Antimicrobial Fusion Peptides

Background

Antimicrobial fusion peptides result from “fusing” or joining different peptides to form a new polypeptide with properties that could be different from the original peptides. Combining or fusing active peptides may be particularly advantageous against pathogens not previously sensitive to other antimicrobials, with greater efficacy and increased stability potentially being achieved as a result.

Technology

Antimicrobial peptides have been isolated from a variety of sources such as plants, amphibians, insects and microorganisms. Many of these have not been developed for use as antimicrobial agents because they usually have one or more disadvantages associated with their activity. For example some are toxic and have haemolytic effects, and others simply do not have broad spectrum activity or sufficiently strong activity to be therapeutically useful.

To address these issues, Dstl scientists have engineered new antimicrobial peptides based on the human peptide LL-37, or an active fragment of it. The LL-37 peptide has been fused with another bioactive peptide or an active fragment where part or all of the amino acid sequence of the fusion peptide is predicted to form an alpha-helix structure for disruption of a pathogen cell membrane. This approach significantly increases the effectiveness of antimicrobial peptides. Combining or fusing active peptides may be particularly advantageous against pathogens that were not previously susceptible. In addition use of the human LL-37 peptide may reduce toxicity and the fusion structure can often be more stable against proteases than the constituent peptides alone.

The patent describes various embodiments of peptide fusions and their activity against various micro-organisms as well as their conformational variants and modes of action.

Applications

Fusion peptides of the disclosure may be particularly useful in the treatment of:

• S. aureus and/or B. cepacia and/or Y. pseudotuberculosis infections
• Athletes foot, onychomycosis, Candida albicans etc. in a variety of possible pharmaceutical delivery methods such as powders, creams etc.

Benefits

• Improved antimicrobial efficacy
• Reduced toxicity
• Improved stability

Intellectual Property

Patents applied for:
WO2010/061203
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