Internalization of Anticancer Cargo by Bladder Tumor Cells

Published date: April 6, 2013

Technology description

Background

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.

Technology Summary

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.

Application area

Medical/Healthcare
Pharmaceuticals
Drug Development
Biotechnology

Advantages

High-affinity targeting of bladder tumor cells

Rapid internalization

Binding is resistant to the acidic environment of the bladder

Institution

Purdue University

Inventors

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