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(57) Abstract :

Abstract Silk Fibroin nanoparticle for targeted drug delivery The present invention relates to a targeted nanotherapeutic system, comprising silk fibroin-based nanoparticles functionalized for receptor-mediated drug delivery. Silk fibroin, a biocompatible and biodegradable protein polymer, enables controlled drug release and high drug-loading capacity. The invention provides a dual drug-loaded nanoparticle system comprising gemcitabine and 5-fluorouracil co-encapsulated within the silk fibroin matrix to achieve anticancer activity through inhibition of DNA synthesis pathways. The nanoparticles are surface-functionalized with a targeting ligand, preferably a peptide such as GE11, enabling selective binding to epidermal growth factor receptors (EGFR) overexpressed on cancer cells.

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