



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

In this thesis, we have designed and synthesized small peptide based supramolecular gels (hydrogels/organogels) for utilizing them in varied applications in both biomedical and non-biomedical sectors. We also investigated the self-assembly mechanisms to understand the role of non-covalent interactions in their gelation behavior through several spectroscopic and microscopic techniques. The peptides used for the constitution of the gels vary from small hydrophobic and highly aromatic peptides to salt-tolerant and protease-resistant cationic antimicrobial lipopeptides. The developed hydrogels have been employed in diverse biomedical applications like drug release platform, and adjuvant for potentiating antibiotics against resistant microbes and materials to prevent the growth and propagation of biofilms. The organogels, on the other hand, have been employed for water remediation by removal of spilled oil and dyes, development of conducting material, and immobilization cum stabilization of quantum dots. In addition to demonstrate their applications, we have thoroughly characterized their properties like thermostability, reversibility, mechanical stability, phase-selective gelation ability and morphology.