



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.
Thesis Title : Development of Small Peptide Amphiphile Based Supramolecular Hydrogels For Various Potential Applications
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SHORT ABSTRACT

The thesis “**Development of small peptide amphiphile based supramolecular hydrogels for various potential applications**” deals with the development of new short peptide amphiphile based hydrogels with the help of different aromatic functional groups.

Chapter 1 is a brief introduction of peptide-based hydrogels with up to date literature review.

Chapter 2 describes the hydrogelation mechanism of a peptide amphiphile (**PA-1**) conjugated to naphthalene diimide (NDI) and its application in both cell imaging as well as intracellular pH sensing.

Chapter 3 deals with another naphthalene diimide (NDI) appended peptide amphiphile (**PA-2**) and its application in sensing the VOC with the help of carbon quantum dots.

Chapter 4 describes the untraditional unique behaviors of a pyrene containing short tri-peptide (**PyKC**) based hydrogel.

Chapter 5 contains the potential application of **PyKC** hydrogel in the protection and retention of enzymes’ geometrical conformation and activity respectively from different extreme conditions like denaturants, temperature, acid, and base.