

Product Information

Prostate Specific Antigen (PSA) ELISA

Catalog Number **SE120106**
Storage Temperature 2–8 °C

TECHNICAL BULLETIN

Product Description

Prostate Specific Antigen (PSA) is a single chain glycoprotein produced by epithelial cells of the prostate gland. PSA is useful in the management of patients with prostate cancer. The measurement of serum PSA has become the most accepted test to indicate men who are at risk of having prostate cancer and who should be examined by other tests. Using a cut-off of 4 ng/mL, 92% of men over 50 years of age with malignant prostatic tissues, 8% of healthy men, and 28% of men with benign prostate hyperplasia (BPH) test positive for PSA. Three major forms of PSA exist in the serum: free PSA, bound PSA, and complex PSA. Bound PSA is found in higher concentrations in patients with prostate cancer; whereas, free PSA is detected in higher concentrations in patients with BPH. If the free PSA to total PSA ratio is >25%, it is unlikely that the patient has prostate cancer; whereas, if free PSA is <16% then prostate cancer is likely to be the cause. Serial measurement of PSA concentration in the serum is an important tool in monitoring patients with prostatic cancer, and determining the potential and actual effectiveness of surgery or other therapies, or may allow for earlier discovery of residual or recurrent carcinoma after radical prostatectomy or radiotherapy. Current indications suggest men over 50 years should be screened with digital rectal examination and PSA. Men with a high risk of prostate cancer, such as a family history or of African heritage, should begin annual testing at age 40 years. If both are normal, the patient can be followed with annual evaluations and monitoring to determine the rate of change. Slight elevations in PSA (4.1–10.0 ng/mL) warrant a transrectal ultrasound (TRUS) to evaluate prostate volume and echogenicity of the gland. Hypo-echogenic lesions should be biopsied. Elevated PSA density (>0.15 ng/mL/cc), very high PSA (>10 ng/mL) or a free-to-total PSA ratio of <16% warrants systemic biopsy.

The Prostate Specific Antigen (PSA) ELISA kit is intended for the quantitative measurement of PSA in human serum. The PSA ELISA is a solid phase assay based on a streptavidin-biotin principle. The standards, samples, and a reagent mixture of Anti-PSA Enzyme and biotin conjugates (Conjugate reagent) are added into the wells, coated with streptavidin. PSA in the serum forms a sandwich between two highly specific Anti-PSA antibodies, labeled with Biotin and HRP. Simultaneously, the biotinylated antibody is immobilized onto the well through a high affinity Streptavidin-Biotin interaction. Unbound protein and excess Biotin/Enzyme conjugated reagent are washed off. Upon the addition of the substrate, the intensity of color developed is directly proportional to the concentration of PSA in the samples. A standard curve is prepared relating color intensity to the concentration of the PSA.

Components

Materials Provided	96 Tests
Microwells coated with Streptavidin	12 x 8 x 1
PSA Standard: 6 vials (ready to use)	0.5 mL
Anti-PSA Conjugate Reagent: 1 bottle (ready to use)	12 mL
TMB Substrate: 1 bottle (ready to use)	12 mL
Stop Solution: 1 bottle (ready to use)	12 mL
20x Wash concentrate: 1 bottle	25 mL

Reagents and Equipment Required but Not Provided.

1. Distilled or deionized water
2. Precision pipettes. Disposable pipette tips
3. ELISA reader capable of reading absorbance at 450 nm
4. Absorbent paper or paper towel
5. Graph paper

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions**Sample Preparation**

1. Collect blood specimens and separate the serum immediately.
2. Specimens may be stored refrigerated at (2–8 °C) for 5 days. If storage time exceeds 5 days, store frozen at (–20 °C) for up to one month.
3. Avoid multiple freeze-thaw cycles.
4. Prior to assay, frozen sera should be completely thawed and mixed well.
5. Do not use grossly lipemic specimens.

20x Wash Buffer Concentrate

Prepare 1x Wash buffer by adding the contents of the bottle (25 mL, 20x) to 475 mL of distilled or deionized water. Store at room temperature (18–26 °C).

Storage/Stability

Store the kit at 2–8 °C.

Procedure

Notes: The components in this kit are intended for use as an integral unit. The components of different lots should not be mixed.

It is recommended that serum samples be run in duplicate.

Do not use sodium azide as preservative. Sodium azide inhibits HRP enzyme activities.

Optimal results will be obtained by strict adherence to this protocol. Accurate and precise pipetting, as well as following the exact time and temperature requirements prescribed are essential. Any deviation from this may yield invalid data.

Prior to assay, allow reagents to stand at room temperature. Gently mix all reagents before use.

1. Place the desired number of coated strips into the holder.
2. Pipette 25 µL of PSA standards, control, and patient's sera.
3. Add 100 µL of the Anti-PSA conjugate reagent into all wells. Shake the plate for 10–30 seconds.
4. Cover the plate and incubate for 60 minutes at room temperature (18–26 °C).
5. Remove liquid from all wells. Wash wells three times with 300 µL of 1x Wash Buffer. Blot on absorbent paper or paper towel.
6. Add 100 µL of TMB substrate into all wells.
7. Incubate for 15 minutes at room temperature.
8. Add 50 µL of Stop Solution into all wells. Shake the plate gently to mix the solution.
9. Read absorbance on ELISA Reader at 450 nm within 15 minutes after adding the Stop Solution

Results

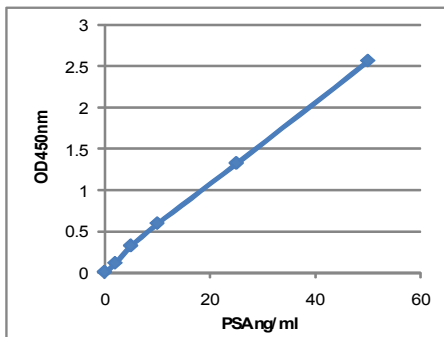
Calculations

The standard curve is constructed as follows:

1. Check PSA standard value on each standard vial.
This value might vary from lot to lot. Make sure the value is checked on every kit.
2. To construct the standard curve, plot the absorbance for the PSA standards (vertical axis) against its concentration in ng/mL (horizontal axis) on a linear graph paper. Draw the best curve through the points.
3. Use the absorbance for controls and each unknown sample to determine the corresponding concentration of PSA from the standard curve.

Example of a Standard Curve

	OD 450 nm	Concentration ng/mL
Std 1	0.01	0
Std 2	0.12	2
Std 3	0.33	5
Std 4	0.60	10
Std 5	1.33	25
Std 6	2.57	50



Expected values

It is recommended that each laboratory establish its own normal ranges based on a representative sampling of the local population. The following values for PSA may be used as initial guideline ranges only:

PSA Normal Range = <4 ng/mL

Product Profile

Sensitivity

The minimum detectable concentration for the PSA ELISA as measured by 2 x SD from the mean of 20 zero standards is estimated to be 0.0144 ng/mL.

References

1. Espana, F. et al., Quantitative immunoassay for complexes of prostate-specific antigen with alpha2-macroglobulin. *Clin. Chem.*, 1996; 42(4):545-50.
2. Corey, E. et al., Characterization of 10 new monoclonal antibodies against prostate-specific antigen by analysis of affinity, specificity and function in sandwich assays. *Int. J. Cancer*, 1997; 71(6):1019-28.
3. Barak, M. et al., The additional value of free prostate specific antigen to the battery of age-dependent prostate-specific antigen, prostate-specific antigen density and velocity. *Eur. J. Clin. Chem. Clin. Biochem.*, 1997; 35(6): 475-81.
4. Vogl, M. et al., Clinical usefulness of percentage of free serum prostate specific antigen. *Clin. Chim. Acta*, 1997; 258(1):79-90.
5. Stenman, U.H. et al., Problems in the determination of prostate specific antigen. *Eur. J. Clin. Chem. Clin. Biochem.*, 1996; 34(9):735-40.

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