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Micro-aggregation of Fibronectin Protein via Antibodies & Liposomes to Boost Anti-Cancer Cargo Uptake in Bladder Tumor Cells

A novel drug delivery strategy utilizes the fibronectin attachment protein (FAP) and microaggregation to promote rapid, high-affinity internalization of anticancer cargo into bladder tumor cells, even in the bladder's acidic environment.

Bladder cells are well protected and particularly difficult for topically applied therapeutic agents to penetrate. Constant urine influx and periodic voiding of the bladder further limits the effectiveness of therapy. Currently, instillation of live Mycobacterium bovis Bacillus Calmette-Guerin (BCG) is most commonly used to increase penetration of therapeutic agents in the treatment of bladder cancer; however, administration of BCG is associated with high local morbidity and the potential for systemic infection. There is a need for the development of safer, less toxic approaches to administer therapy.

Researchers at Purdue University have developed an effective strategy to promote the internalization of anticancer cargo using the fibronectin attachment protein (FAP) from BCG to gain admittance to bladder tumor cells. FAP binds strongly to targets on the surface of bladder tumor cells; it is subsequently internalized along with the chemotherapeutic cargo. To combat the transitory nature of bladder contents, an antibody-induced microaggregation strategy is employed that promotes rapid internalization of FAP by bladder tumor cells. Furthermore, FAP binding on the surface of bladder tumor cells is resistant to the acidic environment of the bladder. These properties make it an excellent foundation for the design of more effective, less toxic bladder cancer therapies.

Advantages:

-High-affinity targeting of bladder tumor cells

-Rapid internalization

Technology ID

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Category

Biotechnology & Life Sciences/Cell & Gene Therapy Platforms

Pharmaceuticals/Drug Delivery & Formulations

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-Binding is resistant to the acidic environment of the bladder

Potential Applications:

-Medical/Healthcare

-Pharmaceuticals

-Drug development

-Biotechnology

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Intellectual Property:

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