Evaluation of prostate-specific antigen (PSA) membrane test assays for the forensic identification of seminal fluid

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Abstract

Prostate specific antigen (PSA, also known as p30), a glycoprotein produced by the prostatic gland and secreted into seminal plasma, is a marker used for demonstrating the presence of seminal fluid. Methods for the detection of PSA include Ouchterlony double diffusion, crossover electrophoresis, rocket immuno-electrophoresis, radial immunodiffusion, and ELISA. The extremely sensitive ELISA technique can detect PSA in concentrations as low as approximately 4 ng/mL. However, all these techniques are cumbersome and time consuming to perform in forensic laboratories, especially when only a few samples per week are processed. Various membrane tests are currently used in clinical settings to screen a patient's serum for the presence of PSA at levels greater than 4 ng/mL. In this study we evaluated three immunochromatographic PSA membrane tests by analyzing semen stains stored at room temperature for up to 30 years, post-coital vaginal swabs taken at different time after intercourse, semen-free vaginal swabs, and various female and male body fluids, including urine. The data demonstrate that PSA membrane test assays offer the same sensitivity as ELISA-based tests and provide a rapid approach for the forensic identification of seminal fluid. Furthermore, when the supernatant from a DNA extraction is used for the assay, there is essentially no DNA consumption for determining the presence of PSA in a forensic sample.

Source

Journal of Forensic Sciences,1999 Sep; 44(5): 1057-60.

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