



# DIAGNOSTIC AUTOMATION, INC.

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2°C-8°C



Σ=96 tests



Cat # 4222Z

## MICROWELL ELISA PROSTATE SPECIFIC ANTIGEN (PSA) ENZYME IMMUNOASSAY TEST KIT

# PSA ELISA

**Cat # 4222Z**

**Enzyme Immunoassay for the Quantitative Determination of Prostate Specific Antigen (PSA) in Human Serum**

<b>Test</b>	<b>Prostate Specific Antigen ELISA</b>
<b>Method</b>	<b>Enzyme Linked Immunosorbent ELISA</b>
<b>Principle</b>	<b>Peroxidase – Conjugated ELISA</b>
<b>Detection Range</b>	<b>0-100 ng/mL</b>
<b>Sample</b>	<b>50µl serum</b>
<b>Specificity</b>	<b>98.7%</b>
<b>Sensitivity</b>	<b>0.5ng/ml</b>
<b>Total Time</b>	<b>~ 140 min</b>
<b>Shelf Life</b>	<b>12 -14 months</b>

*\* Laboratory results can never be the only base of a medical report. The patient history and further tests have to be taken into account*

## INTENDED USE

The Diagnostic Automation PSA Enzyme Immunoassay test kit is intended for the quantitative determination of PSA in human serum.

## INTRODUCTION

Human prostate-specific antigen (PSA) is a serine protease, a single chain glycoprotein with a molecular weight of approximately 34,000 daltons containing 7% carbohydrate by weight. PSA is immunologically specific for prostatic tissue, it is present in normal, benign hyperplastic, and malignant prostatic tissue, in metastatic prostatic carcinoma, and also in prostatic fluid and seminal plasma. PSA is not present in any other normal tissue obtained from men, nor is it produced by cancers of the breast, lung, colon, rectum, stomach, pancreas or thyroid. Besides, it is functionally and immunologically different from prostatic acid phosphatase (PAP).

Elevated serum PSA concentrations have been reported in patients with prostate cancer, benign prostatic hypertrophy, or inflammatory conditions of other adjacent genitourinary tissues, but not in apparently healthy men, men with non-prostatic carcinoma, apparently healthy women, or women with cancer. Reports have suggested that serum PSA is one of the most useful tumor markers in oncology. It may serve as an accurate marker for assessing response to treatment in patients with prostatic cancer. Therefore, measurement of serum PSA concentrations can be an important tool in monitoring patients with prostatic cancer and in determining the potential and actual effectiveness of surgery or other therapies.

Recent studies also indicate that PSA measurements can enhance early prostate cancer detection when combined with digital rectal examination (DRE).

## PRINCIPLE OF THE TEST

The PSA EIA test is a solid phase two-site immunoassay. Rabbit anti-PSA is coated on the surface of the microtiter wells and another anti-PSA monoclonal antibody labeled with horseradish peroxidase is used as the tracer. The PSA molecules present in the standard solution or serum are "sandwiched" between the two antibodies. Following the formation of the coated antibody-antigen-antibody-enzyme complex, the unbound antibody-enzyme tracers are removed by washing. The horseradish peroxidase activity bound in the wells is then assayed by a colorimetric reaction. The intensity of the color formed is proportional to the concentration of PSA present in the sample.

## MATERIALS AND COMPONENTS

### **Materials provided with the test kits:**

- Antibody-coated microtiter plate with 96 wells.
- Zero buffer, 12 ml.
- Reference standard containing 0, 2, 4, 15, 50, and 100 ng/ml PSA, Liquid standards, ready for use. 1 set.
- Enzyme Conjugate Reagent, 12 ml.
- TMB Substrate, 12 ml.
- Stop Solution, 12 ml.
- Wash Buffer Concentrate (50X), 15 ml

### **Materials required but not provided:**

- Precision pipettes: 0.040~0.2 ml
- Disposable pipette tips.

- Distilled water.
- Vortex mixer or equivalent.
- Absorbent paper or paper towel.
- Graph paper.
- A microtiter plate reader with a bandwidth of 10nm or less and an optical density range of 0-2 OD or greater at 450nm

## SPECIMEN COLLECTION AND PREPARATION

1. Blood should be drawn using standard venipuncture techniques and the serum should be separated from the red blood cells as soon as practical. Avoid grossly hemolytic, lipemic or turbid samples.
2. Plasma samples collected in tubes containing EDTA, heparin, or oxalate may interfere with the test procedures and should be avoided.
3. Specimens should be capped and may be stored up to 48 hours at 2-8°C, prior to assaying. Specimens held for a longer time can be frozen at -20°C. thawed samples must be mixed prior to testing.

## STORAGE OF TEST KITS

Unopened test kits should be stored at 2-8°C upon receipt. The microtiter plate should be kept in a sealed bag with desiccants, to minimize exposure to damp air. Opened test kits will remain stable until the expiration date, provided it is stored as described above.

## REAGENT PREPARATION

1. All reagent should be brought to room temperature (18-22°C ) before use.
2. Dilute 1 volume of Wash Buffer Concentrate (50x) with 49 volumes of distilled water. For example, Dilute 15 ml of Wash Buffer (50x) into distilled water to prepare 750 ml of washing buffer (1x). Mix well before use.

## ASSAY PROCEDURE

1. Secure the desired number of coated wells in the holder.
2. Dispense **50**µl of standards, specimens, and controls into appropriate wells.
3. Dispense **100**µl of zero buffer into each well.
4. Thoroughly mix for 10 seconds. It is very important to have a complete mixing in this setup.
5. Incubate at room temperature (18-22°C) for 60 minutes.
6. Remove the incubation mixture by emptying plate contents into a waste container.
7. Rinse and empty the microtiter wells 5 times with washing buffer (1X).
8. Strike the wells sharply onto absorbent paper or paper towels to remove all residual water droplets.
9. Dispense **100**µl of Enzyme Conjugate Reagent into each well. Gently mix for 5 seconds.
10. Incubate at room temperature for 60 minutes.
11. Remove the incubation mixture by emptying plate contents into a waste container.
12. Rinse and empty the microtiter wells 5 times with washing buffer (1X).
13. Strike the wells sharply onto absorbent paper to remove residual water droplets.
14. Dispense **100**µl TMB solution into each well. Gently mix for 5 seconds.
15. Incubate at room temperature for 20 minutes.
16. Stop the reaction by adding **100**µl of Stop Solution to each well.
17. Gently mix for 30 seconds to make sure that the blue color completely changes to yellow.
18. Using a microtiter plate reader, read the optical density at 450nm within 20 minutes.

**Important Note:**

1. The wash procedure is critical. Insufficient washing will result in a poor precision and falsely elevated absorbance readings.
2. It is recommended that no more than 32 wells be used for each assay run, if manual pipetting is used, since pipetting of all standards, specimens and controls should be completed within 3 minutes. A full plate of 96 wells may be used if automated pipetting is available.
3. Duplication of all standards and specimens, although not required, is recommended.

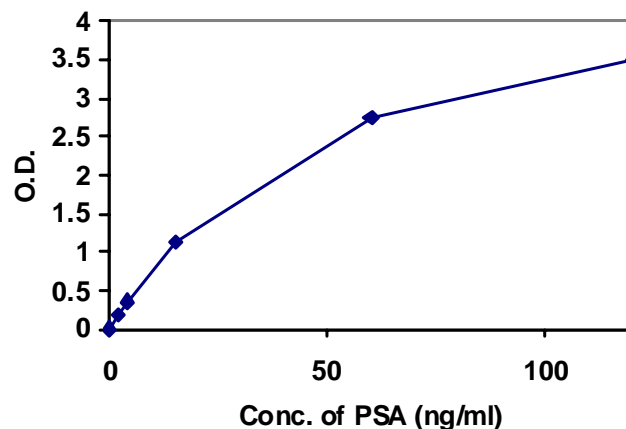
**CALCULATION OF RESULTS**

Calculate the mean absorbance value ( $A_{450}$ ) for each set of reference standards, controls, and patient samples. Construct a standard curve by plotting the mean absorbance obtained from each reference standard against its concentration in ng/ml on graph paper. The absorbance values are placed on the vertical or Y-axis and concentrations on the horizontal or X-axis. Use the mean absorbance values for each specimen to determine the corresponding concentration of PSA in ng/ml from the standard curve.

**EXAMPLE OF STANDARD CURVE**

Results of typical standard run with optical density reading at 450nm shown in the Y-axis against PSA concentrations shown in the X-axis.

PSA (ng/ml)	Absorbance (450nm)
0	0.008
2	0.231
4	0.447
15	1.254
50	2.659
100	3.593



This standard curve is for the purpose of illustration only, and should not be used to calculate unknowns. Each user should obtain his or her own standard curve and data.

## EXPECTED VALUES AND SENSITIVITY

Healthy males, who are under 50, are expected to have **PSA values below 4 ng/ml**. However, PSA is also age dependent. Therefore the normal range of PSA varies with age. The following is a guideline adjusted for age:

Age 40-49 0.0-2.5 ng/ml

Age 50-59 0.0-3.5 ng/ml

Age 60-69 0.0-4.5 ng/ml

Age 70-79 0.0-6.5 ng/ml

The minimum detectable concentration of PSA in this assay is estimated to be 0.5 ng/ml.

## LIMITATIONS OF THE PROCEDURE

1. Reliable and reproducible results will be obtained when the assay procedure is carried out with a complete understanding of the package insert instructions and with adherence to good laboratory practice.
2. The wash procedure is critical. Insufficient washing will result in poor precision and falsely elevated absorbance readings.
3. Heterophilic antibodies such as human anti-mouse antibodies (HAMA) are frequently found in the serum of human subjects. Those antibodies can cause severe interference in many immunodiagnostic procedures. This assay has been designed to minimize that kinds of interference. Nevertheless, complete elimination of this interference from all patient specimens cannot be guaranteed. A test result that is inconsistent with the clinical picture and patient history should be interpreted with caution.

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