Multimodal Peptides Derived from Human Cathelicidin
ID# 2025-073

HIGHLIGHTS

- A human-derived inverso peptide with potential broad-spectrum antimicrobial, antibiofilm, and anti-inflammatory properties

OPPORTUNITY

Researchers at the Universities of Alberta, Pennsylvania and Hong Kong have collaborated to design D-GK17, a D-enantiomeric derivative of human cathelicidin LL-37, engineered to resist proteolysis. D-GK17 resists proteolytic degradation and immunogenicity while exhibiting potent antimicrobial, antibiofilm, and immunomodulatory effects against a broad range of bacteria, including antibiotic-resistant strains. *In vivo* tests show the peptide remains stable and effective in clinically relevant environments like serum and wound-associated matrices, killing *A. baumannii* with minimal risk of resistance development. *I*n murine skin abscess and deep thigh infection models, D-GK17 significantly reduces bacterial load over extended periods without observable toxicity. In addition, the results demonstrate that D-GK17 outperforms its L-amino acid counterpart, showing superior efficacy against Gram-positive bacteria, including resistant strains like MRSA and VREfm with lower MIC values.

The global rise of multidrug-resistant pathogens, especially *A. baumannii*, highlights the urgent need for novel therapeutics, but peptide-based antimicrobials face clinical challenges due to rapid degradation, proteolytic susceptibility, and potential immunogenicity. To address these challenges, the incorporation of D-amino acid residues to create inverso peptides offers a promising strategy to enhance peptide stability and therapeutic efficacy. Inverso peptides, synthesized by substituting L-amino acids with their D-enantiomers while maintaining the original sequence, exhibit resistance to proteolytic enzymes due to their altered stereochemistry.

COMPETITIVE ADVANTAGE

- Serum stable, biocompatible, therapeutic window 15x MIC
- Does not promote resistance or cross resistance

STATUS

- Patent pending

INVENTORS

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MORE INFORMATION
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