



ASRM 2025

Global Collaboration to
Advance Reproductive Health



Phosphatidylserine Positive Live Sperm (PS Score) Demonstrates Superior Stability Compared to Conventional Semen Analysis Metrics

Dr. Cassandra Lyons

Disclosures & Acknowledgments



- Instructions for slide:
 - MUST BE LISTED OUT IN TEXT
 - **NO LOGOS** ARE PERMITTED AS IT IS A VIOLATION OF ACCME REQUIREMENTS
 - IF YOU HAVE NO DISCLOSURES, INCLUDE "NOTHING TO DISCLOSE." DO NOT REMOVE SLIDE. Acknowledgements

The Problem



The basic semen analysis does NOT do a great job of predicting fertility

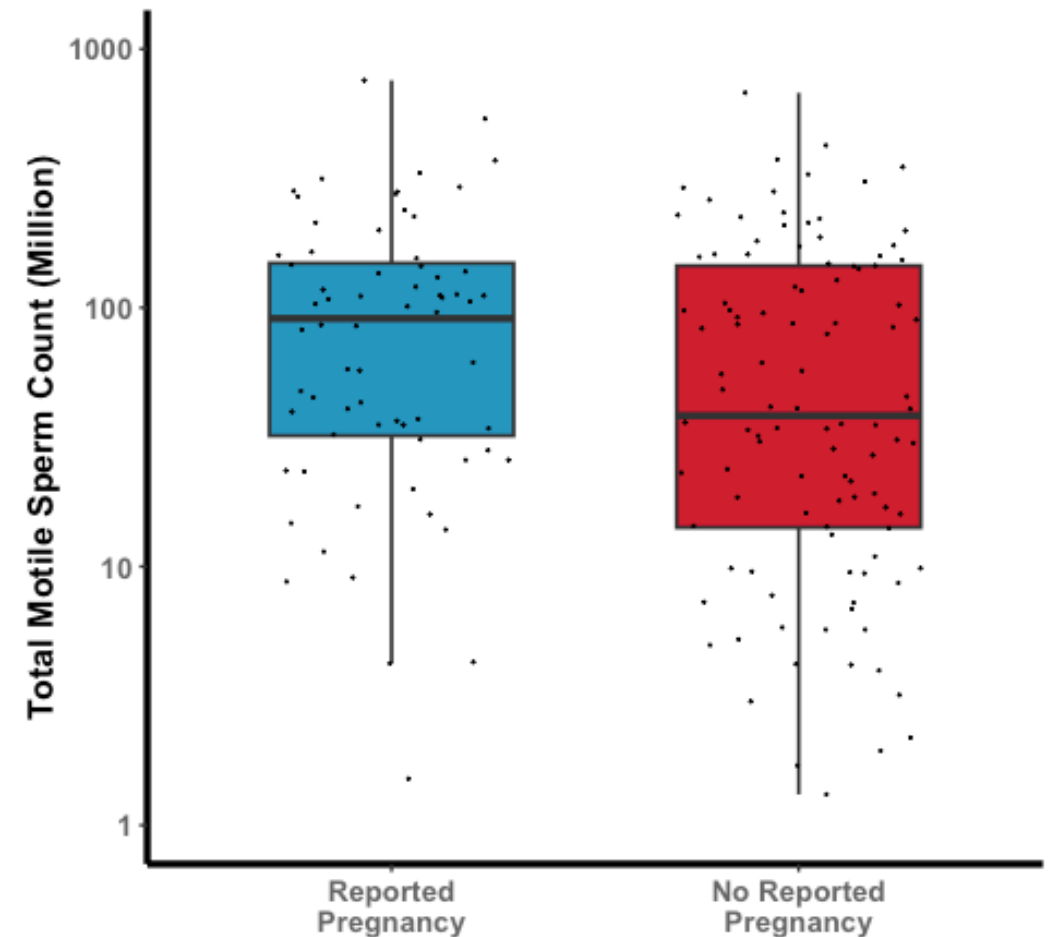
Can semen parameters predict pregnancy outcomes?

Dolores J. Lamb, Ph.D. and Jessica A. Marinaro, M.D.

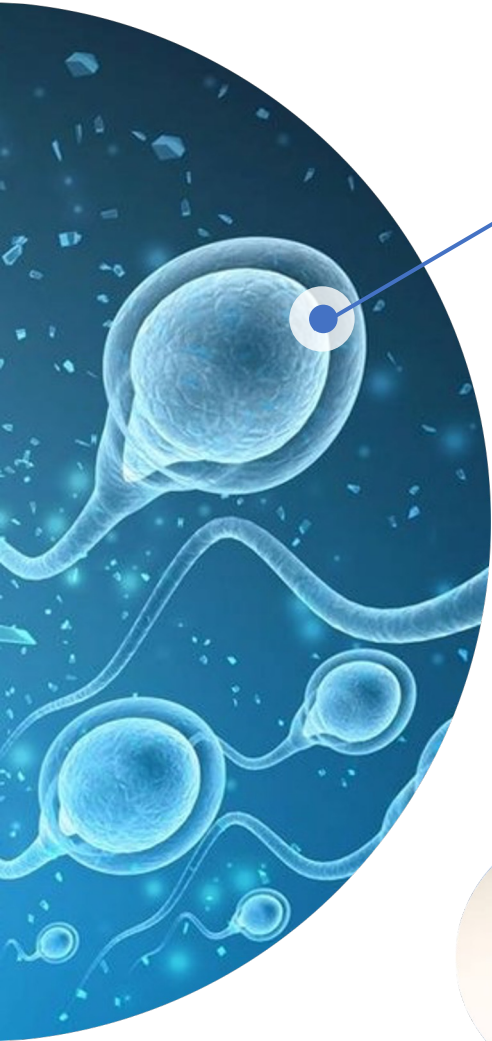
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Semen analysis is an integral component of the evaluation and management of men with infertility. Although it is important for patient counseling and clinical decision making, a conventional semen analysis cannot reliably predict the chance of pregnancy or differentiate fertile vs. infertile men (except in the most extreme cases). Advanced, nonstandard sperm functional tests may provide additional discriminatory and prognostic power; however, further research is needed to determine how to best incorporate these tests into modern clinical practice. Therefore, the primary applications of a conventional semen analysis should be to judge the severity of infertility, estimate the effects of future therapy, and measure the response to current therapy. (Fertil Steril® 2023;120:709–14. ©2023 by American Society for Reproductive Medicine.)

Key Words: Semen analysis, pregnancy, male infertility



Our Discovery



Breakthrough discovery by researchers at UVA found that phosphatidylserine (PS) on sperm is essential for sperm-egg fusion

PUBLISHED FINDINGS

Rival et al., Nature Communications 2019

- 1 PS must be exposed on outside of sperm for fertilization to occur
- 2 Masking PS on sperm inhibits fertilization
- 3 PS receptors on egg contribute to fertilization



Kodi Ravichandran, PhD

Co-founder

- One of the world's top researchers on cellular fusion
- Professor of Pathology and Immunology at Wash Univ.

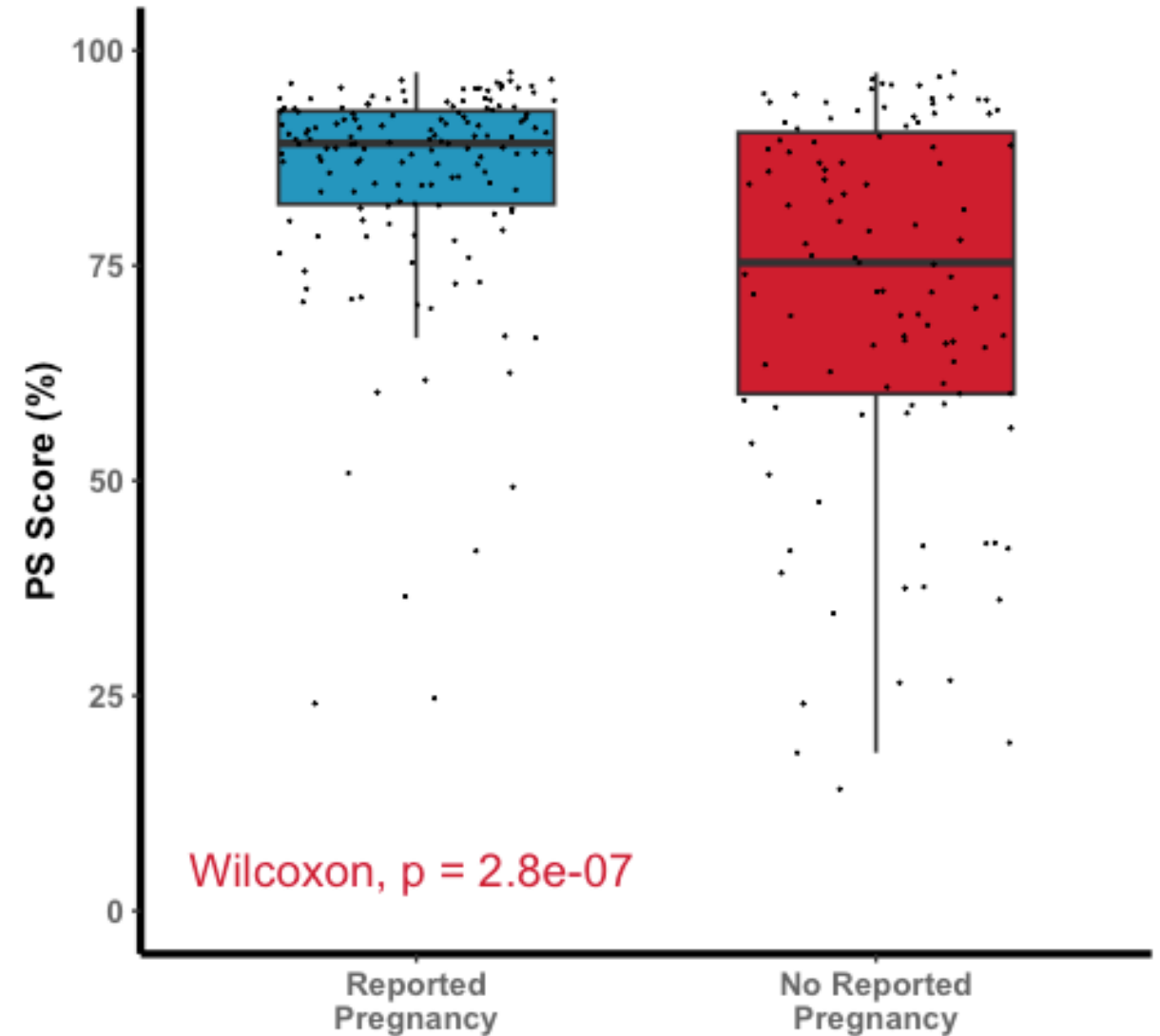
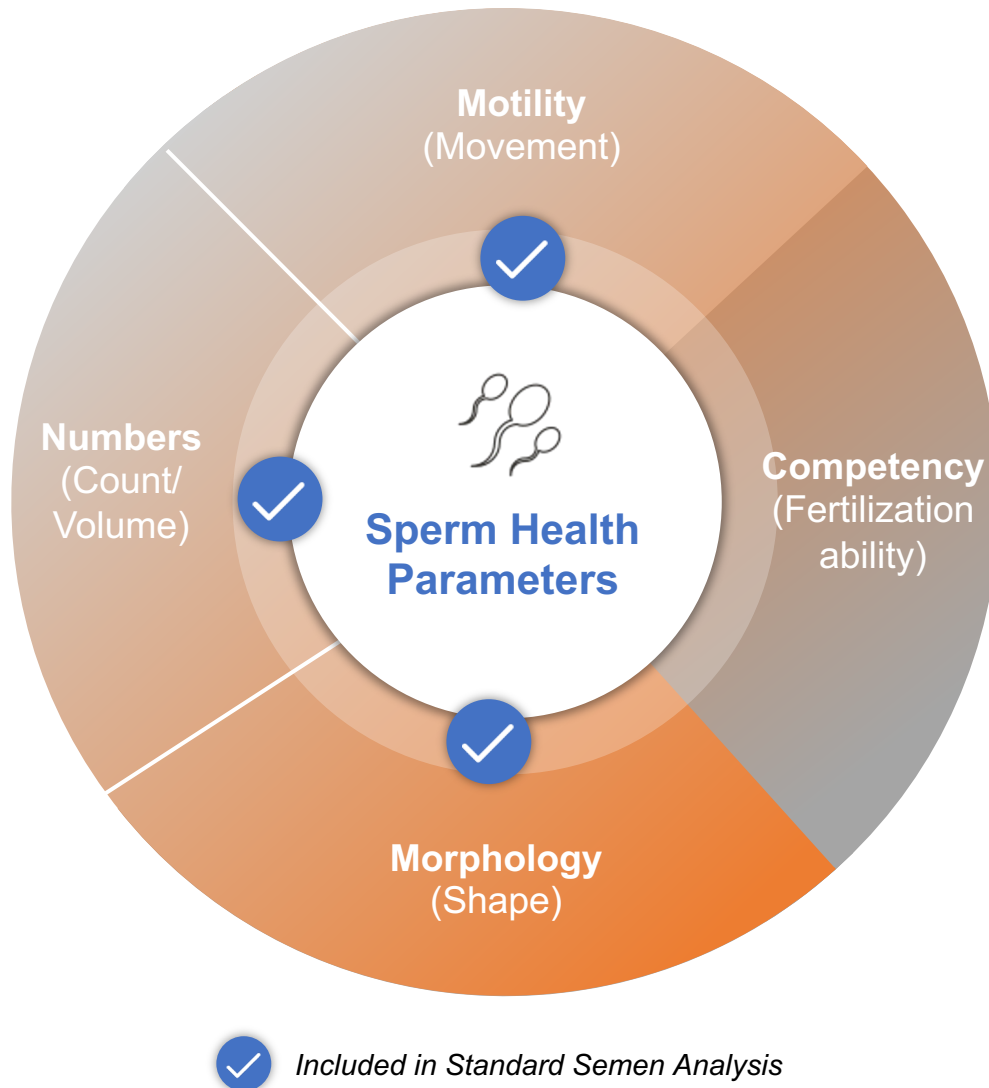


Jeff Lysiak, PhD

Co-founder, CSO

- Former UVA Professor of Urology
- Over 60 peer reviewed publications
- Expert in Mammalian Spermatogenesis

Introducing PS Detect

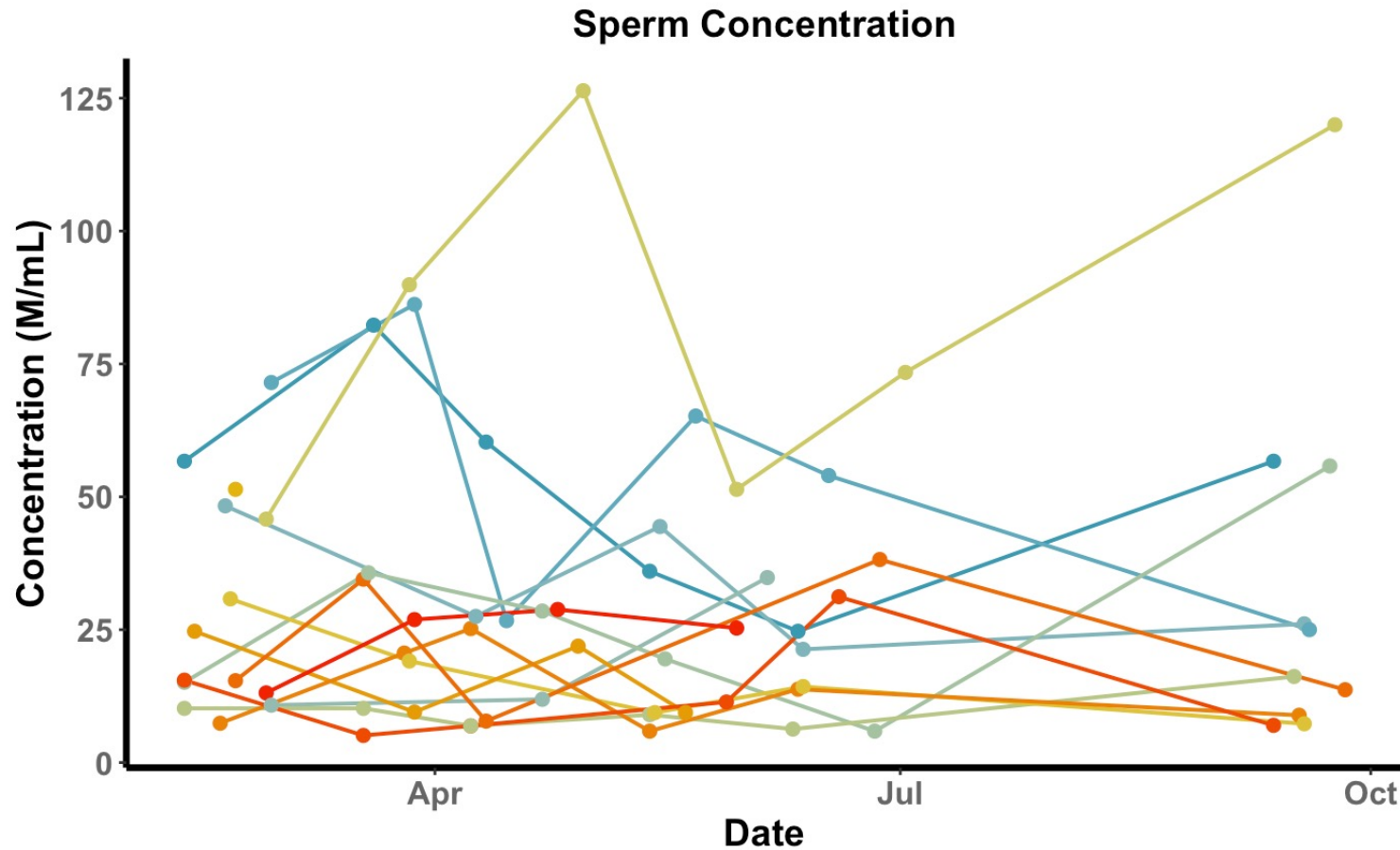


Study Design



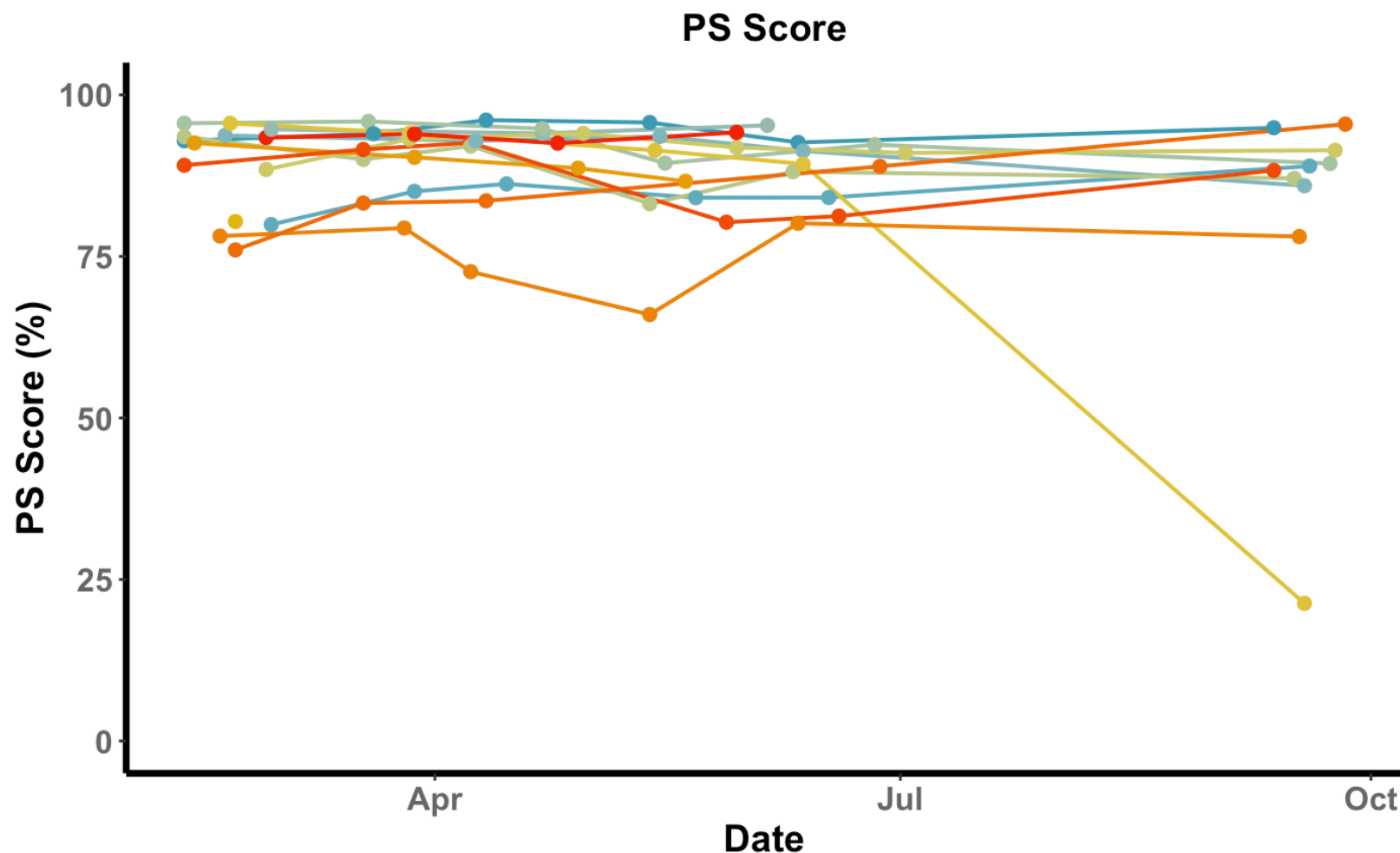
- Recruited 14 IRB-approved participants to provide one semen sample every month
- 13/14 participants reported achieving unassisted pregnancy within one year of trying
- Each month the participant also fills out a health questionnaire before providing their sample
- A new sample collection kit is mailed to each participant each month and their samples are received and analyzed

Semen Analysis Stability



- Mean SD = 14 M/mL
- Median SD = 14 M/mL
- Mean %CV = 51%
- Median %CV = 49%

PS Score Stability



- Mean SD = 5%
- Median SD = 3%
- Mean %CV = 7%
- Median %CV = 4%

Conclusion



1. The flipping of PS from the inner cell membrane to the outer occurs as sperm transit and mature in the epididymis. These results possibly suggest that unlike the variability in sperm numbers and morphology that occur in the testes, epididymal induced changes may be more consistent.
2. Examining for PS expression on live sperm may only require one sample unlike repeated samples for the basic semen analysis.

References



- Rival CM, Xu W, Shankman LS, et al. Phosphatidylserine on viable sperm and phagocytic machinery in oocytes regulate mammalian fertilization. *Nat Commun.* 2019;10(1):4456.
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