CLAIMS

1. A fusion protein comprising an endolysin having the activity of degrading the cell wall of Gram-positive bacteria and a peptide stretch fused to the endolysin at the N- or C-terminus, wherein the peptide stretch consists of 5 to 100 amino acid residues and wherein the peptide stretch is a cationic peptide, polycationic peptide, amphipathic peptide, sushi peptide, defensin, hydrophobic peptide or an antimicrobial peptide.

2. The fusion protein according to claim 1, wherein said fusion protein comprises an additional amino acid residue on the N-terminus.

3. The fusion protein according to claim 1 or 2, wherein said fusion protein exhibits an amino acid sequence according to SEQ ID NO: 63 to 90.

4. The fusion protein according to any of the preceding claims, wherein said fusion protein comprises a tag or additional protein on the C- and/or N-terminus.

5. The fusion protein according to claim 4, wherein said tag or additional protein is linked to the fusion protein by one or more additional amino acid residues.

6. The fusion protein according to any of the preceding claims, wherein the peptide stretch is linked to the fusion protein by one or more additional amino acid residues.

7. The fusion protein according to claim 1, wherein the endolysin exhibits an amino acid sequence according to SEQ ID NO: 57 to 61.

8. The fusion protein according to any of the preceding claims, wherein the Gram-positive bacteria are selected from the group consisting of the bacteria listed in table 1.

9. The fusion protein according to claim 1, wherein the sushi peptide exhibits an amino acid sequence according to SEQ ID NO: 54.

10. The fusion protein according to claim 1, wherein the cationic peptide comprises at least one amino acid residue selected out of the group consisting of arginine, histidine and lysine residues.

11. The fusion protein according to claim 1, wherein the antimicrobial peptide exhibits an amino acid sequence according to SEQ ID NO:1 to 11 or 48 to 53.

12. The fusion protein according to claim 1, wherein the hydrophobic peptide exhibits an amino acid sequence according to SEQ ID NO: 12, 50, 55 or 56.

13. The fusion protein according to claim 1, wherein at least about 70% of the amino acid residues comprised in said cationic peptide are either arginine, histidine or lysine residues, or wherein at least about 70% of the amino acid residues comprised in said peptide are either arginine or lysine, or wherein the amino acid residues comprised in said peptide are either arginine or lysine residues.

14. The fusion protein according to claim 13, wherein the cationic peptide exhibits an amino acid sequence according to SEQ ID NO: 13 or 24 to 44.

15. The fusion protein according to claim 1, wherein the amphipatic peptide comprises at least one positively charged amino acid residues selected out of the group consisting of lysine, arginine and histidine residues, combined to at least one hydrophobic amino acid residue selected out of the group consisting of valine, isoleucine, leucine, methionine, phenylalanine, tryptophan, cysteine, alanine, tyrosine, histidine, threonin, serine, proline and glycine residues.

16. The fusion protein according to claim 15, wherein at least about 70% of the said amino acid residues in said amphipatic peptide are either arginine or lysine residues and at least about 30% of the said amino acid residues in said amphipatic peptide are valine, isoleucine, leucine, methionine, phenylalanine, tryptophan, cysteine, alanine, tyrosine, histidine, threonin, serine, proline or glycine residues.

17. The fusion protein according to claim 16, wherein the amphipatic peptide exhibits an amino acid sequence according to SEQ ID NO: 1 to 5, 23, 48 or 49.

18. The fusion protein according to any one of claims 1 to 17, wherein the peptide stretch comprises ~~about 5 to about 100 amino acid residues, in particular~~ about 5 to 50 amino acid residues, in particular about 5 to 30 amino acid residues.

19. An isolated nucleic acid molecule encoding a fusion protein according to any of claims 1 to 17.

20. A vector comprising the nucleic acid molecule according to claim 19.

21. A host cell comprising the nucleic acid molecule according to claim 19 or the vector according to claim 20.

22. A host cell according to claim 21, wherein the cell is a bacterial cell or a yeast cell.

23. A host cell according to claim 22, wherein the yeast cell is *Pichia pastoris* cell.

24. The fusion protein according to any one of claims 1 to 18 for use as a medicament, diagnostic means or cosmetic substance.

25. The fusion protein according to any one of claims 1 to 18 for use as a medicament for treatment or prevention of Gram-positive bacterial infections.

26. The fusion protein according to any one of the claims 1 to 18 for use as a disinfectant.

27. The use of the fusion protein according to any one of claims 1 to 18 for the treatment or prevention of Gram-positive bacterial contamination of foodstuff, of food processing equipment, of food processing plants, of surfaces coming into contact with foodstuff, of medical devices, of surfaces in hospitals and surgeries.

28. The use of the fusion protein according to any one of claims 1 to 18 as a diagnostic means in medicinal, food or feed or environmental diagnostics.

29. Pharmaceutical composition comprising a fusion protein according to any one of claims 1 to 18.