Object of Present Work

This work initiated in 1998 was primarily aimed for studies and development of nanocapsular drug delivery systems using bioirrodable polymer materials. Widely used antineoplastic drug Methotrexate was chosen as the model drug and bovine serum albumin (BSA) and alginate were the polymer materials under investigation.

Generalized and upgradeable nanocapsulation techniques were studied to i) Prepare suitable Methotrexate loaded nanocapsules, ii) Explore physicochemical parameters like size distribution, drug loading efficiencies and drug release kinetics of loaded nanocapsules, iii) Understand the mechanism of drug release kinetics from the drug loaded nanocapsules and iv) to Study *in vivo* tissue distribution of the prepared nanocapsules.

Different preparation methodologies were investigated using various drug polymer combinations. Biodegradable and biocompatible materials were generally used to produce drug loaded nanocapsules. Drug loading was confirmed and the release kinetics was studied in HPLC analysis. Particle nature and size distribution was evaluated in PCS and TEM. The drug release kinetics was mathematically modeled to understand the *in vitro* drug release profile. Selected Methotrexate loaded nanocapsules prepared were subjected to *in vivo* tissue biodistribution studies in animal models.