



Introduction to **SPERM HY-LITER™** for Forensic DNA Laboratories

Monoclonal Antibody-Based
Fluorescent Detection of Human Sperm
from Sexual Assault Evidence

SPERM HY-LITER™



Forensic DNA laboratory

Accreditations: ISO 17025, NY-DOH, AABB, CLIA

Specialize in LCN / Trace Protocols
Profiles from < 0.1 ng

Products for Forensic Laboratories

Contract R & D

Laboratory personnel: MS and Ph.D. scientists

5,600 sq ft of combined laboratory and office space

Suburban Chicago – 18 minutes from O’Hare
– 30 minutes from The Loop



R & D contract from Federal Law Enforcement Agency

Lateral Flow Immunochromatographic Strip Tests

RSID™-SEMEN

RSID™-SALIVA

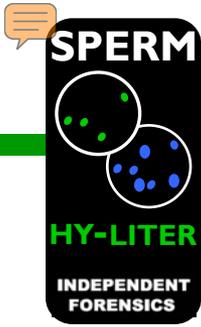
RSID™-BLOOD

Fluorescent Detection of Sperm from Sexual Assault evidence

SPERM HY-LITER™

SPERM TELLIGENCE™





SPERM HY-LITER™

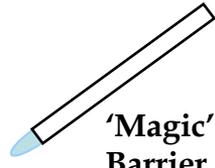
| | |
|--------------------------|---|
| Test Format: | Microscopic Screening Method for Sperm |
| Antigen Detected: | Human Sperm Heads |
| Antibodies: | Mouse monoclonal |
| Labeling: | Sperm: Alexa 488 / Nuclei: DAPI |
| Sensitivity: | Single Human Sperm Head |
| Cross-reaction: | None detected - <i>Homo sapiens</i> specific |
| Test Read-out: | Visual |
| Preparation Time: | 100 minutes - 10 minutes 'hands-on' |



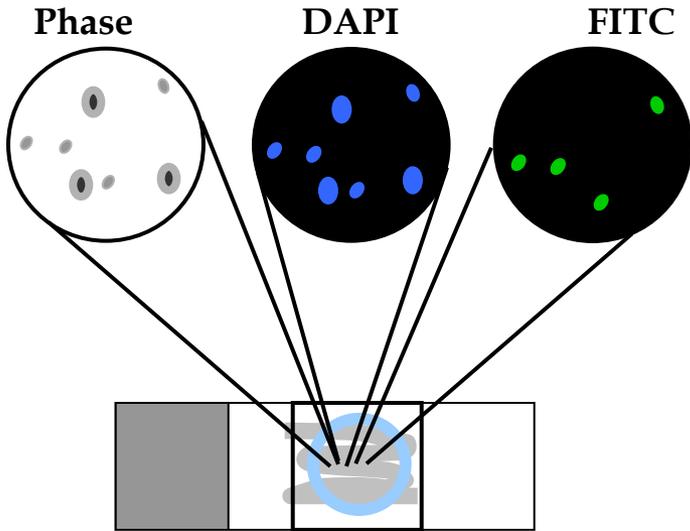


SPERM HY-LITER™

Sexual Assault
Smear Slide



'Magic' Hydrophobic
Barrier Ring Marker



Stained, Mounted
Cover Slipped Slide

Step 1:



Fix
Permeabilize
10 min



Step 2:



Sample
Preparation
30 min



Step 3:



Blocking
Solution
30 min



Step 4:



Sperm
Staining
30 min

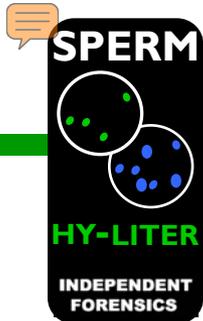


Step 5:



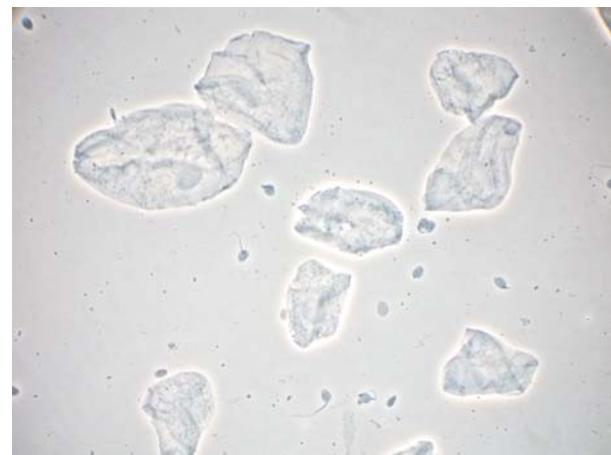
Mounting
Media
1 min





SPERM HY-LITER™

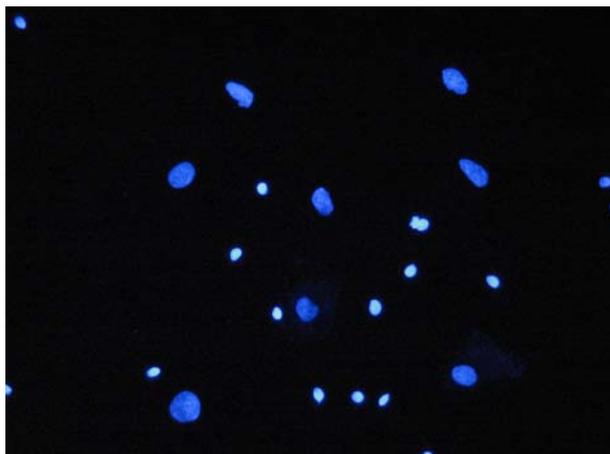
Phase Contrast



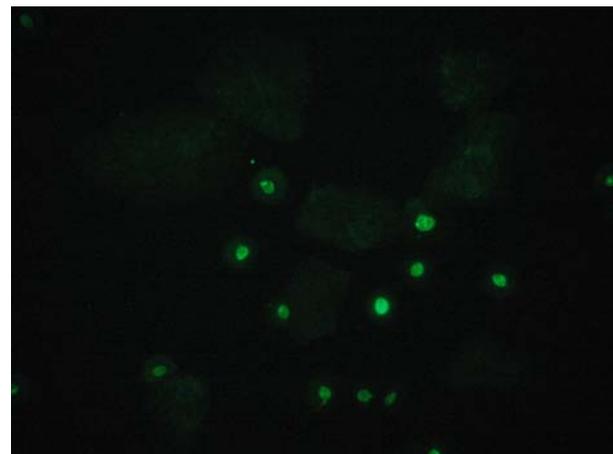
SPERM HY-LITER™ staining

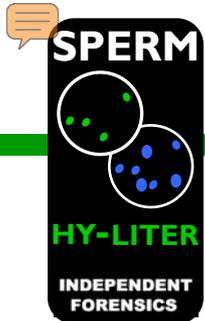
Cell Type Specificity
Buccal Extract, Smear slide
with Sperm

DAPI Filter



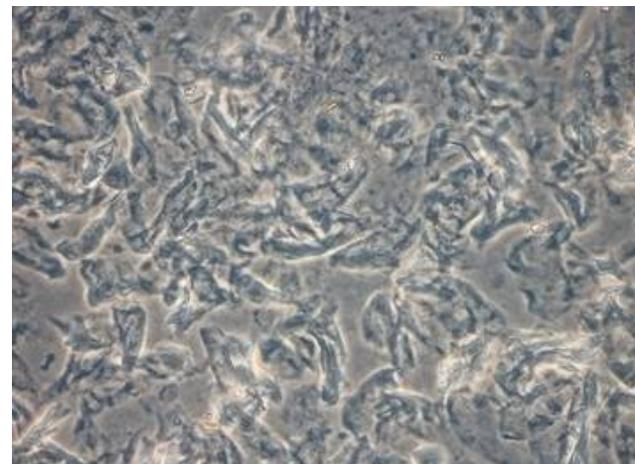
FITC Filter





SPERM HY-LITER™

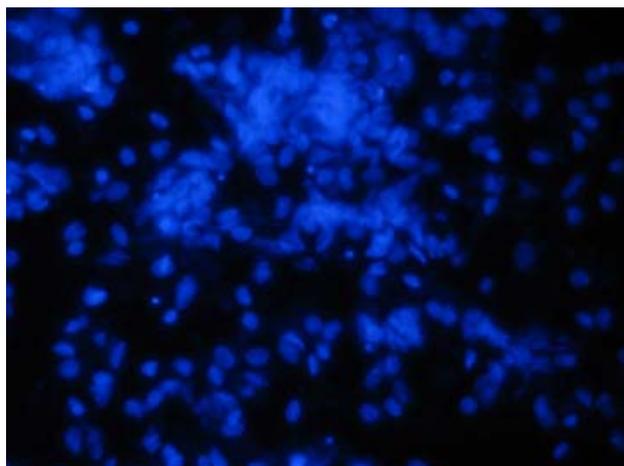
Phase Contrast View



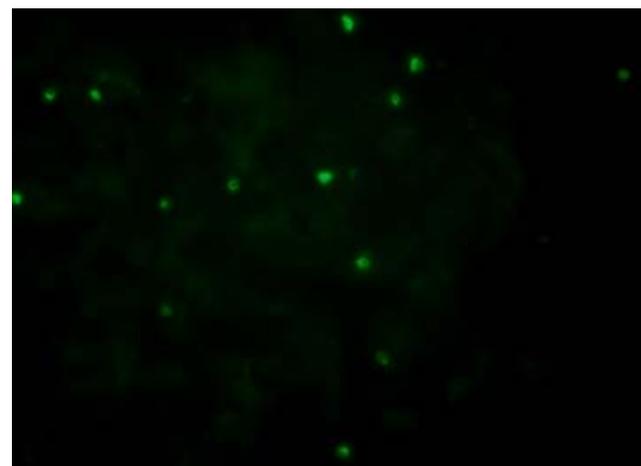
SPERM HY-LITER™ staining

Cell Type Specificity
Post-Coital Sample, Smear slide
with Sperm

DAPI Filter



FITC Filter





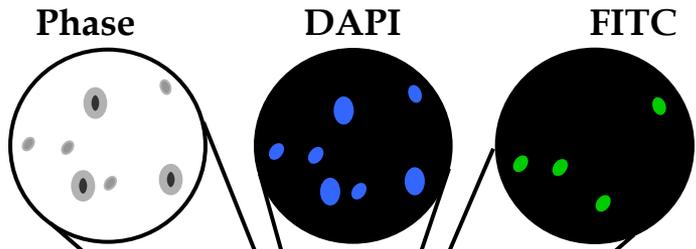
SPERM HY-LITER™



Two Position Masked Slide



Extract from Sexual Assault Evidence



Stained, Mounted Cover Slipped Slide

Step 1:



Fix
Permeabilize
10 min



Step 2:



Sample
Preparation
30 min



Step 3:



Blocking
Solution
30 min



Step 4:



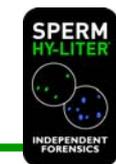
Sperm
Staining
30 min

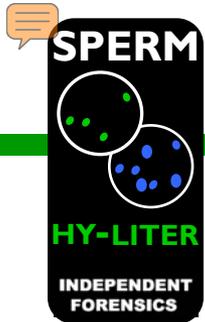


Step 5:



Mounting
Media
1 min





SPERM HY-LITER PLUS™

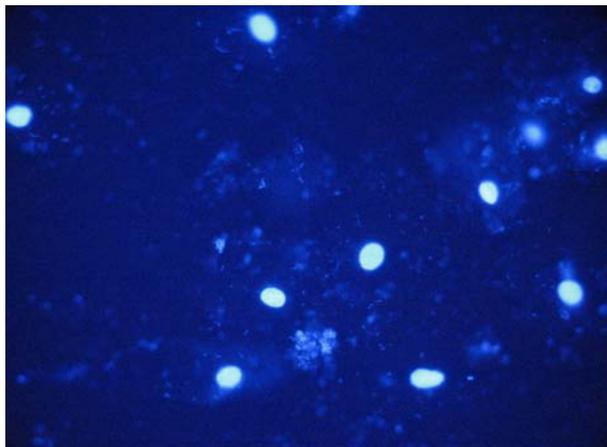
Phase Contrast



SPERM HY-LITER PLUS™ staining

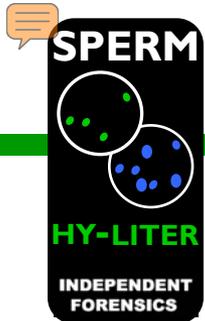
Cell Type Specificity
Buccal, Urine & Blood extracts
without Sperm

DAPI Filter



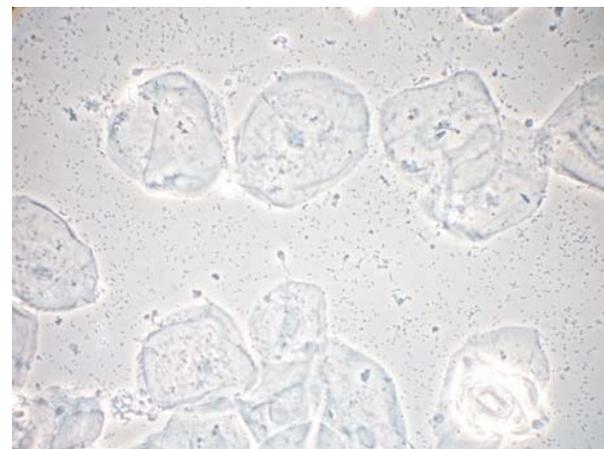
FITC Filter





SPERM HY-LITER™

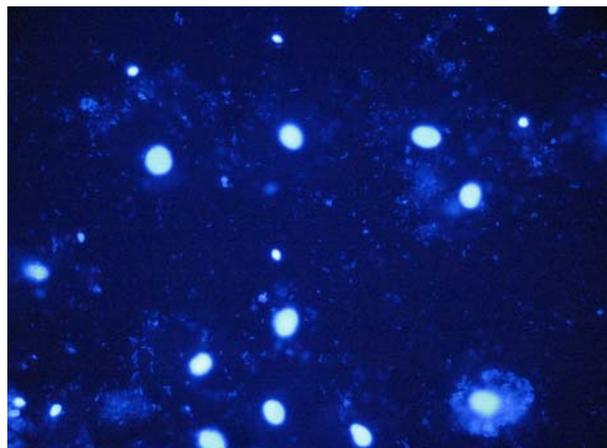
Phase Contrast



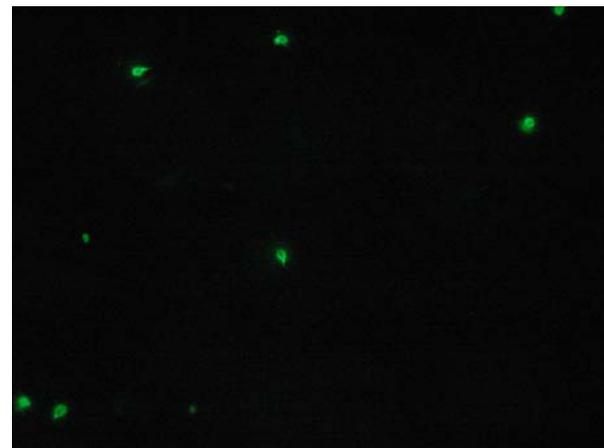
SPERM HY-LITER™ staining

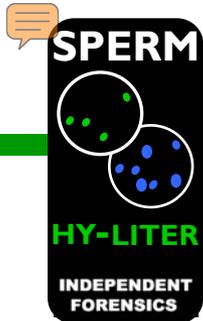
Cell Type Specificity
Buccal, Urine & Blood extracts
with Sperm

DAPI Filter



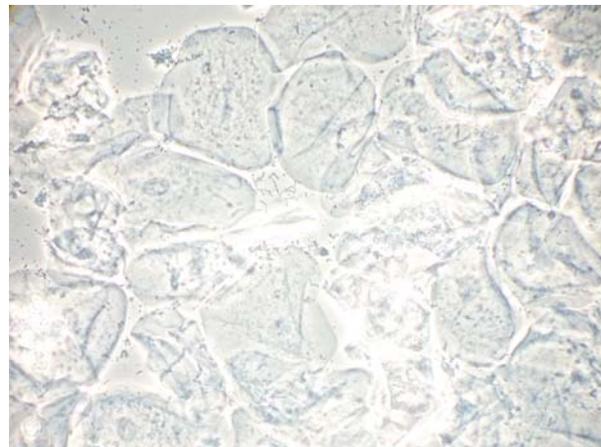
FITC Filter





SPERM HY-LITER™

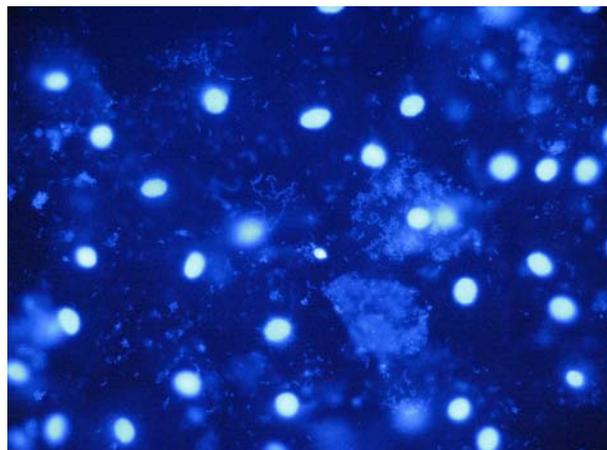
Phase Contrast



SPERM HY-LITER™ staining

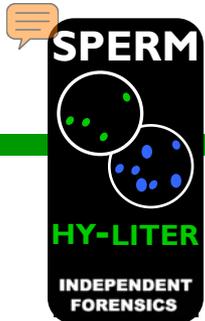
Sensitivity & Specificity
Buccal, Urine & Blood Extracts
Down to a Single Sperm

DAPI Filter



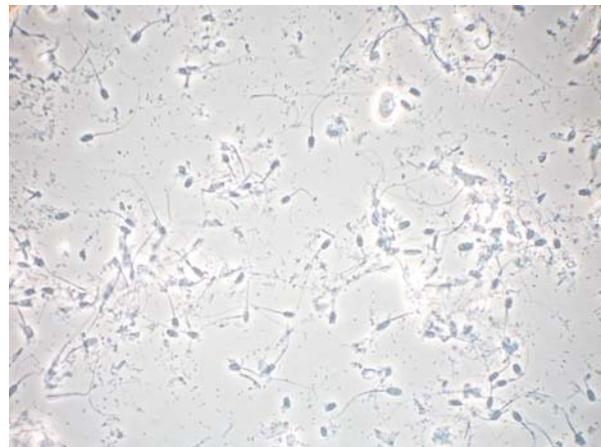
FITC Filter





SPERM HY-LITER PLUS™

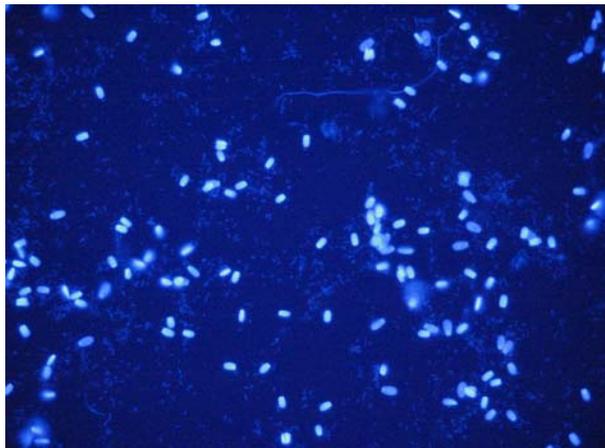
Phase Contrast



SPERM HY-LITER™ staining

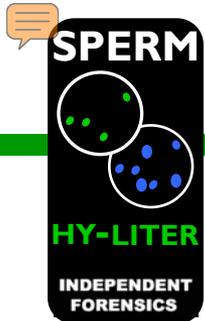
Species Specificity
Animal Semen (various)
without Human Semen

DAPI Filter



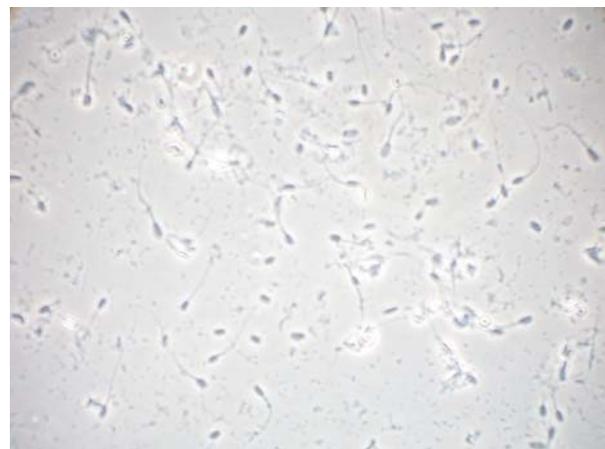
FITC Filter





SPERM HY-LITER™

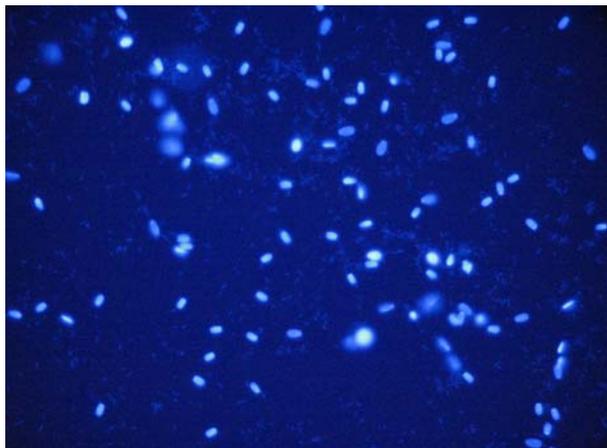
Phase Contrast



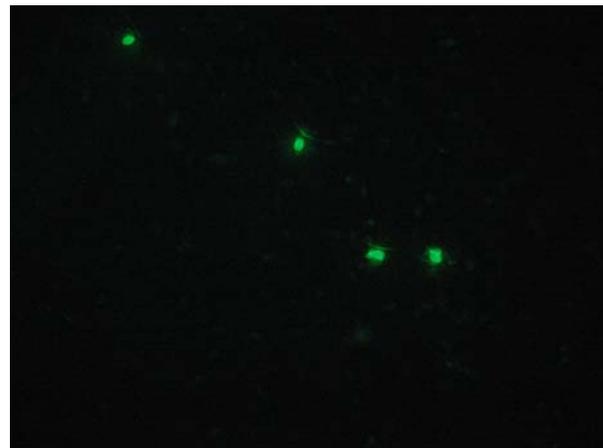
SPERM HY-LITER™ staining

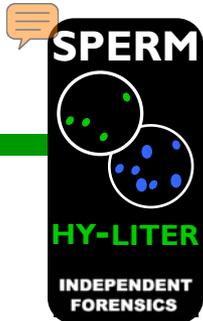
Species Specificity
Animal Semen (various)
with Human Semen

DAPI Filter



FITC Filter





First *Positive* Identification for Human Sperm

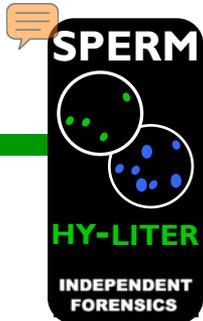
First *Specific* Identification for Human Sperm

Sensitivity down to a single sperm

Fully Compatible with Automated Methods

Scan slides at lower magnification: 100X or 200X





Ideal for *both* smear and extract slides

Does not obscure or destroy morphology, if present

Does not interfere with DNA extraction, PCR
or DNA-STR analysis

Forty-one (41) installs, thirteen validations (13) and
four (4) released for case work (as of 3/2010)
and counting!





Acknowledgements:

SPERM HY-LITER™

Jennifer Old, Ph.D.

Brett Schweers, Ph.D.

P.W. Boonlayangoor, Ph.D.

Chicago

Liz Graffy, MS

Marisa Farhner, M.S



| Test For | Current | Issue/Problem |
|----------|-------------------|---------------------------|
| Semen | p30/PSA | specificity / sensitivity |
| Blood | hemoglobin | specificity |
| Saliva | amylase activity | specificity |
| Sperm | KPIC / morphology | specificity / sensitivity |

| Test For | New | Issue/Problem |
|----------|-----------------------------------|---------------|
| Semen | RSID-SEMEN™ semenogelin | Solved |
| Blood | RSID-BLOOD™ glycophorin A | Solved |
| Saliva | RSID-SALIVA™ α-amylase | Better |
| Sperm | SPERM HY-LITER™ sperm head | Solved |





Questions

Comments

Samples

Gripes

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