Claims

1. A method for detecting shed or circulating tumor cells comprising:

(a) contacting an isolated biological fluid from a subject with a labeled pituitary adenylate cyclase activating peptide (PACAP) having a label or labeled vasoactive intestinal peptide (VIP) having a label, and

(b) determining binding of the labeled PACAP or labeled VIP to shed or circulating tumor cells in the biological fluid thereby detecting shed or circulating tumor cells.

2. The method of claim 1, wherein the biological fluid is blood, urine, cerebrospinal fluid, mucus, sputum stool, a gastrointestinal secretion or a mammary gland secretion.

3. The method of claim 1, wherein shed or circulating tumor cells are detected with labeled PACAP and said method further comprises

(c) comparing binding of the labeled PACAP to shed or circulating tumor cells in the biological fluid to binding or lack of binding of labeled PACAP in a control sample; and

(d) diagnosing cancer in the subject, wherein the presence of binding of the labeled PACAP to shed or circulating tumor cells in the biological fluid is indicative of the subject either having, or being at risk for developing, cancer.

4. The method of claim 3, wherein the biological fluid is urine.

5. The method of claim 4, wherein the labeled PACAP includes the sequence of SEQ ID NO: 7.

6. The method of claim 1, wherein the labeled PACAP includes the sequence of one of the following: SEQ ID NO: 1; SEQ ID NO: 2; or SEQ ID NO: 7.

7. The method of claim 6, wherein the label includes a chromophore, fluorophore or protein.

8. The method of claim 6, wherein the label is luminescent or fluorescent.

9. The method of claim 1, wherein the labeled VIP includes the sequence of one of the following: SEQ ID NO: 3; SEQ ID NO: 4; SEQ ID NO: 5; or SEQ ID NO: 6.

10. The method of claim 1, further comprising visualizing the label of the labeled PACAP or labeled VIP to determine the binding.

11. The method of claim 1, comprising detecting the labeled PACAP or labeled VIP bound to a receptor that is overexpressed on cancerous cells.

12. The method of claim 11, comprising distinguishing cancerous cells bound with the labeled PACAP or labeled VIP from cells not bound with the labeled PACAP or labeled VIP.

13. The method of claim 11, comprising distinguishing cancerous cells bound with the labeled PACAP or labeled VIP from epithelial cells or white blood cells that are not

bound with the labeled PACAP or labeled VIP.

14. The method of claim 1, comprising diagnosing the subject as having or being susceptible to prostate cancer, bladder cancer, or renal cancer when the biological sample is a urine sample.

15. The method of claim 1, comprising diagnosing the subject as having or being susceptible to breast cancer, lung cancer, or ovarian cancer when the biological sample is a blood sample.