

	INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI SHORT ABSTRACT OF THESIS	
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Programme of Study	: Ph.D.	
Thesis Title: Development of Synthetic Anionophores with Potential Prospects in Therapeutic Applications		
Name of Thesis Supervisor(s)	: Prof. Debasis Manna	
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SHORT ABSTRACT

The thesis entitled “Development of Synthetic Anionophores with Potential Prospects in Therapeutic Applications” elucidates a succinct description of numerous new classes of anionophores with promising therapeutic potential. Within this thesis, the recognition, transmembrane transport, and the possible therapeutic prospects are reported. The thesis has been divided into five chapters based on the adept experimental results which were carried out during the entire research period.

Chapter 1 conveys a brief discussion on the importance of anion transportation to maintain normal physiological functions and how anionophores could be used as a therapeutic agent for cystic fibrosis, cancer, and the antibacterial field. Compact literature on anion transporting molecules and their numerous therapeutic potentiality have been also conversed.

Chapter 2 reports a series of bis-thiourea-based diphenylethylenediamine (DPEN) scaffolds with promising anion recognition as well as transport ability across the model membrane. The detailed transport mechanism and the correlations with apoptosis using a number of proficient experiments have also been pointed out.

Chapter 3 describes natural product-based anionophores, which were semi-synthetically derived from the well-known anti-malarial drug quinine. A comprehensive study on anion recognition, transportation at different pH has been discussed. In addition, a thorough investigation on anti-proliferative activity both *in vitro* and *in vivo* is also covered.

Chapter 4 illuminates glutathione (GSH) responsive proanionophore. A concise study on anion recognition, transport, and biological studies of sulphonium-based water-soluble derivatives is discussed.

Chapter 5 deals with a novel responsive strategy with nitroreductase (NTR) enzyme where transport, diagnosis, and possible bio imaging ability of fluorescent-based TPE molecules have been well conversed