crystal of claim 15, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) comprising 7 peaks selected from the group consisting of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).~~

1. A crystal of a compound represented by the following formula (1):



Formula (1)

or a salt thereof, or a solvate thereof.

2. The crystal of claim 1, wherein the crystal is selected from the group consisting of an unsolvate crystal, a solvate crystal, a crystal of a salt, and a solvate crystal of a salt.

3. The crystal of claim 2, wherein the crystal is a solvate crystal.

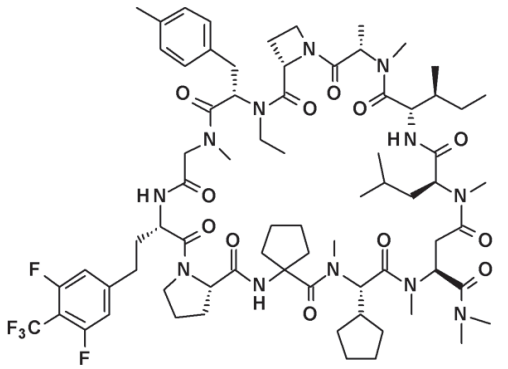
4. The crystal of claim 3, wherein the solvate crystal is a hydrate crystal.

5. The crystal of claim 4, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) comprising 7 peaks selected from the group consisting of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).

6. The crystal of claim 4, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) comprising 10 peaks selected from the group consisting of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).

7. The crystal of claim 4, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).

8. A method for producing a compound represented by the following formula (1), or a salt thereof, or a solvate thereof, by a liquid phase method, comprising linking the N-terminal amino acid residue and the C-terminal amino acid residue of a linear peptide compound by an amide bond in a solvent comprising one or more solvents selected from the group consisting of 2-MeTHF, dimethyl carbonate, anisole, isopropyl acetate, ethyl acetate, MTBE, CPME, 4-methyltetrahydropyran, heptane, toluene, acetonitrile, propionitrile, THF, 1,4-dioxane; and dimethoxyethane,



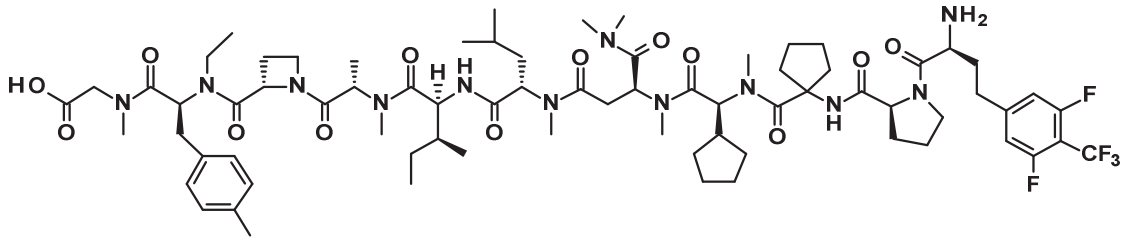
Formula (1).

9. The method of claim 8, wherein either or both of the C-terminal amino acid residue and the N-terminal amino acid residue of the linear peptide compound are amino acid residues that do

not have an asymmetric carbon at the α-carbon of the carboxyl group.

10. The method of claim 9, wherein the C-terminal amino acid residue of the linear peptide compound is an amino acid residue that does not have an asymmetric carbon at the α-carbon of the carboxyl group.

11. The method of claim 10, wherein the linear peptide compound is:




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12. The method of claim 11, wherein the compound represented by the formula (1) or salt thereof, or solvate thereof, is a solvate of the compound represented by the formula (1).

13. The method of claim 12, wherein the solvate of the compound represented by the formula (1) is a hydrate of the compound represented by the formula (1).

14. The method of claim 11, wherein the compound represented by the formula (1) or salt thereof, or solvate thereof, is a compound represented by the formula (1).

15. The method of claim 8, wherein the compound represented by the formula (1) or salt thereof, or solvate thereof, is a solvate of the compound represented by the formula (1).

16. The method of claim 15, wherein the solvate of the compound represented by the formula (1) is a hydrate of the compound represented by the formula (1).

17. The method of claim 8, wherein the compound represented by the formula (1) or salt thereof, or solvate thereof, is a compound represented by the formula (1).

18. The method of claim 8, wherein the solvent comprises one or more solvents selected from the group consisting of 2-MeTHF, THF, 4-methyltetrahydropyran, MTBE, CPME, dimethyl carbonate, ethyl acetate, isopropyl acetate, anisole, MeCN, heptane, and toluene.

19. The method of any one of claims 8 to 18, further comprising isolating and/or purifying

the compound represented by the formula (1) or salt thereof, or solvate thereof, by crystallization to obtain a crystal of the compound represented by the formula (1) or salt thereof, or solvate thereof.

20. The method of claim 19, wherein the crystal of the compound represented by the formula (1) or salt thereof, or solvate thereof, is an unsolvate crystal or solvate crystal of the compound represented by the formula (1).

21. The method of claim 20, wherein the unsolvate crystal or solvate crystal of the compound represented by the formula (1) is a solvate crystal of the compound represented by the formula (1).

22. The method of claim 21, wherein the solvate crystal of the compound represented by the formula (1) is a hydrate crystal.

23. The method of claim 22, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) comprising 7 peaks selected from the group consisting of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).

24. The method of claim 22, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) comprising 10 peaks selected from the group consisting of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).

25. The method of claim 22, wherein the hydrate crystal is a Form C crystal characterized by powder X-ray diffraction peaks at diffraction angles (2θ values) of 4.964°, 7.921°, 8.296°, 8.855°, 9.956°, 10.435°, 11.729°, 12.704°, 13.552°, 13.901°, 15.895°, 16.643°, and 17.813° (±0.2°).