Antimicrobial Agents for the Treatment of Multidrug-Resistant Bacteria Infections

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Technology description

The invention provides synthetic compounds, methods of use, and strategies to design novel compounds that are bacteria-specific and resistant to protease activity.
The emergence of multidrug-resistant (MDR) bacteria causes a growing problem worldwide, particularly in the hospital setting where nosocomial infections affect 5 to 10% of patients per year.
A team at Cornell looked at alternatives to traditional antibiotics and developed a rapid and efficient method for the assembly of synthetic sequence-defined oliothioetheramides (oligoTEAs) that mimics properties and antibacterial activities of antimicrobial peptides (AMPs) by tuning molecule hydrophobicity and charge.
Using this approach, the team synthetized novel antimicrobial agents then designed strategies to render their novel compounds active in specific bacterial cells as well as to resist to bacterial proteases. Proteases are known to participate in the regulation of resistance to antimicrobials.
So far, the team has identified four promising compounds that have been the testedin vitroonMRSA,A. baumannii,K. pneumonia,B. subtilis,E.coli, andUSA300strains andin vivoon mice infected by MRSA strains. The resulting minimum inhibitory concentration (MIC) of each compounds had ranged from 0.5-2 µg/ml. Moreover, these compounds have showed little cytotoxicity.
These compounds can be good alternatives to other compounds that may induce a high incidence of nephrotoxicity in the treatment of MDR Gram-negative bacteria. Studies are continuing.

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