Method for Detection of Prostate Specific Membrane Antigen in Serum
Ref# 809028-01

Keywords: Prostate-specific membrane antigen (PSMA), glycoprotein, diagnostic, prostate, foreign issued.

Collaboration Research Opportunity: Roswell Park Cancer Institute is seeking partners to help co-develop a method for detecting prostate specific membrane antigen as a method for detection in prostate disease.

Summary: Prostate cancer is the most common cancer in males in the United States. The efficiency of early detection of prostate cancer has increased with a serum test for the prostate-specific antigen (PSA). However, PSA is neither tissue-specific nor disease-specific. Many other conditions of the prostate gland, some of them being benign, can also result in abnormal elevation of PSA level in the serum.

Prostate-specific membrane antigen (PSMA) is a transmembrane glycoprotein with both intra and extracellular domains, and is highly specific for the prostate tissue. PSMA is expressed in benign and malignant prostatic epithelium and can be detected immunohistochemically. It has been found that expression of prostate-specific membrane antigen is greatest in prostate adenocarcinoma and lymph node metastasis. PSMA serum levels have therefore been proposed to be of prognostic significance in prostate cancer patients with advanced disease. Attempts to reliably detect PSMA in serum have not been successful and currently, there is no routine methodology available to monitor PSMA levels in the sera of prostate cancer patients.

Technology: Researchers at Roswell Park Cancer Institute have discovered and patented a method for detecting prostate specific membrane antigen (PSMA) in a body fluid sample containing PSMA by immunoassay. The steps include capturing PSMA from the sample using a PSMA antibody and detecting the captured PSMA with an anti-α1-antichymotrypsin antibody. PSMA is captured using an appropriate dilution of anti-PSMA antibody, coating a surface such as the surface of wells in a microtiter plate, with the resulting solution, blocking non-specific sites on the surface with blocking solution such as albumin, diluting the sample with a blocking buffer such as buffered albumin and applying a diluted sample to the surface to capture PSMA. The body fluid is preferably serum but may also include urine.

Potential Commercial Applications:
- Ability to be used as a prognostic, as level of PSMA detected correlates well with the stage of disease.
- PSMA can be potentially monitored using different body fluids.
- Level of PSMA in cancer patients is significantly higher as compared to BPH or Prostatis.

Competitive Advantages:
- Prior to this invention, attempts to use simpler ELISA to detect prostate cancer have not been successful.
- In “competitive inhibition” ELISA, PSMA was previously detected in 46% of sera from prostate cancer patients and none in BPH or normal individuals, clearly insufficient reliability for a determinative test.
- PSMA also has a strong affinity for Thiophilic gels (1S, 2S, and 3S).

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