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High-throughput selection of antibacterial therapeutic candidates from random sequence peptides

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Inventors

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Invention Description

Antimicrobial resistance is one of the biggest healthcare challenges. Overuse and misuse of conventional antibiotics along with their broad spectra have triggered development of multi-drug resistant “superbugs”.

Researchers at Arizona State University have developed a novel process for producing alternative therapeutics specific for any particular bacterial pathogen. The bacteria of interest are applied to an array of 10,000 random sequence peptides; peptides that bind are screened for specificity and killing potential. The combination of intracellular staining and outer membrane labeling of bacterial cells allows distinguishing between binding and lytic peptides directly from the array. This permits design of antibacterial peptides that are targeted to specific bacteria without the broad toxicity of naturally-occurring antibacterial peptides.

This process has been demonstrated for *E. coli* O111:B4, *Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus mutans,* and *Bacilus subtilis*, but this system is generalizable to create antimicrobial agents with defined characteristics for any pathogen.

Potential Applications

- High-throughput selection of antibacterial therapeutic candidates specific for any particular pathogen
- Drug discovery

Benefits and Advantages

- High-throughput
- Antibacterial peptides have several advantages
    - relatively simple and inexpensive synthesis
    - faster action due to external position of target molecules
    - few cases of developed resistance
    - selectivity for prokaryotic rather than eukaryotic cells

Intellectual Property Status:

Patent Pending

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