OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need:	Report and Testimony Language of Probabilistic Results for Firearm Forensics
Keywords:	Firearms and toolmarks, strength of evidence,

R&D Need Rank: Low, Medium, High	High	**SAC Approved Date:**	9/3/2025

Submitting subcommittee(s): Firearms & Toolmarks

Research Need Summary:

The purpose of these research needs is to build a stronger scientific foundation for forensic science standards. The information provided herein will help to evaluate and strengthen existing standards, and/or fill any standards related gaps. In the space below, please provide a brief narrative of the need to be addressed. This should include:

- The identity of any specific standards that would be affected/improved/evaluated
- A discussion on gaps that exist within the standards or standards related gaps that need to be filled
- How this work would fill those gaps
- An overview of any current or past research efforts that may be relevant to this effort
- A discussion regarding how this research might improve current laboratory capabilities and/or forensic services within the criminal justice system
- Any relevant references

Some articles and publications have suggested forensic results should be expressed using actual or conceptual likelihood ratios as a foundation, as both an evaluative framework and guide for the expression of forensic conclusions. Research should study the trier of fact (i.e., jurors) and legal perception of this approach, again comparing it to traditional forensic language.

Research can also focus on the expression of score-based (i.e., algorithm) results, and the best, accurate, and most understood expression of these results with a focus on lay-person/juror comprehension.

References (not intended to be a comprehensive list on this topic):

- Arscott, E., Morgan, R., Meakin, G., & French, J. (2017). Understanding forensic expert evaluative evidence: A study of the perception of verbal expressions of the strength of evidence. Science and Justice, 57(3), 221–227.
- Eldridge H (2019) Juror comprehension of forensic expert testimony: A literature review and gap analysis. Forensic Sci International: Synergy 1 24-34.
- Evett IW, Jackson G, Lambert JA, McCROSSAN S. The impact of the principles of evidence interpretation on the structure and content of statements. (2000) Science & Justice 40(4) 233-239.
- Thompson, WC, Grady RH, Lai E, Stern HS. (2018) Perceived strength of forensic scientists' reporting statements about source conclusions. Law, Probability and Risk (2018) 17, 133–155

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