

Active Macrolide Antibiotic Compounds Against Pathogens

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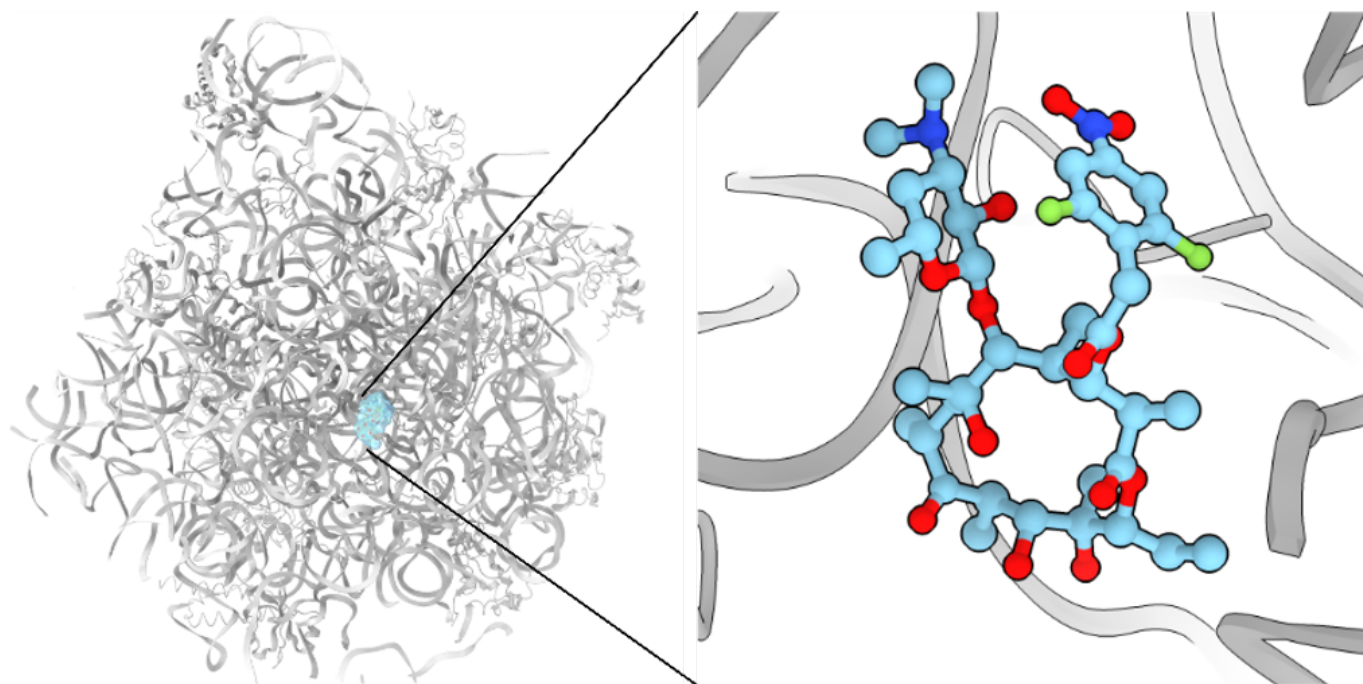
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Overview

The growing threat of multidrug-resistant bacteria, such as *S. aureus* and *E. coli*, underscores the urgent need for next-generation antibiotics. This technology introduces a novel class of macrolide antibiotics, acylides, specifically engineered to overcome resistance mechanisms limiting current macrolide efficacy. Structurally optimized for enhanced ribosomal binding and antibacterial potency, acylides demonstrate robust activity in both in vitro and in vivo models and show proven stability in human serum, supporting their potential for clinical translation.

Applications

- Treatment of infections caused by drug-resistant *Staphylococcus aureus* and *Escherichia coli*
- Development of new antibiotics for resistant bacterial infections
- Use in clinical settings where standard antibiotics fail
- Platform for designing next-generation macrolide-based therapeutics



Depiction of the macrolide-binding pocket within the upper region of the nascent peptide exit tunnel of the large ribosomal subunit (left), accompanied by a close-up of the bound macrolide ligand (rendered in light blue) within its ribosomal binding site (right).

Differentiation

- Novel structure with reduced resistance potential
- Broad activity against both Gram-positive and Gram-negative bacteria
- Demonstrated *in vitro* and *in vivo* efficacy
- Improved ribosomal binding

Development Stage

Chemical synthesis completed for multiple compound variants. Ribosome-complex structural analysis performed. *In vitro* and *in vivo* antibacterial activity was demonstrated.

Additional structural studies are ongoing.

References

<https://pubmed.ncbi.nlm.nih.gov/34750269/> [1]