

Peptide Killers of Bacteria

A method for designing unique peptides that can selectively target and disrupt cellular membranes of pathogens without damaging human cells.



Seeking

Development partner
Commercial partner
Licensing
University spinout
Investment

IP Status

Patent application
submitted (EP)

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CHALLENGE

Increasing incidence of antibiotic resistance in bacteria along with a steady decline in the discovery of new antibiotics present a global health challenge. There is a need for discovery of alternative class of antibiotics and antimicrobial peptides (AMPs) have emerged as a promising candidate for such new antibiotics. Especially, the peptides which are able to form leaky transmembrane pores in the bacterial cytoplasmic membrane are of particular interest as they can directly kill the antibiotic resistant bacteria.

Over the last few decades, a number of natural and synthetic membrane-permeabilizing AMPs with various poreforming abilities have been discovered. However, fundamental rules for the guided development of pore-forming peptides are missing. The determination of such rules is challenging because a single amino acid substitution has been reported to be enough to cause a dramatic change in the pore structure or even completely change the peptide mode of action.

TECH OVERVIEW

Scientists at Masaryk University have invented a novel method for designing unique peptides that can selectively target and disrupt cellular membranes of pathogens without damaging human cells. This method exploits the different lipid compositions on the surface of human cells' and pathogens' membranes. A disruption of a protective function of membranes by antimicrobial peptides (AMPs) results in cellular death of the pathogens.

Researchers have already purified and characterized new peptides able to kill resistant bacteria, both gram-positive and gram-negative, at micromolar concentrations. These peptides thus demonstrate the potential of a novel class antimicrobial agents. Moreover, another advantage of our method lays in determining the role of each residue in the sequence, which enables further fine-tuning of the peptide properties. This unique method also provides the use of non-natural amino acids in the novel peptides.

BENEFITS

- Unique approach to the design of antimicrobial peptides
 - Wide use of this platform technology
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APPLICATIONS

- Antimicrobial action (human medicine, veterinary, food industry, agriculture)
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COMMERCIAL OPPORTUNITY

Masaryk University is seeking expressions of interest from industrial partners to take forward the commercial development of this technology.