Engulfment Gene GULP1 as a Functional Tumor Suppressor in Urothelial Carcinoma

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Technology description

Invention Novelty:
The technology identifies a novel biomarker to detect the presence of bladder cancer via a urine test. The technology could be coupled with existing urine-based cancer tests to improve sensitivity as a diagnostic or to test drug efficacy.

Value Proposition:
Bladder cancer (BC) is the 6th most common cancer in the US, with approximately 72,000 new cases reported annually. BC is currently diagnosed using cystoscopy and cytology in patients with symptoms, such as hematuria (blood in the urine). However, due to the high recurrence rate, long-term follow-ups are necessary. The cost and invasive qualities of cystoscopy have pushed many in the field to develop voided urine tests. Urine cytology has high specificity but low sensitivity for low-grade bladder tumors. Although several markers have been approved by the US FDA for BC surveillance, only a few are approved for detection of BC in high-risk patients. The technology, based on detection of DNA in voided urine, has relatively high sensitivity (57%). This could be coupled with existing bladder cancer voided urine tests; biomarker panels tend to be favored over single biomarkers because they synergistically increase sensitivity and better reflect complex pathophysiology.

Technical Overview:
Johns Hopkins researchers have utilized quantitative methylation-specific PCR (QMSP) to identify a gene, GULP1, which is specifically silenced by promoter methylation in urothelial carcinoma (UC, 86% of patients show no GULP1 expression by immunohistochemistry). The researchers utilized QMSP to detect methylation of the promoter for GULP1 in the urine of 100+ patients (58 with UC, 46 without), finding that 33 out of 58 patients (57%) with UC tested positive for the methylation, while only 4 out of 48 tested negative (8.7%). The QMSP test for the GULP1 promoter can therefore be utilized as a novel non-invasive UC detection assay, or coupled with a therapeutic to assess disease progression or relapse.

Publication(s):

Hayashi M, et al. (2015) AACR Annual Meeting Abstracts (#4943

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