

Novel HPPK (Bacterial Protein) Inhibitors for Use as Antibacterial Agents

Summary (1024-character limit)

Researchers at the National Cancer Institute (NCI) have developed several novel small-molecule inhibitors directed against HPPK, a bacterial protein, as potential antimicrobial agents. The NCI seeks co-development partners or licensees to further develop these novel small-molecule HPPK inhibitors as broad-spectrum bactericidal agents.

NIH Reference Number

E-276-2016

Product Type

- Therapeutics

Keywords

- Antibiotic, Bactericidal, Bacterial Protein, Broad Spectrum, Biodefense, Folate Biosynthesis, Small Molecule, HPPK, Ji

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Research and development leading to the discovery of novel antibiotics has waned in recent years. At the same time, the emergence and spread of antimicrobial resistance has compounded the global danger to human health from bacterial infections.

The bacterial protein 6-hydroxymethyl-7,8-dihydropterin pyrophosphokinase (HPPK) is a key enzyme in the folate biosynthetic pathway. This pathway is essential for bacteria and microorganisms but is absent in mammals – making it an attractive target for antibiotics. HPPK is a novel target for antibiotics as none of the antimicrobial agents currently on the market or in later stage development are HPPK inhibitors.

Researchers at the NCI have developed several novel small-molecule inhibitors directed against HPPK for potential use as antimicrobial agents. The compounds described in this invention present strong

binding affinity for HPPK with K_d values as low as 50 nM.

The NCI seeks co-development partners or licensees to further develop these novel small-molecule HPPK inhibitors as broad-spectrum bactericidal agents.

Potential Commercial Applications

- Potential use as a broad-spectrum or narrow-spectrum antibiotic
- Potential use in antibacterial consumer products
- Potential use as a biodefense therapeutic
- Potential use for parasitic diseases, such as malaria
- Increases in the worldwide prevalence of persistent and infectious diseases and the promise of new antibiotics to address a broad spectrum of organisms are driving growth of the global market
- Growing populations and increasing healthcare expenditures are key factors driving growth of the global market

Competitive Advantages

- HPPK represents a novel target for these first-in-class high-affinity antibacterial compounds
- Lack of the folate biosynthetic pathway in humans suggest anti-infectives targeting this pathway might be well-tolerated

Inventor(s)

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Development Stage

- Discovery (Lead Identification)

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/406,610 , Filed 11 Oct 2016
- **PCT:** PCT Application Number WO2018071531A1, Filed 19 Apr 2018

Therapeutic Area

- Infectious Diseases