SYNTHETIC PEPTIDES WITH ANTIMICROBIAL ACTIVITY

Technology Summary

Drug resistance among pathogenic bacteria is on the rise and antibiotics to combat these microbes are becoming limited. New anti-bacterial agents with novel mechanisms need to be developed. With the increasing prevalence of drug resistant bacterial infections, there is a need to develop novel antimicrobial agents that are specific, safe, and effective.

FDA researchers developed a new class of synthetic peptides with antimicrobial activity. The lead candidate identified among this class is EC5. The EC5 peptide has shown efficient binding and selective bactericidal activity against *E. coli* and *P. aeruginosa*, while having little activity against *S. aureus, S. epidermidis, B. cereus,* and *K. pneumonia*. EC5 shows inhibitory activity at low concentrations (MIC 8 µg/ml for *E. coli* and 8-32 µg/ml for *P. aeruginosa*) and appears to bind, to disrupt, and to permeabilize the bacterial cell membranes in a manner similar to Polymyxin B. EC5 also appears to retain its bactericidal activity in the presence of platelets and plasma, while exhibiting little cytotoxic activity or hemolytic activity against red blood cells, in vitro. EC5's profile of activity and low toxicity suggest it may be a favorable candidate for drug development, as an independent or combination therapy and for specific bacterial detection/diagnostics.

Potential Commercial Applications

- Novel antimicrobial therapeutics

Competitive Advantages

- Significant and specific bactericidal activity
- Promising in vitro safety profile

Development Stage: *in vitro* studies

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Publications:

"A peptide derived from phage display library exhibits antibacterial activity against E. coli and Pseudomonas aeruginosa." *PLoS One.* 2013;8(2): PMID: 23409125

Intellectual Property:

United States patent: US 9,243,036 B2, issued 01.26.2016

Australia patent: 2012387696, issued 01.03.2018

Canada patent application: 2882348, filed 08.15.2012

Product Area: Antimicrobials, bacterial infectious disease

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