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Vasoactive Intestinal Peptide and Pituitary Adenylate Cyclase Activating Peptide Receptor 1 (VPAC1) Targeted Detection of Genitourinary Cancer: A Urinary Assay

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Introduction: Prostate cancer (CaP) and bladder urothelial cancer (BUC) are the two most common malignancies in urology, and both overexpress VPAC1. VPAC1 is overexpressed at the onset of the malignancy, prior to elevation of PSA, or alteration of cell morphology. We hypothesize that VPAC1 expressed in high density on PC and BUC can be targeted for detection of shed tumor cells (STC) in voided urine, using TP4303, a VPAC1 specific biomolecule labeled with a near infrared fluorophore.

Materials & Methods: Urine samples (n=115) were collected from normal volunteers (n=52) and from patients with CaP (n=27), BUC (n=11), and other non-oncologic complaints (n=25). Four samples (3%) were acellular and excluded (all normal or non-oncologic pts). Cytospun samples were incubated with TP4303 and DAPI counterstain. These slides were examined with confocal fluorescence microscopy.

Results: All 27 CaP patients (100%) and 10/11 BUC pts (91%) had STC. VPAC positive cells were detected much less commonly in the urine samples of normal volunteers or patients with non-oncologic conditions (Table 1).

Conclusions: The method is simple, noninvasive, rapid and appears to detect STC in patients with known prostate and bladder malignancy with high sensitivity. VPAC1 is a promising and novel approach for accurate and non-invasive detection of CaP and BUC from voided urine.(Supported by NIH R01 CA157372-01 and NuView, Inc. (MLT).

Table 1.

Patient Description	Number	VPAC Positive	VPAC Negative
Prostate cancer	27	27 (100%)	0 (100%)
Bladder cancer	11	10 (91%)	1 (9%)
Non-oncology conditions	24	10 (42%)	14 (59%)
Normal volunteer	49	18 (37%)	31 (63%)

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