More Potent UGM Inhibitors for Treating Tuberculosis and Other Microbial Infections

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WARF: P140379US02

View U.S. Patent No. 9,708,344 in PDF format.

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a set of compounds that may combat tuberculosis and other diseases.

OVERVIEW

Mycobacterium tuberculosis, the causative agent of tuberculosis, is responsible for eight million human infections and two million deaths worldwide each year. *M. tuberculosis* infections can be treated by antibiotics, but resistant strains are on the rise. To combat this resistance, novel targets for antimicrobial drugs are needed.

An enzyme known as uridine 5`-diphosphate (UDP) galactopyranose mutase, or UGM, is one such target. UGM plays a key role in the formation of UDP-galactofuranose (Galf), which is present in many pathogens and is an essential cell wall component in mycobacteria like *M. tuberculosis*. UGM is a particularly attractive drug target because no comparable enzyme exists in humans. Additionally, current tuberculosis drugs do not target UGM, so compounds that block UGM should be effective against drug resistant strains.

THE INVENTION

UW–Madison researchers and collaborators have identified a potent set of UGM inhibitors that may help fight tuberculosis and other diseases caused by microbial infections. The compounds contain a bicyclic triazolo thiadiazine core with diversified aromatic substituents. They were identified by virtually screening a database of nearly five million commercially available compounds.

The molecules inhibit the growth of microorganisms that depend on UGM to incorporate Galf residues. They also diminish the virulence of pathogenic microorganisms, such as *M. tuberculosis*, *M. smegmatis* and *Klebsiella pneumonia*, that rely on UGM.

THE WARF ADVANTAGE

WARF: A Leader in Technology Transfer Since 1925

Since its founding as a private, nonprofit affiliate of the University of Wisconsin–Madison, WARF has provided patent and licensing services to UW–Madison and worked with commercial partners to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

The University of Wisconsin and WARF – A Single Location to Accelerate Translational Development of New Drugs

UW–Madison has the integrative capabilities to complete many key components of the drug development cycle, from discovery through clinical trials. As one of the top research universities in the world, and one of the two best-funded universities for research in the country, UW–Madison offers state-of-the-art facilities unmatched by most public universities.

These include the Small Molecule Screening Facility at the UW Comprehensive Cancer Center; the Zeeh Pharmaceutical Experiment Station, which provides consulting and laboratory services for developing formulations and studying solubility, stability and more; the Waisman Clinical Biomanufacturing Facility; the Wisconsin Institute for Medical Research, which provides UW–Madison with a complete translational research facility; and the innovative, interdisciplinary Wisconsin Institutes for Discovery, home to the private, nonprofit Morgridge Institute for Research and its public twin, WID, part of the university's graduate school. The highly qualified experts at these facilities are ready to work with you to create a library of candidates for drug development.

APPLICATIONS

- Development of novel therapeutics for diseases, such as tuberculosis, that are caused by microbial infections
- Research tools

KEY BENEFITS

- Provides potent compounds that may result in therapeutics for tuberculosis and other diseases caused by *Mycobacterium sp.*
- Effective against prokaryotic and eukaryotic microorganisms
- May be useful in combination with other antibiotics
- Should be effective against drug resistant strains

STAGE OF DEVELOPMENT

In vitro and cell culture data is promising. The most potent of the compounds display cell-killing not only of lab strains of mycobacteria, but also the highly pathogenic *M. tuberculosis* strain H37Rv.

ADDITIONAL INFORMATION

Related Technologies

WARF reference number P08351US describes a set of novel small molecule inhibitors of UGM that may be useful in the treatment of tuberculosis and other diseases caused by microbial infections.

Tech Fields

Pharmaceuticals & Vitamin D - Antibacterials

CONTACT INFORMATION

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