



Antibacterial Peptides, Synbodies, and Methods of Discovery

AzTE Cases: M11-126L, M14-217L, M15-166L

Inventors

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Intellectual Property

Status:

[Lainson et al – Bioconjug](#)

[Chem 2015](#)

[Diehnelt – Front Microbiol](#)

[2013](#)

[Domenyuk et al – PLoS One](#)

[2013](#)

Intellectual Property

Status:

[US 9,309,298 B2](#)

Additional patents pending

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Invention Description

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