Discovery of a Novel Tetronate Antibiotic & Production Method

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BACKGROUND

Antibiotic resistance is a mounting global health crisis that causes more than 1 million deaths annually and contributes to millions more. As antibiotic resistance grows, the need for new antibiotics and methods for treating bacterial infections becomes more urgent. Tetronate polyketide natural products constitute a structurally diverse and biologically important class of secondary metabolites, defined by a tetronic acid (4-hydroxy-2(5H)-furanone) moiety embedded within a polyketide-derived scaffold. Members of this family display a broad spectrum of biological activities, including antibacterial, antifungal, phytotoxic, anticancer, and protein tyrosine phosphatase inhibitory effects. There is a need for further identification and development of antibiotic compounds, including tetronate polyketide small molecules and derivatives, that can address infections caused by drug-resistant bacteria.

DESCRIPTION

Researchers at the University of California, Santa Barbara and Tufts University School of Medicine have discovered roridic acid, a tetronate polyketide antibiotic with potent and selective activity against Gram-positive bacterial pathogens, including drug-resistant strains. This technology involves the genome-guided discovery and biosynthesis of roridic acid, a novel tetronate polyketide antibiotic produced by a fungal biosynthetic gene cluster. Roridic acid demonstrates strong antibacterial activity against a range of aerobic and anaerobic Gram-positive pathogens such as Clostridioides difficile, methicillin-resistant Staphylococcus aureus, and vancomycin-resistant Enterococcus faecalis. Additionally, it exhibits selective efficacy comparable to vancomycin but with a distinct mode of action that spare beneficial gut microbiota like E. coli. Notably, roridc acid showed no detectable cytotoxicity toward mammalian cells highlighting its potential as a promising antibiotic lead.

ADVANTAGES

- Potent antibacterial activity against drug-resistant Gram-positive pathogens
- Selective narrow-spectrum activity, reducing impact on beneficial microbiota
- Genome mining enables targeted discovery of novel antibiotics
- Synthetic routes allow production of analogues for structure-activity optimization
- Effective under both aerobic and anaerobic conditions
- Offers new intellectual property claims with unique mode of action

APPLICATIONS

- Pharmaceutical development of new antibiotics for multidrug-resistant bacterial infections

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OTHER INFORMATION

KEYWORDS

antibiotics, bacteria, bacterial, acid, drugs, drug development, antibacterial

CATEGORIZED AS

- **Medical**
  - Therapeutics

RELATED CASES

2026-818-0

- Therapeutics targeting Clostridioides difficile infections and other Gram-positive pathogens
- Use in clinical settings requiring narrow-spectrum antibacterial agents to preserve microbiome health
- Research and development of antibiotic analogues for improved potency and safety
- Natural product-based antibiotic discovery and drug candidate screening platforms

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Biocatalytic Asymmetric Synthesis Of Heterocyclic Alpha, Alpha-Disubstituted Amino Acids

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