



OSAC Research Needs Assessment Form

Title of research need: To Improve the Analysis of Serological Evidence: ID of Body Fluid

Keywords: Body Fluid Stains, Serology, Saliva, Semen, Blood

Submitting subcommittee(s): Biological Methods SC - DNA **Date Approved:** 1/28/16

(If SAC review identifies additional subcommittees, add them to the box above.)

Background information:

1. Description of research need:

Considerable research has been conducted to improve DNA analysis techniques but little has changed for the front end, the classical serological analysis of evidence. Research is underway to make improvements but the emphasis of the NIJ research portfolio should address the need to make real transformational change to how evidence is examined. It would be beneficial to add methods which would decrease the serological analysis time on items like sheets, clothing, etc.

2. Key bibliographic references relating to this research need:

- Saferstein, Richard. *Criminalistics: An Introduction to Forensic Science*. Prentice Hall, 1998.
- Gaensslen, R. E. *Sourcebook in Forensic Serology, Immunology and Biochemistry* (Gaensslen, R. E., Ed.) NIJ
- Adams, E.G. et al. "Phosphatases in body fluids: the differentiation of semen and vaginal secretions." *Forensic Science* 3: 57-62.
- Aksoy, J. & et. al. "Changes of PSA concentrations in serum and saliva of healthy women during the menstrual cycle." *Annals of Clinical & Laboratory Science*, 32(1) (2002): 31-36
- Hanson EK and Ballantyne J. Rapid and inexpensive body fluid identification by RNA profiling-based multiplex High Resolution Melt (HRM) analysis [version 2; referees: 2 approved]. *F1000Research* 2014, 2:281 (doi: 10.12688/f1000research.2-281.v2)

3a. In what ways would the research results improve current laboratory capabilities?

Numerous corrective action reports are generated in laboratories each year concerning examiners who have not identified certain biological stains after a reanalysis revealed the missed stain. Examination of large or even small items can be time consuming and labor intensive. Technology that could assist in the localization of potential stains would be a great assistance to the community.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

Streamlined serological analysis, more definitive answers associated with a potential body fluid for enhanced laboratory capabilities and capacity.

3c. In what ways would the research results improve services to the criminal justice system?

Quicker turn-around time for analysis, more definitive answers associated with a potential body fluid which leads to more appropriate planning when it comes to DNA typing or the application of specific DNA technologies. Enhanced laboratory capabilities and capacity.

4. Status assessment (I, II, III, or IV): II

| | Major gap in current knowledge | Minor gap in current knowledge |
|---|--------------------------------|--------------------------------|
| No or limited current research is being conducted | I | III |
| Existing current research is being conducted | II | IV |

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Subcommittee

Approval date: 1/28/16

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SAC

1. Does the SAC agree with the research need? Yes No

2. Does the SAC agree with the status assessment? Yes No

If no, what is the status assessment of the SAC:

Approval date: 3/11/2016

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)