SERATEC® PSA Semiquant

**Application**

SERATEC® PSA Semiquant is a chromatographic immunoassay for rapid semiquantitative detection of prostate-specific antigen (PSA) to identify seminal fluid in forensic samples. The product contains two monoclonal anti-human PSA antibodies as active components.

**Materials**

- 8 or 40 (PSM400F/8, PSM400F/40) individually packaged PSA Semiquant in cassette format with one plastic pipette each
- 15 or 50 ml (PSM400F/8, PSM400F/40) extraction buffer
- Instructions for use
- Additional required: stopwatch or timer

**Test performance**

1. Bring all test components to room temperature before performing the test. Low temperatures can lead to a decrease in sensitivity.
2. Remove the test cassette from the pouch and label it for identification.
3. Add 3 drops of the sample (approx. 120 µl) to the sample well with the enclosed plastic pipette and start the time measurement.
4. Read the test result after 10 minutes at room temperature. The liquid in the sample well should have been completely absorbed.
5. Keep the remaining sample material to perform further testing if necessary.

**Interpretation of results**

After 10 minutes, up to three lines may be visible in the result window:

- **Negative result** (PSA is not detectable; no PSA in the sample or concentration below the limit of detection): Two lines visible in the result window. The test result line (T) is not visible. The appearing internal standard line and control line (C) confirm that the test has been performed correctly.
- **Positive result** (PSA detectable): Three lines visible in the result window: the test result line (T), the internal standard line and the control line (C). Any visible T-line (with strong or weak intensity) is to be considered a positive result.

**Sample preparation**

In order to obtain optimal test results, follow these instructions:

- It is not recommended to use unknown samples undiluted. Liquid samples should be diluted at least 1:500 prior to testing. [1]
- Viscous samples should be diluted until the sample flows smoothly on the test membrane.
- Use the buffer solution included in the scope of supply, as it has been developed specifically for the PSA Semiquant. Other buffer solutions or the use of water may result in reduced sensitivity or fluctuating line intensities.
- Do not use liquids with a pH below 3 or above 12, as this may cause incorrect or invalid results.
- Tissue particles do not affect the test result.
- Cotton swabs, cloth or condom pieces should be extracted in a sufficient amount of buffer. The cut piece should be between 0.25 and 1 cm² in size and should be extracted in approx. 0.5 – 1 ml buffer.
- An extraction time of approx. 10 minutes is recommended. You should however follow the rule that the older or smaller the stain, the longer the recommended extraction time.[2]
- Extracted samples are stable at room temperature for about 2 days. Samples kept for longer periods should be stored dry and cold (2 – 8 °C). Liquid samples may be frozen.

**Extraction buffer**

The supplied extraction buffer contains the following constituents (in 1 l distilled H₂O):
- 8,0 g NaCl; 0,2 g KCl; 1,44 g Na₂HPO₄·2H₂O; 0,24 g KH₂PO₄; 0,1 ml 10 wt% NaN₃; pH 7,4.

**DNA profiling**

The extracted samples can be stored for further analyses (e.g. DNA profiling; see Sample preparation). The extracted sample is compatible with DNA analyses. It is also possible to extract DNA from the sample pad for further analysis.[3,4]

**Safety information**

Forensic samples are potentially infectious material which should be examined with the appropriate care and only when suitable protective measures (e.g. gloves, laboratory clothing) are applied. Materials used to perform the test should be autoclaved before disposal, as they contain potentially infectious material. Observe the following instructions:

- Do not use the product if damaged.
- Only remove the test cassette from the pouch immediately before use.
- Do not use the product after the expiration date.
• The materials used in the test (e.g. antibodies) are potentially infectious materials. When used and disposed of properly, however, there is no danger to the user or others.
• Do not freeze the test cassette.

Background
Prostate-specific antigen (PSA) is a glycoprotein produced in the prostate. It is secreted into the seminal fluid for liquefaction and reaches concentrations of 0.2 to 3.0 mg/ml. These high levels as well as the fact that PSA only occurs in very low concentrations (0.0 – 1.25 ng/ml) in female vaginal secretions make PSA a suitable marker for the detection of small quantities of seminal fluid. The benefits in forensic application compared to other detection methods are:
• Easy handling without additional equipment – directly at the crime scene or in the laboratory.
• A quick and reliable result after 10 minutes.
• Detection of PSA is also possible in cases where no sperm cells can be found (e.g. after a vasectomy).[7]
• High stability of PSA – positive detection could be obtained with 30-year-old samples.[7]
• Detection of PSA in vaginal swabs up to 27 hours after sexual intercourse.[5,7]
• Higher specificity of PSA for the detection of seminal fluid compared to "acid phosphatase tests".[6,7]
• In simulated samples of vomit, PSA was detectable for up to 4 hours.[8]
• Greater reliability in the detection of PSA in vaginal swabs compared to semenogelin.[9]

Note: Besides seminal fluid, PSA occurs in other body fluids and secretions/excretions, e.g. blood, urine, stool.[10,11] The recommended sample dilution (see sample preparation) reduces the probability that samples not containing any seminal fluid show a positive test result. More information on PSA in body fluids as well as recommendations on the use of SERATEC® PSA Semiquant in forensic biology have been gathered by the manufacturer in a freely available document and can be found in the references. [1,2,12]

Sensitivity
SERATEC® PSA Semiquant can be used to detect quantities of 1 ng/ml human PSA. The high dose hook effect will not impact a positive test result. Seminal fluid diluted in the range between 1:1 and 1:10⁴ is successfully detected in the recommended extraction buffer.

Specificity
SERATEC® PSA Semiquant does not show any cross-reactivity with other proteins in seminal fluid. No cross-reactivity was observed with seminal fluid from other mammals (dog, cat, horse, bull, pig, ram and others).[7,13] A possible exception is seminal fluid from higher primates, but no data on cross-reactivity are available.

Storage and shelf life
• Store test cassettes and buffer solution at +2 to +30 °C (38 to 86 °F).
• Keep test cassettes in the pouch until use.
• Do not use after the specified expiration date.

Quality features
Our products are manufactured according to the quality standards of European standard ISO 9001. The performance characteristics are confirmed during final quality control in application of the following WHO-standard: PSA NIBSC Code 96/668 and 17/102.

Please contact us if you have any questions or require more information.

Literature

Symbols

- Expiry date
- Storage temperature
- Lot number

As of June 2019