

Development of Nanostructured Hydrogel for Spatial and Temporal Controlled Release of Active Compounds

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Abstract : Controlled drug delivery technology represents one of the most rapidly advancing areas of science in which chemists and chemical engineers are contributing to human health care. Such delivery systems provide numerous advantages compared to conventional dosage forms including improved efficacy, and improved patient compliance and convenience. Such systems often use synthetic polymers as carriers for the drugs. As a result, treatments that would not otherwise be possible are now in conventional use. The role of bilayered vesicles as efficient carriers for drugs, vaccines, diagnostic agents and other bioactive agents have led to a rapid advancement in the liposomal drug delivery system. Moreover, the site avoidance and site-specific drug targeting therapy could be achieved by formulating a liposomal product, so as to reduce the cytotoxicity of many potent therapeutic agents. Our project focuses on developing and building hydrogel with nanoinclusion of liposomes loaded with active compounds such as proteins and growth factors able to release them in a controlled fashion. In order to achieve that, we synthesize several liposomes of two different phospholipids concentrations encapsulating model drug. Then, formulating hydrogel with specific mechanical properties embedding the liposomes to manage the release of active compound.

Keywords : controlled release, hydrogel, liposomes, active compounds

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