New Drugs for Malaria and Bacterial Infections

Published date: Aug. 14, 2019

Technology description

New anti-infectives are required now more than ever as resistance to existing drugs increases in prevalence. Enzymes unique to bacteria or parasites are potential drug targets with minimal side effects because they are not present in humans. One such source of potential drug targets is the isoprenoid biosynthesis pathway. Many pathogenic bacteria and malaria parasites use isoprenoids in their cell walls, to protect against the human immune system, and for other functions. This pathway is not present in humans and thus is an excellent target for new anti-infective drugs.
Scientists from the University of Illinois at Urbana-Champaigns Departments of Chemistry and Biophysics have identified a class of novel chemical entities that are capable of inhibiting two key enzymes, GcpE and LytB, in the isoprenoid biosynthesis pathway. These compounds are able to inhibit the isoprenoid biosynthetic pathway at concentrations far lower than any other known inhibitors and have the potential to treat a wide-range of infectious disease caused by both bacteria and malarial parasites. In addition, it may be possible to use these compounds for the treatment of cancers, via immune system activation.
DESCRIPTION/DETAILS
This invention includes a class of novel chemical entities composed of similar geometries and bonds. They inhibit through a unique organometallicinteraction that has not been previously described.

Application area

Currently, the compounds are being evaluated for their ability to act as:
o Broad spectrum anti-infectives
o Cytotoxic cancer drugs
Other compounds produced using similar chemistry may have a wide range of medical applications

Advantages

Novel Mechanism: These compounds act on the isoprenoid pathway using a chemical interaction that has not been previously described. Continued work on these compounds is designed to identify new applications of this interaction, beyond anti-infectives.

Institution

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