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2005 Program
New Investigator (3-year project)

Project Title: Genomic Analysis of Voided Urine to Detect Bladder Cancer

Project Summary: Bladder cancer is one of the most prevalent cancers worldwide. Furthermore, superficial bladder cancer has a high rate of recurrence, making it one of the biggest oncological burdens to the healthcare system. Patients with superficial tumors require repeated routine cystoscopy examinations of the bladder to monitor tumor recurrence. The reason these patients have to undergo these painful procedures is due to the absence of accurate laboratory tests available to detect the presence of bladder cancer non-invasively. Consequently, the development of a urinalysis test to detect bladder cancer would be of tremendous benefit to both patients and healthcare systems.

The aim of this proposal is to create a test for detecting bladder cancer, which will facilitate the accurate detection of bladder cancer in naturally voided urine. We will first identify the molecular profiles of bladder cancer cells from a large patient cohort. Bladder lining cells will be isolated from naturally voided urine samples collected from patients with cancer, or non-cancer conditions. The genetic profile (26,000 genes per sample) of these cells will be compared using microarray technology and the gene sets which best identify the tumor-bearing samples will be identified statistically. The products of these candidate genes will be used as biomarkers for validation assays in independent samples and the best discriminatory markers will be tested for potential in tumor-specific urinary tests. The project seeks insights that would enable improvements in the monitoring of bladder cancer by laboratory testing, and which, over the long-term, could lead to the development of the routine cancer screening of the population.