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High-Throughput Screening identifies novel small-molecule compounds that enhance aminoglycosides activity against bacteria

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Abstract

Aminoglycosides is one of the oldest class of antibiotics. Its history started with the discovery of Streptomycin, the first-in-class antibiotic, by Selman Waksman in 1944. However, its usefulness was highly eroded by the emerging resitance in recent years. The conventional strategy of developing novel antibiotics leads to selection of resistant strains, rendering new drugs ineffectiveness. Thus, rejuvenating the therapeutic potential of existing antibiotics offers a rational yet novel strategy. Using a cell-based screen of 50,240 small-molecule compounds, we identified a potent compound with low cytotoxicity, SA-558, that potentiate gentamicin activity against Vancomycin-intermediate S. aureus Mu3. SA-558 potentiates activity of different members of antibiotics in the class of aminoglycosides, but not kasugamycin against S. aureus Mu3. The SA-558 gentamicin-potentiating activity is generally observed in gram-positive bacteria but not in gram-negative bacteria. Resistance towards SA-558 activity is difficult to arise. Here, we demonstrated that SA-558, a novel compound, is of high potential to rejuvenate the potency of aminoglycosides, one of the oldest class antibiotics, for clinical application.

Biography:

Venice is in the fourth year of her PhD study at Univeristy of Hong Kong. She graduated from the Bachelor of Biomedical Sciences (BbiomedSc) with first class honour and started her PhD study with the entrance scholarship, Jessie Ho Memorial Postgraduate Scholarship in 2016.

Speaker Publications:

1. Agudelo-Restrepo, Manuela & Hernández-Quesada, Martha & Sanabria-Duran, Edinson & Uribe-Soto, Sandra & Ortiz-Reyes, Adriana & Romero-Tabarez, Magally. (2020). Assessment of mosquito insecticidal activity of bacterial extracts produced by Colombian strains. Access Microbiology. 2. 10.1099/acmi. ac2020.po0037.

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