

CLAIMS

1. An amino acid sequence of 17-22 amino acids long and comprising, at its N-terminus, SEQ ID NO:12 ($X_0X_1X_2CX_3X_4X_5CX_6X_7X_8X_9CYX_{10}X_{11}CX_{12}X_{13}$) wherein

- X_0 is absent or proline
- X_1 is lysine, arginine, glycine, or proline;
- X_2 is phenylalanine, tryptophan, or arginine;
- X_3 is phenylalanine, valine or tryptophan;
- X_4 is arginine, tyrosine or phenylalanine;
- X_5 is valine or alanine;
- X_6 is tyrosine, arginine, lysine or tryptophan;
- X_7 is arginine, phenylalanine, or glycine;
- X_8 is arginine or glycine;
- X_9 is isoleucine, alanine, phenylalanine, tyrosine or valine;
- X_{10} is arginine or histidine;
- X_{11} is arginine or lysine
- X_{12} is arginine, lysine, alanine, or asparagine;
- X_{13} is a 0-4 amino-acid-long polypeptide;

with provisos that

- if X_0 is proline, then X_1 is not proline;
- if said amino acid sequence comprises SEQ ID NO: 13 (KWCFRVCYRGICYRRCR), or SEQ ID NO: 28 (KWCFRVCYRGICYRKCR) then X_{13} is 1-4 amino acids long;
- if X_{13} is 1 amino acid long or longer, then the N-terminal amino acid in X_{13} is asparagine, arginine, aspartic acid or glutamic acid;
- if the amino acid at position corresponding to position 1 of SEQ ID NO: 1 is glycine, then said glycine is not acyl- or palmitic acid – modified;
- if amino acid is X_{11} lysine then $X_6X_7X_8X_9$ (SEQ ID NO: 14) is not RRRF (SEQ ID NO: 15); and
- if the amino acid is GFCWYVCYRGICYRRCN (SEQ ID NO: 16) then the C-terminal asparagine is amidated.

2. The amino acid sequence according to claim 1, wherein X_0 is proline.
3. The amino acid sequence according to claim 1 or 2, wherein X_6 is arginine or tyrosine.
4. The amino acid sequence according any one of claims 1-3, wherein X_7 is arginine or glycine.
5. The amino acid sequence according to claim 4, wherein X_7 is arginine.
6. The amino acid sequence according any one of claims 1-5 wherein X_9 is isoleucine, alanine, phenylalanine, or valine.
7. The amino acid sequence of claim 1, wherein X_9 is isoleucine.
8. The amino acid sequence of any one of claims 1-7, wherein X_1 is lysine.

9. The amino acid sequence according to any one of claims 1-8, wherein X_{12} is arginine, lysine, or asparagine.
10. The amino acid sequence according to any one of claims 1-9, wherein X_{13} is 1 amino acid long or longer, and the N-terminal amino acid in X_{13} is aspartic acid or glutamic acid.
11. The amino acid sequence of any one of claims 1-10, wherein $X_6X_7X_8X_9$ (SEQ ID NO: 14) is selected from the group consisting of YRGI (SEQ ID NO: 17), YRGV (SEQ ID NO: 18), YRGF (SEQ ID NO: 19).
12. The amino acid sequence of any one of claims 1-11, wherein X_{10} is arginine.
13. The amino acid sequence of any one of claims 1-12, wherein X_{11} is arginine.
14. The amino acid sequence of any one of claims 1-13, wherein $X_3X_4X_5$ (SEQ ID NO: 20) is FRV (SEQ ID NO: 21), WYV (SEQ ID NO: 22).
15. The amino acid sequence according to any one of claims 1-14, wherein X_1 is proline.
16. The amino acid sequence according to any one of claims 1-15, wherein the C-terminal amino acid of said sequence is aspartic acid.
17. A multimer comprising a plurality of repeats of the amino acid sequence according to claim 16.
18. The multimer of claim 17, wherein said repeats are joined to each other directly.
19. The multimer of claim 17 or 18 wherein the plurality is between 2 and 20.
20. A method of making the amino acid sequence according to claim 16, comprising:
 - a) synthesizing a multimer according to any one of claims 17-19; and
 - b) contacting said multimer with a mild acid thereby breaking D-P bonds.
21. The amino acid sequence according to claim 1, selected from the group consisting of KFCVYVCYRGICYRRCK (SEQ ID NO: 23), KWCFRVCYRGVCYRRCR (SEQ ID NO: 24), KWCFRVCRRRFCYRRCR (SEQ ID NO: 25), GFCWYVCYRGICYRRCN-NH₂ (SEQ ID NO: 26), and GFCWYVCYRGFCYRRCN-NH₂ (SEQ ID NO: 27), PKWCFRVCYRGICYRRCR (SEQ ID NO: 28); PKWCFRVCYRGICYRRCRD (SEQ ID NO: 29); PWCFRVCYRGICYRRCR (SEQ ID NO: 30); PWCFRVCYRGICYRRCRD (SEQ ID NO: 31).
22. The amino acid sequence of claim 1, wherein said amino acid sequence is 18-21 amino acids long and comprises, at its N-terminus, SEQ ID NO: 1 (KWCFRVCYRGICYRRCRD) or SEQ ID NO: 29 (PKWCFRVCYRGICYRRCRD) or a peptide that differs from SEQ ID NO: 1 or SEQ ID NO: 29 by one, two, three, or four amino acids, wherein the amino acids differing from the amino acids of SEQ ID NO: 1 or SEQ ID NO: 29 are independently selected from the group consisting of
 - arginine or glycine at position corresponding to position 1 of SEQ ID NO: 1;
 - phenylalanine or arginine at position corresponding to position 2 of SEQ ID NO: 1;
 - valine or tryptophan at position corresponding to position 4 of SEQ ID NO: 1;

tyrosine at position corresponding to position 5 of SEQ ID NO: 1;
arginine at position corresponding to position 8 of SEQ ID NO: 1;
glycine at position corresponding to position 9 of SEQ ID NO: 1;
arginine at position corresponding to position 10 of SEQ ID NO: 1;
alanine, phenylalanine, or valine at position corresponding to position 11 of SEQ ID NO: 1;

histidine at position corresponding to position 14 of SEQ ID NO: 1;
lysine at position corresponding to position 15 of SEQ ID NO: 1;
asparagine at position corresponding to position 17 of SEQ ID NO: 1

23. The amino acid sequence according to claim 22, comprising aspartic acid at position corresponding to position 18 of SEQ ID NO: 1.

24. The amino acid sequence according any one of claims 22-23, comprising asparagine at position corresponding to position 17 of SEQ ID NO: 1.

25. The amino acid sequence according to any one of claims 22-24, comprising glycine at position corresponding to position 1 of SEQ ID NO: 1.

26. The amino acid sequence according to any one of claims 22-25, comprising alanine at position corresponding to position 11 of SEQ ID NO: 1.

27. The amino acid sequence according to any one of claims 22-26, wherein arginine is present at position corresponding to position 14 of SEQ ID NO: 1, at position corresponding to position 15 of SEQ ID NO: 1, or both.

28. The amino acid sequence according to any one of claims 22-27, comprising arginine at position corresponding to position 14 of SEQ ID NO: 1 and position corresponding to position 15 of SEQ ID NO: 1.

29. The amino acid sequence according to any one of claims 22-28, wherein said amino acid sequence is 18 amino acids long.

30. The amino acid sequence of any one of claims 22-29, wherein the peptide differs from SEQ ID NO: 1 by three, two, or one amino acid.

31. The amino acid sequence according to claim 22 comprising, at its N-terminus, SEQ ID NO: 1, SEQ ID NO: 2 (RWCFRVCYRGICYRRCRD), SEQ ID NO: 3 (GWCFRVCYRGICYRRCRD), SEQ ID NO: 4 (KWCFRVCYRGICYRRCRD); SEQ ID NO: 5 (KWCYFVCYRGICYRRCRD), SEQ ID NO: 6 (KWCFRVCRRGICYRRCRD), SEQ ID NO: 7 (KWCFRVCYRGVCYRRCRD), SEQ ID NO: 8 (KWCFRVCYRGACYRRCRD), SEQ ID NO: 9 (KWCFRVCYRGFCYRRCRD), SEQ ID NO: 10 (KWCFRVCYRGICYHRCRD), SEQ ID NO: 11 (KWCFRVCYRGICYRRCND).

32. The amino acid sequence according to claim 31 comprising SEQ ID NO: 1 SEQ ID NO: 3 or SEQ ID NO: 12.

33. The amino acid sequence according to claim 31 comprising SEQ ID NO:4 or SEQ ID NO: 5 or SEQ ID NO: 6 or SEQ ID NO: 8.

34. Use of a formulation comprising the amino acid sequence according to any one of claims 1-16, or any one of claims 22-33, in the manufacture of a medicament for the treatment of a skin infection in an animal in need thereof, wherein said medicament is to be administered to the animal.

35. The use of claim 34, wherein said formulation is to be administered topically.

36. The use of any one of claims 33-35, wherein the animal is a dog.

37. Use of a formulation comprising the amino acid sequence according to any one of claims 1-16, or any one of claims 22-33, in the manufacture of a medicament for the treatment of mastitis in an animal in need thereof, wherein said medicament is to be administered to the animal.

38. The use of claim 37 wherein said formulation is to be administered to the mammary gland of the animal.

39. The use of claim 37 or 38, wherein said animal is a female bovine, ovine, porcine, or caprine.

40. Use of a formulation comprising the amino acid sequence according to any one of claims 1-16, or any one of claims 22-33, in the manufacture of a medicament for the treatment of respiratory infection in an animal in need thereof, wherein said medicament is to be administered to the animal.

41. The use of claim 40 wherein said animal is a bovine, an ovine, a porcine, a caprine, an equine, a feline or a canine animal.

42. The use according to claim 41 wherein the canine animal is a dog.

43. The use according to claim 41 or 42, wherein the medical condition is a respiratory infection or mastitis.

44. The use according to any one of claims 41-43, formulated for a topical administration.

45. The use according to claim 44, formulated into a cream, an ointment, a spray, or an emulsion.

46. A formulation comprising the amino acid sequence according to any one of claims 1-16, or any one of claims 22-33 for use as a medicament.