

USE OF SPERM TRACKER IN CASES AFTER VALIDATION

VANESSA VANVOOREN

ENFSI DNA WG, LUXEMBURG MAY 2025

INTRODUCTION



AXO Science

- Sensitive
- Specific
- Non toxic
- Easy and ready to use
- ISO18385

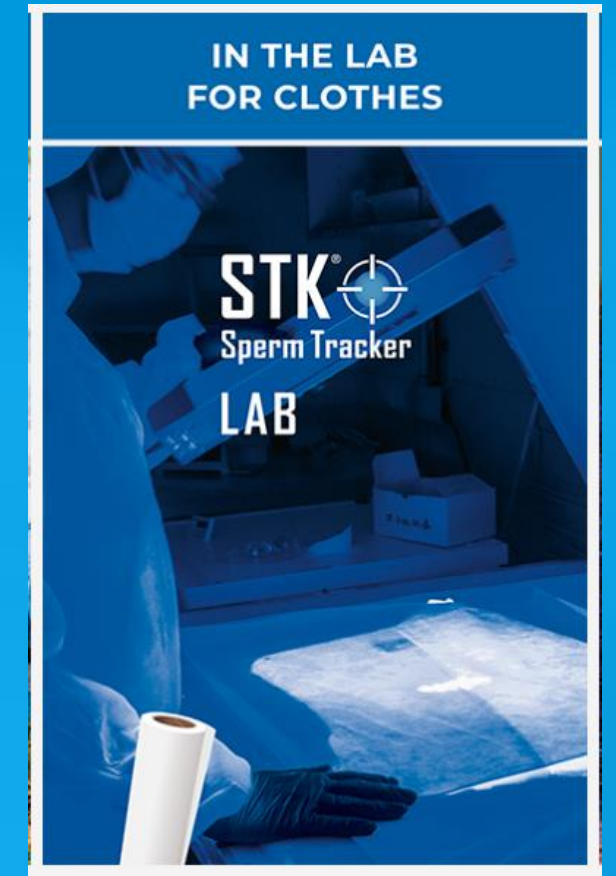


INTRODUCTION



Sperm Tracker= STK

- Detection tool for seminal fluid
- Acid Phosphatases: Enzymes in seminal fluid
- Hydrolysis: Chemical reaction process
- α -Naphthyl Phosphate: Substrate on Sperm Tracker paper
- Fluorogen Release: Fluorescent signal generation
- Detection at 365 nm: Measurement wavelength



INTRODUCTION



1

Using a sprayer, wet absorbing side of a piece of STK with demineralized water



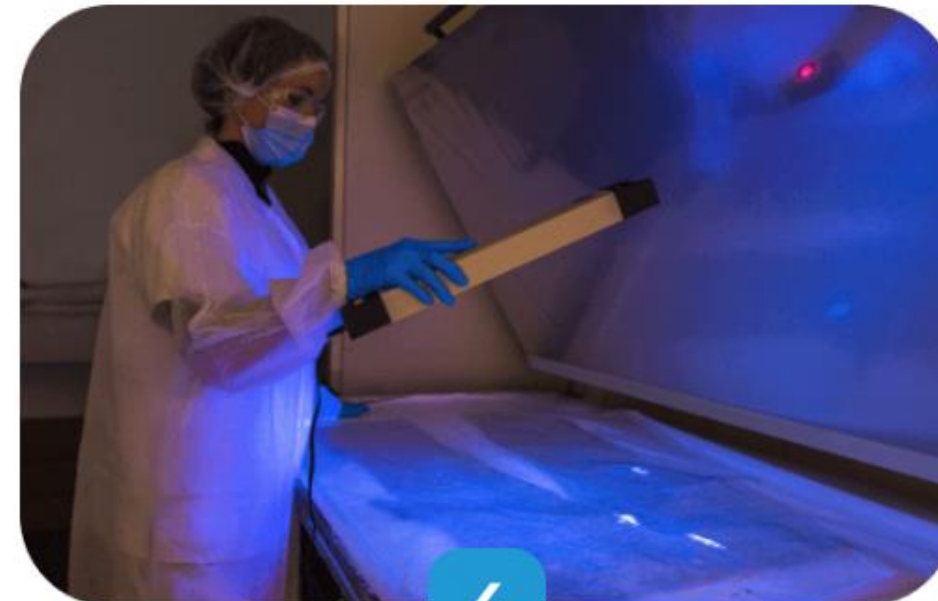
2

Cover area to be tested with wet absorbing side against item. It is possible to analyse both sides at the same time by sandwiching the item



3

Press for 3 minutes



4

Read results with a 365 nm UV light. Only semen stains with glow

INTRODUCTION

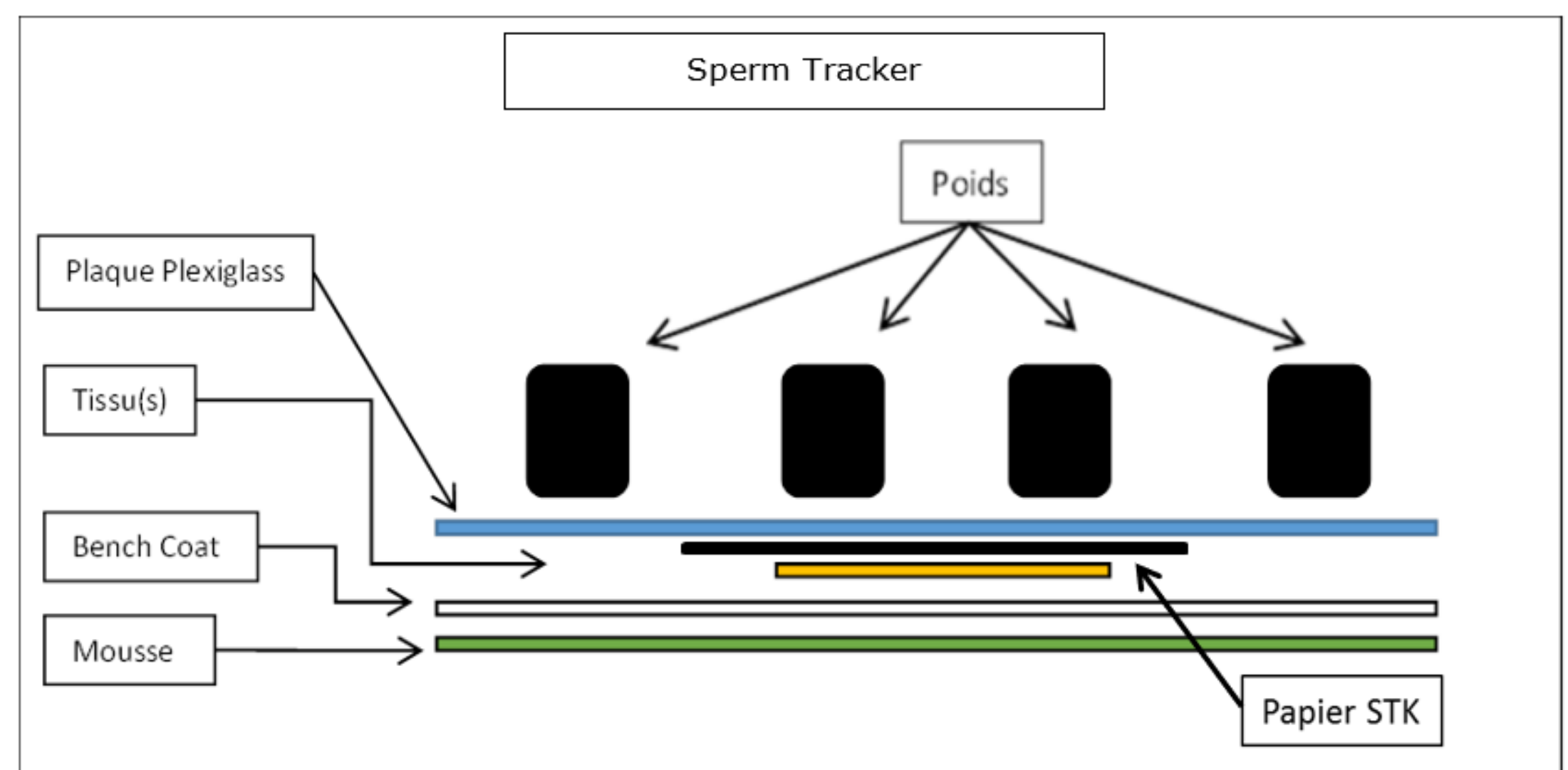
Plexiglass plate

8kg weights

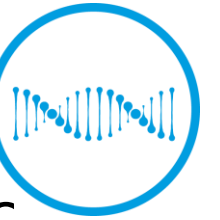


Press device

Pneumatic Press Device 150 cm x 92 cm working space



VALIDATION



Detection Limit: Test pure semen and dilutions (2x, 10x, 20x, 50x, 100x) under conditions (fabric types, biological fluids, trace age).

Specificity: Test pure biological fluids and mixtures with semen (2x, 10x, 20x).
Fluids: female blood, male urine, female urine, vaginal fluid, female saliva.

Robustness: Test pure semen and dilutions on various fabrics: jeans, white cotton, black cotton, polyester, bath towel, wool.

Comparison with Crime-Lite and Vilber Lamp:

- ✂ Observe samples with Crime-Lite and Vilber lamp before STK test.
- ✂ Compare detection methods based on fabric type and trace age.

DNA quantity and genetic analysis:

- ✂ Test pure semen and dilutions on white cotton.
- ✂ Perform STK test before DNA quantification.
- ✂ Compare trace transfer to STK paper.

Trace Age: Test pure semen, physiological serum, and dilutions after 24h, 1 week, 1 month, 6 months on white cotton. Evaluate influence of trace age on detection.

Repeatability: Perform each test three times by the same group to assess variability.

Reproducibility: Test pure semen and dilutions with STK method by different personnel to verify reproducibility.

VALIDATION



Detection Limit: Sperm Tracker detects seminal fluid up to at least 2x dilution under all tested conditions (fabric types, biological fluids, trace age).

Specificity: No false positives or negatives among tested biological fluids. Detects seminal fluid mixed with other biological fluids up to 2x dilution.

Robustness: Detects pure and 2x diluted semen on all fabric types tested.

Comparison with Crime-Lite and Vilber Lamp:

Vilber lamp alone shows only negative results. Crime-Lite shows variable results with false positives and negatives. Combination Sperm Tracker + Vilber lamp for semen trace detection is the most suitable.

DNA quantity and genetic analysis:

Trace transfer to Sperm Tracker paper is negligible (<1%).

Trace Age: Detects pure and 2x diluted semen for traces aged 24h, 1 week, 1 month, and 6 months.

Repeatability: Consistent results up to 2x dilution across repetitions.

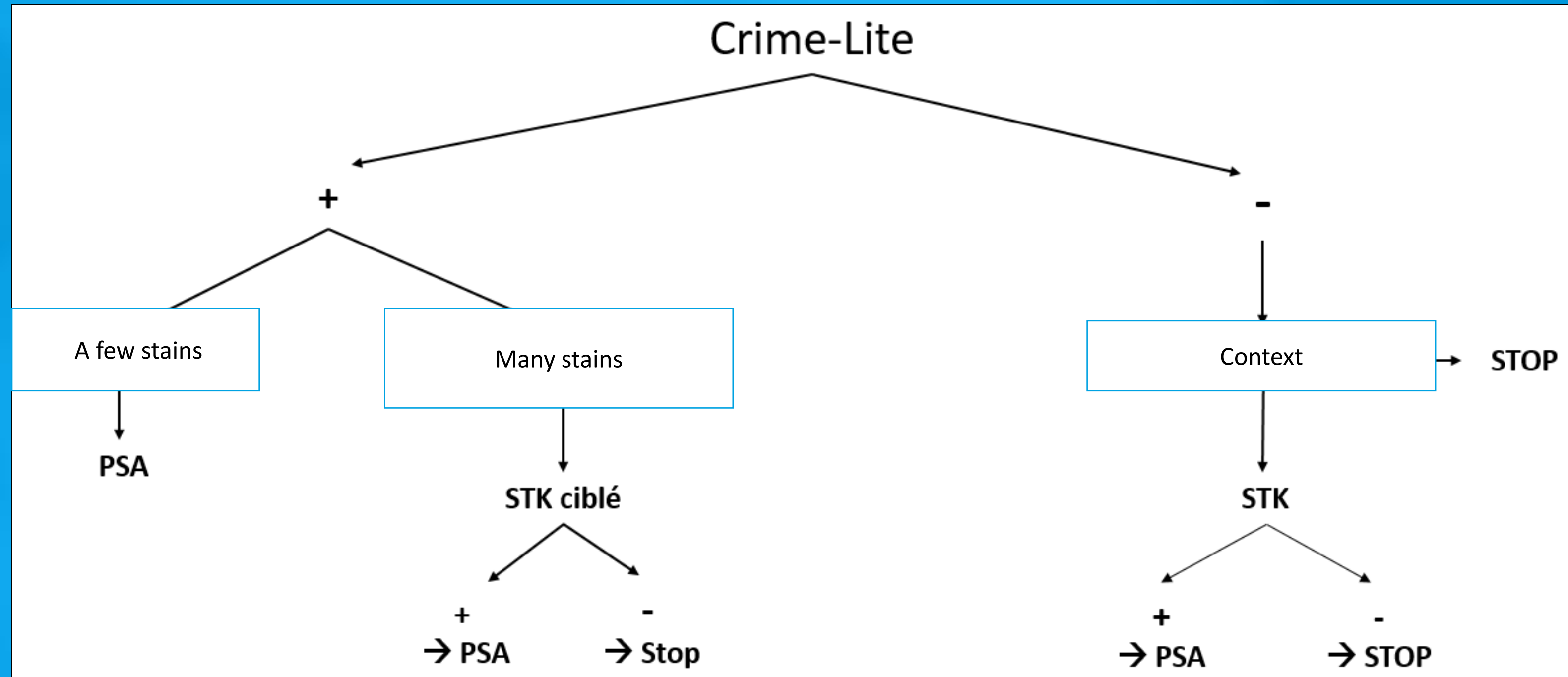
Reproducibility: Consistent results up to 2x dilution across different experimenters.

TIPS



- Vilber lamp/~~crime lite~~ + paper STK
- STK paper :
 - Store away from light and heat.
 - Temperature: 14°C to 30°C.
 - Humidity: Below 60%.
 - Usage: Recommended within 3 months of opening; effective up to 6 months based on tests.
- Non human specific

PROCESS: "HOW DO WE USE STK?"



USE OF STK - SPERM TRACKER LAB- IN CASES AFTER VALIDATION



- Detection of acid phosphatase activity present in semen
- Detection Limit: Sperm Tracker detects seminal fluid up to 2x dilution under all tested conditions (fabric types, biological fluids, trace age).
- Specificity: No false positives or negatives among tested biological fluids (female blood, male urine, female urine, vaginal fluid, female saliva..)
- Robustness: Detects pure and 2x diluted semen on all fabric types (jeans, white cotton, black cotton, polyester, bath towel, wool)
- Comparison: Vilber lamp alone shows only negative results. Crime-Lite shows variable results with false positives and negatives. Combination Sperm Tracker + Vilber lamp for semen trace detection is the most suitable.
- DNA quantity and analysis: Trace transfer to Sperm Tracker paper is negligible (<1%).
- Trace age: Detects pure and 2x diluted semen for traces aged 24h, 1 week, 1 month, and 6 months.
- Repeatability & Reproducibility: Consistent results.

