Skysong Innovations
Advancing the Arizona State University Knowledge Enterprise

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Antibacterial Peptides, Synbodies, and Methods of Discovery

Antibiotic resistance is a worldwide clinical and public health problem, primarily stemming from the overuse of antibiotics. One of the most critical resistant pathogens is Methicillin-resistant Staphylococcus aureus (MRSA), which accounts for over 2,000,000 illnesses and 11,000 deaths each year. MRSA has developed resistance to all beta-lactam antibiotics. Further, new antibiotics that are coming on the market are new derivatives of old antibiotics, so resistance will most likely develop to them as well. One strategy to combat this problem and is currently being researched is to develop agents that sensitize resistant bacteria to antibiotics in current use.

Researchers at the Biodesign Institute of Arizona State University have developed a suite of technologies for the discovery of antibacterial peptides and pathogen-specific bivalent peptides, named synbodies. Filings include an innovative method to discover new antibacterial peptides for both Gram-positive and Gram-negative bacteria; methods to link peptides with pathogen targeting functions to killing moieties; compositions of synbodies with narrow spectrum S. aureus activity; compositions of synbodies that sensitize MRSA to approved beta-lactam antibiotics such as oxacillin. Inventors have demonstrated stand-alone antibacterial activity and a good safety profile for one synbody and in vivo activity in a mouse model of infection.

This portfolio of filings provides a promising opportunity for the continued development of a new generation of treatments for MSSA and MRSA along with methods to discover new compounds active against other pathogens.

Potential Applications

- Starting compounds for hit-to-lead optimization against S. aureus infections
- Discovery and development of new compounds for Gram-positive or Gram-negative infections

Benefits and Advantages

- Represents a new scaffold for optimization and development of new antibiotics

- Can be used with beta-lactam antibiotics to restore their clinical efficacy against resistant bacteria

For more information about the inventor(s) and their research, please see Dr. Diehnelt's directory webpage Dr. Johnston's directory webpage