

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need:

Describe the need:

Keyword(s):

Submitting subcommittee(s): **Date Approved:**

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

Yes, this research need addresses the secondary transfer of pGSR particles after their original deposition on a surface. There is a need to understand the rate and level of transfer from person to person, from person to surface (e.g. clothing, vehicles), and from surface to surface at various time intervals. This research need should investigate whether the study can provide statistical data to establish a likelihood ratio. This likelihood ratio of secondary transfer may be subject to the results of a persistence study. The researcher(s) should have experience and access to validated instrumentation using automated GSR software followed by manual confirmation of GSR particles by Scanning Electron Microscopy and Energy Dispersive X-Ray analysis. The research will require extensive statistical capabilities/support.

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

[1] R. Berk, S. Rochowicz, M. Wong, and M. Kopina. GSR in Chicago Police Vehicles and Facilities: An Empirical Study. *J. Forensic Sci.* 2007, 52, 838.

[2] Z. Brozek-Mucha. Chemical and Morphological Study of Gunshot Residue Persisting on the Shooter by Means of Scanning Electron Microscopy and Energy Dispersive X-ray Spectrometry. *Microsc. Microanal.* 2011, 17, 972.

[3]. Charles and N. Geusens. A Study of Potential Risk of Gunshot Residue Transfer from Special Units of the Police to Arrested Suspects. For. Sci. Int. 2012, 216, 78.

[4] J. French, R. Morgan, and J. Davy. The Secondary Transfer of Gunshot Residue: An Experimental Investigation Carried out with SEM-EDX Analysis. X-Ray Spectrometry, 2014, 43, 56.

[5] J. French, and R. Morgan. An Experimental Investigation of the Indirect Transfer and Deposition of Gunshot Residue: Further Studies Carried out with SEM-EDX Analysis. For. Sci. Int., 2015, 247, 14.

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at <https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest>? Is your research need identified by NIJ?

No.

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

The research may give insight into the future need for pGSR collection and analysis. The research results will guide evolution in laboratory practice, report writing, and testimony.

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

The research results would assist the subcommittee in developing modifications of laboratory practice/procedure, report writing, and testimony; these changes will be data driven.

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

This research will help to establish the relevance of pGSR analysis in the prosecution of firearms related incidents. A statistical model may give more of a relative timeline for firearms related incidents. This study will help to enhance the confidence of pGSR interpretation.

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

I

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