



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Roll Number : **156122018**

Programme of Study : **Ph.D.**

Thesis Title:
“Design, Synthesis and Mechanistic Studies of Cationic Antimicrobial Peptides”

Name of Thesis Supervisor(s) : **Dr. Sunanda Chatterjee**

Thesis Submitted to the Department/ Center : **Chemistry**

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Key words for description of Thesis Work : **Cationic antimicrobial peptides (AMPs), Membranolytic AMPs, Experimental and computational approaches**

SHORT ABSTRACT

The thesis entitled “Design, Synthesis and Mechanistic Studies of Cationic Antimicrobial Peptides” deals with the rational design of short, cationic antimicrobial peptides (AMPs) with broad spectrum activity towards ESKAPE pathogens and fungi. AMPs are especially relevant as an alternative therapeutic class of molecules, to the conventional antibiotics in combating the microbial infections, given the alarming increase in the antibiotic resistance over the recent years. Detailed biological activity of these AMPs have been studied against microbial cells/mammalian cells individually or presence of both. A detailed mechanistic investigation has been carried out using various spectroscopic (Fluorescence, CD, NMR)/microscopic (FESEM, TEM, CLSM) and biophysical studies (dye leakage assays, ITC). Molecular Dynamics simulations have been performed to understand the AMP- membrane mimic interactions in atomic details. The objective of the thesis on one hand has been the development of small cationic economically viable AMPs, which might be able to circumvent the conventional drawbacks of the existing AMPs and be commercially relevant, and to understand the basics of the mechanism of action of the AMPs which might lead to design of better and more effective AMPs in the future, on the other.