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Tetrazole-Based Scaffolds as Broad-Spectrum Beta-Lactamase Inhibitors

Researchers at the University of South Florida have discovered tetrazole-based derivatives as broad-spectrum beta-lactamase inhibitors.

Beta-lactam antibiotics like penicillins, carbapenems, and monobactams inhibit bacterial growth by targeting the cross-linking of the bacterial cell wall, which results in cell death. Consistently throughout history, after an antibiotic is approved for clinical use, resistance emerges just a few years later. Along with the current healthcare issue of hospital acquired infections on the rise, the discovery of new antibiotics are in high demand.

The production of beta-lactamase is one of the main resistance mechanisms against beta-lactam antibiotics.

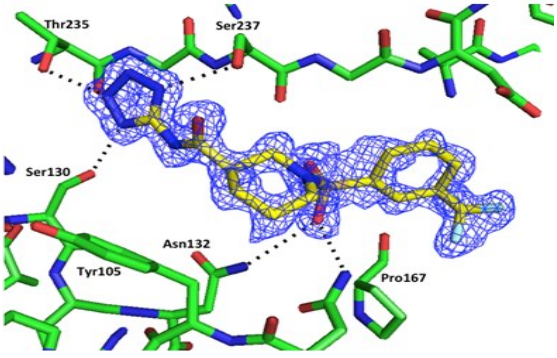
Beta-lactamases are of different classes based on their mechanism of action and amino acid similarity. These variations make countering bacterial resistance especially challenging because serine and metallo beta-lactamases use different catalytic mechanisms, which may not be inhibited by only one mechanism-based inhibitor, the focus of many drug discovery programs targeting beta-lactamases.

Our researchers have discovered tetrazole-based compounds that can actively inhibit beta-lactamases. The tetrazole-based inhibitors show inhibition against different classes of the enzyme targeting the most clinically problematic beta-lactamases and can therefore be combined with a beta-lactam antibiotic to target drug resistant bacterial infections due to beta-lactamase production. This scientific breakthrough represent a substantial gain in the fight against bacterial infections.

ADVANTAGES:

- **Highly Effective**
- **Inhibit Multiple Targets**

Potent β-Lactamase Inhibitor



High complementarity displayed in the binding of Tetrazole compound and active site of the enzyme

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