Researchers at the University of South Florida have designed a series of small molecular antibacterial agents that manifest antibacterial activity against several resistant strains of gram positive and gram negative bacteria.

Antibiotic resistance is an ever-increasing problem in global public health. Several multidrug-resistance bacteria have been reported to be a major cause of hospital and community-acquired infections. Infections due to these resistant microbes have caused immense health care costs and have led to far worse clinical outcomes including death. Thus, there is an urgent need for a class of antimicrobials that can inhibit the menace of multidrug resistance.

Scientists at USF have designed novel bis-cyclic guanidine compounds that kill bacteria by compromising their cell membranes. Their mechanism of action is analogous to that of HDPs (host-defense peptides) which have recently surfaced as an alternative approach to fight bacterial resistance. Furthermore, these compounds exhibited excellent in vivo activity in methicillin-resistant Staphylococcus aureus (MRSA) infected mice.

Even after 14 consecutive passages of bis-guanidines, MRSA did not show signs of developing resistance against these compounds. It could even penetrate the normally drug resistant biofilm. Thus, indicating that bis-cyclic guanidines can act as potent membrane-active antibacterial agents, which can effectively kill multidrug resistant bacteria. This technology manifests an appealing class of antibiotic agents that can lead the fight against hospital and community-acquired infections.

**ADVANTAGES:**

- Potent antimicrobial activity against resistant bacteria
- Effective on both gram positive and negative bacteria
- Can penetrate bacterial biofilm
- Combat emerging threats of drug-resistant bacteria

**Potent Inhibition of Antimicrobial Resistance via Bis-Cyclic Guanidines**

**Figure Shows MRSA and E. Coli Gain No Increase in Resistance After Repeated Exposure to Bis-Cyclic Guanidines**

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