Claim

1. A peptide, peptidomimetic or amino acid derivative having a net positive charge of at least +2 at pH 7.0 and incorporating a disubstituted β amino acid, each of the substituting groups in the β amino acid, which may be the same or different, comprises at least 7 non-hydrogen atoms, is lipophilic and has at least one cyclic group, one or more cyclic groups within a substituting group may be linked or fused to one or more cyclic groups within the other substituting group and where cyclic groups are fused in this way the combined total number of non-hydrogen atoms for the two substituting groups is at least 12, and wherein said peptide, peptidomimetic or amino acid derivative is 1 to 4 amino acids or equivalent subunits in length, for use as a cytolytic therapeutic agent.

2. The peptide, peptidomimetic or amino acid derivative as claimed in claim 1 for use as claimed in claim 1 wherein the two substituting groups are the same.

3. The peptide, peptidomimetic or amino acid derivative as claimed in claim 1 or claim 2 for use as claimed in claim 1 or 2 wherein the β amino acid is a $\beta^{2,2}$ or $\beta^{3,3}$ disubstituted amino acid.

4. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim for use as claimed in any preceding claim wherein each of the lipophilic substituting groups comprises an optionally substituted phenyl or cyclohexyl group.

5. The peptide, peptidomimetic or amino acid derivative as claimed in claim 4 for use as claimed in claim 4 wherein said phenyl or cyclohexyl groups are separated from the α or β carbon atom of the β amino acid by 1 to 4 linking atoms.

6. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim for use as claimed in any preceding claim wherein each of the lipophilic substituting groups comprises 8 to 12 non-hydrogen atoms.

7. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim for use as claimed in any preceding claim wherein the C terminus of the peptide, peptidomimetic or amino acid derivative is amidated and optionally substituted.

8. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim for use as claimed in any preceding claim wherein the peptide or peptidomimetic incorporates a cationic amino acid, preferably arginine or lysine.

9. A peptide, peptidomimetic or amino acid derivative as defined in any preceding claim for use as an antimicrobial agent.

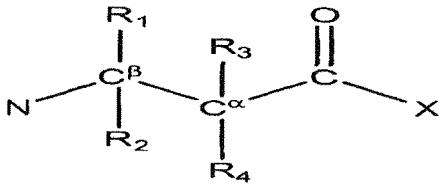
10. A peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 for use as an antitumoural agent.

11. An ex *vivo* use of a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 as a cytolytic agent.

12. Use of a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 in the manufacture of a medicament for treating a microbial infection.

13. Use of a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 in the manufacture of a medicament for treating tumour cells or preventing or reducing the growth, establishment spread, or metastasis of a tumour.

14. A peptide, peptidomimetic or amino acid derivative having a net positive charge of at least +2 at pH 7.0 which incorporates a β amino acid shown as a group of formula I:



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wherein any 2 from R_1, R_2, R_3 and R_4, are hydrogen atoms and 2 are substituting groups, which may be the same *or* different, comprise at least 7 non-hydrogen atoms, are lipophilic and include a cyclic group, said cyclic group not

being attached directly to the α or β carbon atom but optionally being linked or fused to a cyclic group in the other substituting group, where cyclic groups are fused the combined total number of non-hydrogen atoms for the two substituting group is at least 12, and wherein X represents O, C, N or S, and wherein said peptide, peptidomimetic or amino acid derivative is 1 to 4 amino acids or equivalent subunits in length.

15. The peptide, peptidomimetic or amino acid derivative as claimed in claim 14 wherein the two substituting groups are the same.

16. The peptide, peptidomimetic or amino acid derivative as claimed in claim 14 or claim 15 wherein the β amino acid is a $\beta^{2,2}$ or $\beta^{3,3}$ disubstituted amino acid.

17. The peptide, peptidomimetic or amino acid derivative as claimed in any one of claims 14 to 16 wherein each of the lipophilic substituting groups comprises an optionally substituted phenyl or cyclohexyl group.

18. The peptide, peptidomimetic or amino acid derivative as claimed in claim 17 wherein said phenyl or cyclohexyl groups are separated from the α or β carbon atom of the β amino acid by 1 to 4 linking atoms.

19. The peptide, peptidomimetic or amino acid derivative as claimed in any one of claims 14 to 18 wherein each of the lipophilic substituting groups comprises 8 to 12 non-hydrogen atoms.

20. The peptide, peptidomimetic or amino acid derivative as claimed in any one of claims 14 to 19 wherein the C terminus of the peptide, peptidomimetic or amino acid derivative is amidated and optionally substituted.

21. The peptide, peptidomimetic or amino acid derivative as claimed in any one of claims 14 to 20 wherein the peptide or peptidomimetic incorporates a cationic amino acid, preferably arginine or lysine.

22. A formulation comprising a peptide, peptidomimetic or amino acid derivative as claimed in any one of claims 14 to 21 and a diluent, carrier or excipient.

23. A peptide, peptidomimetic or amino acid derivative as claimed in any one of claims 14 to 21 for use in therapy.

24. A product comprising (a) a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 or claimed in any one of claims 14 to 21 and (b) a further antimicrobial agent as a combined preparation for separate, simultaneous or sequential use in the treatment of an antimicrobial infection.

25. A product comprising (a) a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 or claimed in any one of claims 14 to 21 and (b) a further antitumoural agent as a combined preparation for separate, simultaneous or sequential use in the treatment of tumour cells.

Claim

1. A peptide, peptidomimetic or amino acid derivative having a net positive charge of at least +2 at pH 7.0 and incorporating a disubstituted β amino acid, each of the substituting groups in the β amino acid, which may be the same or different, comprises at least 7 non-hydrogen atoms, is lipophilic and has at least one cyclic group, one or more cyclic groups within a substituting group may be linked or fused to one or more cyclic groups within the other substituting group and where cyclic groups are fused in this way the combined total number of non-hydrogen atoms for the two substituting groups is at least 12, and wherein said peptide, peptidomimetic or amino acid derivative is 1 to 4 amino acids or equivalent subunits in length, for use as a cytolytic therapeutic agent.

2. The peptide, peptidomimetic or amino acid derivative as claimed in claim 1 wherein the two substituting groups are the same.

3. The peptide, peptidomimetic or amino acid derivative as claimed in claim 1 or claim 2 wherein the β amino acid is a $\beta^{2,2}$ or $\beta^{3,3}$ disubstituted amino acid.

4. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim wherein each of the lipophilic substituting groups comprises an optionally substituted phenyl or cyclohexyl group.

5. The peptide, peptidomimetic or amino acid derivative as claimed in claim 4 wherein said phenyl or cyclohexyl groups are separated from the α or β carbon atom of the β amino acid by 1 to 4 linking atoms.

6. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim wherein each of the lipophilic substituting groups comprises 8 to 12 non-hydrogen atoms.

7. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim wherein the C terminus of the peptide, peptidomimetic or amino acid derivative is amidated and optionally substituted.

8. The peptide, peptidomimetic or amino acid derivative as claimed in any preceding claim wherein the peptide or peptidomimetic incorporates a cationic amino acid, preferably arginine or lysine.

9. A peptide, peptidomimetic or amino acid derivative as defined in any preceding claim for use as an antimicrobial agent.

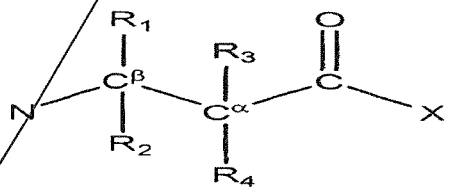
10. A peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 for use as an antitumoural agent.

11. An ex *vivo* use of a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 as a cytolytic agent.

12. Use of a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 in the manufacture of a medicament for treating a microbial infection.

13. Use of a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 in the manufacture of a medicament for treating tumour cells or preventing or reducing the growth, establishment spread, or metastasis of a tumour.

14. A peptide, peptidomimetic or amino acid derivative having a net positive charge of at least +2 at pH 7.0 which incorporates a group of formula I:



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wherein any 2 from R_1, R_2, R_3 and R_4, are hydrogen atoms and 2 are substituting groups, which may be the same *or* different, comprise at least 7 non-hydrogen atoms, are lipophilic and include a cyclic group, said cyclic group not

being attached directly to the α or β carbon atom but optionally being linked or fused to a cyclic group in the other substituting group, where cyclic groups are fused the combined total number of non-hydrogen atoms for the two substituting group is at least 12, and wherein X represents O, C, N or S, and wherein said peptide, peptidomimetic or amino acid derivative is 1 to 4 amino acids or equivalent subunits in length.

15. A formulation comprising a molecule as claimed in claim 14 and a diluent, carrier or excipient.

16. A peptide, peptidomimetic or amino acid derivative as claimed in claim 14 for use in therapy.

17. A product comprising (a) a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 or claimed in claim 14 and (b) a further antimicrobial agent as a combined preparation for separate, simultaneous or sequential use in the treatment of an antimicrobial infection.

18. A product comprising (a) a peptide, peptidomimetic or amino acid derivative as defined in any one of claims 1 to 8 or claimed in claim 14 and (b) a further antitumoural agent as a combined preparation for separate, simultaneous or sequential use in the treatment of tumour cells.