

Method To Fabricate Biopolymer-Based Switchable Nano Particles Fororal Delivery Of anti-Cancer Drugs

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ABSTRACT

A method (100) to fabricate biopolymer-based switchable nanoparticles for oral delivery of anti-cancer drugs may be provided. The anti-cancer drugs may be both hydrophobic and hydrophilic in combination. The method (100) may include formation (110) of thiolated Stearic acid (TSA) (102) and the formation (120) of thiolated chitosan (TCS) (103). Further, the method (100) may include combining (130) thiolated Stearic acid (TSA) and thiolated chitosan (TCS) to obtain biopolymer-based switchable nanoparticles (104). Further, hydrophobic (105) and hydrophilic (106) anti-cancer drugs may be encapsulated (140) in fabricated biopolymer-based switchable nanoparticles. The fabricated biopolymer-based switchable nanoparticles may be disulfide crosslinked biopolymer.

KEY APPLICATION AREAS

1. Cancer Drug Delivery.
2. Nanomedicine & Nanotechnology.
3. Oral Drug Delivery Systems.
4. Targeted Cancer Therapy.
5. Biopolymer-Based Nanocarriers.
6. Combination Chemotherapy.

POTENTIAL USES

- 1.Oral co-delivery of hydrophilic (DOX) and hydrophobic (Curcumin) anti-cancer drugs using switchable nanoparticles.
- 2.Targeted colon cancer treatment through redox-responsive drug release at the tumor site.
- 3.Combination chemotherapy with synergistic drug action, improving efficacy while reducing toxicity.
- 4.Controlled and sustained drug release with minimal drug leakage under normal physiological conditions.
- 5.Colon-specific oral delivery with high cellular uptake and selective accumulation in colon tissue.
- 6.Biocompatible, crosslinker-free nanoparticle platform for delivering multiple therapeutic agents.
- 7.Platform technology adaptable for oral delivery of other hydrophilic and hydrophobic therapeutic drugs.