

(54) Title of the invention : NANOPARTICLE-ENHANCED DRUG DELIVERY SYSTEM FOR PRECISION TARGETING AND SUSTAINED RELEASE OF THERAPEUTIC BIOPHARMACEUTICALS

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(57) Abstract :

NANOPARTICLE-ENHANCED DRUG DELIVERY SYSTEM FOR PRECISION TARGETING AND SUSTAINED RELEASE OF THERAPEUTIC BIOPHARMACEUTICALS ABSTRACT A nanoparticle-enhanced drug delivery system (100) for precision targeting and sustained release of therapeutic biopharmaceuticals is disclosed. The system (100) comprises nanoparticles (102) with a core-shell structure, where the core encapsulates a biopharmaceutical agent, and the shell includes a biodegradable polymer for controlled release. A targeting ligand (104) is bound to each nanoparticle surface, facilitating receptor-specific delivery to target cells. A stabilizing agent (106) coating surrounds the nanoparticles, preserving bioactivity and preventing premature agent release. Additionally, a release modulator (108) within the shell adjusts the release rate based on environmental triggers, enabling site-specific and sustained biopharmaceutical delivery. This system offers enhanced bioavailability and targeted therapy, making it suitable for applications such as cancer treatment, where precise drug delivery and sustained release are critical. FIG. 1

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