

BIS-cyclic Guanidine Compounds as Novel Anti-bacterial Agents

Researchers at the University of South Florida and Torrey Pines have synthesized novel compounds showing anti-bacterial activity against ESKAPE pathogens.

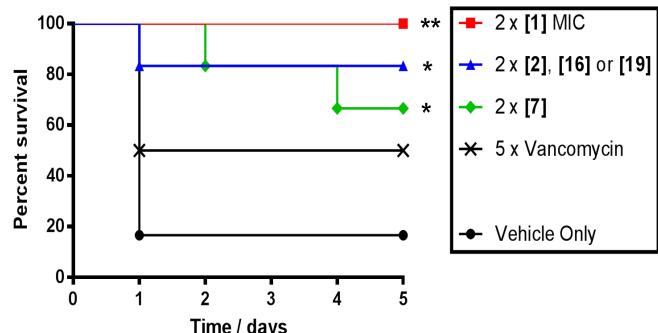
Bacterial diseases remain the second-leading cause of human mortality worldwide, with nearly a quarter of those deaths resulting from pathogens for which there are no treatment options remaining. Additionally, millions of infections originating in hospitals occur every year from multidrug resistant organisms. It is apparent that there is a dire need for new anti-bacterial compounds that effectively combat easily mutated and antibiotic resistant bacteria. Of particular importance is combatting the six ESKAPE pathogens, which currently cause around two-thirds of all US nosocomial infections. These bacteria have effectively escaped the ability to be treated by existing drugs.

By employing synthetic combinatorial libraries, our inventors have synthesized a class of bis-cyclic guanidine compounds that were found to have anti-bacterial activity against all six ESKAPE human pathogens. The mechanism of action by which these compounds kill the pathogens is currently being explored, but they may function by inducing membrane stress and by interfering with the DNA repair pathways of the organisms. This invention shows a promising efficacy in combating bacterial infections, while showing limited toxicity to human cells. The compounds exhibit potent anti-biofilm properties as well.

ADVANTAGES:

- **Low toxicity to human cells**
- **Potent anti-biofilm properties**
- **High efficacy against ESKAPE pathogens**

Antimicrobial Agents Effective Against ESKAPE Pathogens



*Front Runner Bis-cyclic Guanidines are Efficacious During In Vivo Infection. Mice were I.P. Infected With a Lethal Dose of *S. aureus*. After 1h, Mice Were Injected With Either Front-Runner Bis-cyclic Guanidines (Red, Blue, and Green), Vancomycin (Positive Control) or Vehicle Alone (Negative Control)*