New Antimicrobials for Treating Bacterial Infection and Contamination

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a novel class of antibiotic compounds targeting bacterial cell division.

Overview

The ability of bacteria to adapt and resist antibiotics has led to growing initiatives in the United States and other countries to develop new drugs and modify existing chemical structures to increase their efficacy. A promising strategy for antibiotic development is to disrupt the cellular machinery that bacteria use to divide. Once viewed as a simple process, bacterial cell division is now recognized to be a complex process that involves a large family of proteins that regulate the location and process of division. The protein machinery that is required for bacterial division often is referred to as the divisome, and many of the molecular components of the divisome are essential for cell viability. Compounds that inhibit divisome activity—in particular those that target the protein FtsZ—have been used to treat Gram-positive strains of bacterial pathogens with certain success. New inhibitors of the divisome that are effective against a variety of different microorganisms will introduce a new chapter in antimicrobial agents.

The Invention

UW–Madison researchers have developed a lead compound and synthetic analogs that represent a new class of antimicrobial weapons.

The researchers identified a new family of small molecules from a high-throughput screen that are inhibitors of bacterial cell division. These compounds are toxic to a range of Gram-negative bacteria, including *Escherichia coli*, *Caulobacter crescentus*, *Vibrio cholera*, *Shigella boydii* and *Acinetobacter baumannii*. Compound treatment blocks the assembly and maturation of the divisome in bacteria and leads to the incomplete constriction of the cell division plane. The division process resumes once the compound is washed away.

Applications

- Treating bacterial infections in humans, animals and other subjects
- Stopping bacterial growth and contamination
- Investigating new pharmaceuticals
- Modulating protein activity *in vivo*

Key Benefits

- Effective against a range of Gram-negative bacteria
- Targets an essential, widely conserved protein complex
- Inhibitors are potent and broad spectrum.

Publications

- Eun Y.-J., Foss M.H., Kiekebusch D., Pauw D.A., Thanbichler M., Westler, W.M. and Weibel, D.B. 2012. DCAP: A Broad-Spectrum Antibiotic That Targets the Cytoplasmic Membrane of Bacteria. J. Am. Chem. Soc. 134, 11322-11325.

Tech Fields

- Drug Discovery & Development : Other drug discovery & development
- Research Tools : Protein interactions & function

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or 608-960-9847