

Expanding the Scope of Antimicrobial Peptides: Anti-infectives and Beyond

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Introduction: The emergence and spread of multi-drug (MRD) resistant bacteria have initiated intense search for new antibiotics. Infections caused by Gram negative bacteria are even more difficult to remove due to low efficacy of several frontline existing antibiotics (vancomycin, novobiocin etc). The outer membrane-LPS protect Gram negative bacteria that limit entry of antibiotics to the cellular targets.

Purpose: We are investigating molecular mechanism of outer membrane-LPS disruption of potent and clinically relevant AMPs.

Conclusions: (i) NMR structure and interactions of thanatin, an insect derived cell agglutinating AMP, (ii) discovery of novel AMPs of human furin prodomain and (iii) preclinical development of de-novo designed b-boomerang cyclic peptide. In addition, we propose an expanding scope of multifunctional AMPs in inhibiting protein amyloids.

Biography:

Prof Surajit Bhattacharyya has been an Associate Professor, at the School of Biological Sciences, Nanyang Technological University. Prof. Bhattacharyya received his PhD degree from Indian Institute of Science, Bangalore, India and carried out Post-doctoral research in Biotechnology Research Institute, Montreal, Canada. His research interests include Structural and Chemical Biology using NMR spectroscopy as the primary technique. His group has done significant research in the area of antimicrobial peptides and cell adhesion proteins, integrins and more recently de novo designing of heme b-sheet proteins and published over 80 top quality international journal papers. Prof Bhattacharyya is a Fellow of the Royal Society of Chemistry and an Overseas Fellow of the Royal Society of Medicine.

Publication of speakers:

1. Rachita Dash and Surajit Bhattacharjya. (2021). Thanatin: an emerging host defense peptide with multiple mode of actions. *Int J Mol Sci.* 22(4):1522.
2. Surajit Bhattacharjya & Suzana Straus. (2020). Design, engineering and discovery of novel α -helical and β -boomerang antimicrobial peptides against drug resistant bacteria. *Int J Mol Sci.* 21(16):5773
3. Areetha D'Souza, Xiangyang Wu, Edwin Kok Lee Yeow and Surajit Bhattacharjya. (2017). Designed heme-cage beta-sheet mini-proteins. *Angew. Chem. Int. Ed.* 56, 5904-5908.

Full name of webinars, dates,

Webinar on Nano materials. March 30, 2021

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