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Abstract

New potent staphylococcal biofilm inhibitors as valuable anti-virulence compounds in the struggle against antibiotic resistance

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Abstract:

Three different classes of heterocyclic compounds 1, 2 and 3were synthesized and evaluated for their capability to inhibit biofilm formation of the Gram-positive bacterial reference strainsStaphylococcus aureus ATCC 25923, S. aureus ATCC 6538 and Staphylococcus epidermidis ATCC 12228, andthe Gram-negative strains Pseudomonas aeruginosa ATCC 15442 and Escherichia coli ATCC 25922. Many of these new compounds, showed potent anti-biofilm activity exhibiting BIC50 lower than 10 µg/ml, and in some cases lower than 1µg/ml. All compounds elicited higher potency toward Gram-positive strains, showing a typical anti-virulence profile. In fact, the new derivatives did not interfere with bacterial vital processes (MIC > 100 µg/ml) but they inhibit the bacterial biofilm formation, that is considered one of the most relevant bacterial virulence factor. The 1,2,4-oxadiazole topsentinanalogs3proved toact by inhibiting the transpeptidase-Sortase A, interfering, consequently, with the bacterial adhesion, which represents the first step of biofilm formation and bacterial pathogenesis.

Biography:

Stella Cascioferrogot her Ph.D. in Medicinal Chemistry in 2004 at the University ofPalermo. In 2004, she joined the Physical and Theoretical ChemistryLaboratory at the University of Oxford. Currently, she is researcher at theUniversity of Palermo, Italy. She is the author of 61 scientific paperspublished in peer reviewed international journals of medicinalchemistry.

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