OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Prevalence of Characteristic and Consistent GSR Particles

Keyword(s): Gunshot Residue, GSR, Primer residue, Prevalence

Submitting subcommittee(s): Ignitable Liquids, Explosives, & Gunshot Residue

Date Approved: 3/02/2021

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

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 prevalence of characteristic and consistent GSR particles in the United States (US) population. There has long been a need for a large scale study on the prevalence of GSR particles, both characteristic of and consistent with, on persons in the US. Many studies have been performed in various countries, but the difference in gun laws and firearm usage around the world limit the application of these studies from country to country. Data is needed both from people with no known association to firearms, and people with known associations to firearms (through employment or personal use). A study (or studies) is needed which allows for the evaluation of the probability of finding characteristic or consistent GSR particles on the hands of an individual not associated with a shooting event. The applicant must have experience and access to instrumentation using automated GSR software followed by manual confirmation of GSR particles by Scanning Electron Microscopy and Energy Dispersive X-Ray analysis.

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)?

No.

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)

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[2] 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.

[3] Z. Brozek-Mucha. On the Prevalence of Gunshot Residue in Selected Populations – An Empirical Study Performed with SEM-EDX Analysis. For. Sci. Int. 2014, 237, 46.

[4] S. 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.

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[6] D. Gialamas, E. Rhodes, and L. Sugarman. Officers, Their Weapons and Their Hands: An Empirical Study of GSR on the Hands of Non-Shooting Police Officers. J. For. Sci. 1995, 40, 1086.

[7] N. Lucas, H. Brown, M. Cook, K. Redman, T. Condon, H. Wrobel, K. Kirkbride, and H. Kobus. A Study into the Distribution of Gunshot Residue Particles in the Random Population. For. Sci. Int. 2016, 262, 150.

[8] A. Stamouli, L. Niewöhner, M. Larsson, B. Colson, S. Uhlig, L. Fojtasek, F. Machado, L. Gunaratnam. Survey of Gunshot Residue Prevalence on the Hands of Individuals from Various Population Groups In and Outside Europe. Forensic Chemistry. 2021, 23, 100308.

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 results would improve the ability of laboratories to provide meaningful interpretation of gunshot residue test results.

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

The research results would improve the understanding of how commonly one could expect to find gunshot residue particles on a person in the US population. This will improve the understanding of the probative value of gunshot residue test results.

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

The research results would allow for a more meaningful interpretation of gunshot residue test results in reports and in courts of law. This will have the potential to increase the amount of information an investigator or court can gain from gunshot residue test results.

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

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