Detection and treatment of bladder cancer using bioconjugates that target tumor cell surface

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Technology description

Summary
Given the prevalence of bladder cancer in the United States, it is surprising that only a limited number of treatments exist for this disease. To address this unmet need, researchers at Oregon Health & Science University have developed a targeted, novel bioconjugate for use in detecting and treating early stage, non-invasive bladder cancer.
Technology Overview
About half of all bladder cancers are identified early, when they are in the non-invasive stage and are limited to the innermost layer of the bladder wall. Despite current treatments, non-invasive bladder cancers are likely to recur. This results in high lifetime healthcare costs for repeated surveillance and treatment of these patients, and makes these cancers the most expensive of all cancers to treat per capita. The difficulty in treating early stage bladder cancer and the high cost associated with it underscore the need to find an effective and easy method of bladder cancer diagnosis and treatment when the cancer is still in the non-invasive stage.
OHSU’s unique detection and treatment method specifically targets early stage tumor cells in the bladder by taking advantage of the altered architecture of the tumor cell, compared to that of the surrounding normal cells. The method depends upon a bioconjugate that includes a targeting molecule that is specific for tumor cells and either i) a detectable marker for visible detection of early stage cancer or ii) an anti-tumor agent for tumor cell killing. This technology can be applied to other disorders where the normal architecture of an epithelial cell is lost.
Publication
Leonoudakis D., Huang G., Akhavan A., Fata J.E., Singh M., Gray J.W., Muschler J.L., Endocytic trafficking of laminin is controlled by dystroglycan and is disrupted in cancers. 2014: J. Cell Sci., 127(22): 4894-4903.

Advantages

OHSU's unique bioconjugate technology is advantageous over existing technologies to detect or treat bladder cancer as it:
• is administered directly into the bladder, avoiding systemic exposure

• specifically targets tumor cells within the bladder
• can incorporate imaging molecules or therapeutics, for either screening or therapeutic applications

Institution

State of Oregon

Inventors

John Muschler
Research Associate Professor
SM.Biomedical Engineering
James (jim) Korkola
Research Assitant Professor
SM.Biomedical Engineering