



# NATIONAL COMMISSION ON FORENSIC SCIENCE

**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce

## Scientific Literature in Support of Forensic Science and Practice

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### **Commission Action:**

On January 30, 2015, the Commission voted unanimously to adopt this work product.

### **Type of Work Product:**

Views Document issued by the Scientific Inquiry and Research Subcommittee

### **Statement of the Issue**

It is the view of the National Commission on Forensic Science (NCFS) that each forensic discipline must have an underlying foundation that is the result of a rigorous vetting process and that is ultimately captured in the peer-reviewed scientific literature. Scientific literature comprises manuscripts that report empirical data and have been independently peer-reviewed for quality, originality, and relevance to the discipline. To strengthen confidence in results obtained in forensic examinations, each forensic discipline must identify resources that are scientifically credible, valid and with a clear scientific foundation. Such foundational literature in forensic practice should conform to norms across all scientific disciplines. Accordingly, the National Commission on Forensic Science (NCFS) proposes criteria by which scientific literature can be assessed for its consistency with principles of scientific validity.

### **Background**

Congress called for the establishment of an independent forensic science committee at the National Academy of Sciences to assess the state of forensic sciences in the United States in 2006. The National Academy of Sciences Committee met for nearly two years (2007-2008) and summarized its findings in a report “*Strengthening Forensic Science in the United States: A Path Forward* (National Research Council, 2009).”<sup>1</sup> During an April 23-24, 2007 committee session titled *Identifying the Needs of the Forensic Community*, the agenda included a segment on “The State of Forensic Disciplines” in which the following questions were addressed<sup>2</sup>: What is the state of the art? Where is research conducted? Where is it published? What is the scientific basis that informs the interpretation of the evidence? Where are advancements coming from? What are the major hurdles in the scientific foundation or methods and in the practice? What research questions would you like to have answered?”<sup>2</sup>

The results of this inquiry were described in the NRC report, specifically that there was “a notable dearth of peer-reviewed, published studies establishing the scientific bases and validity of many forensic methods<sup>3</sup>.” The term “foundation” was used no less than thirty times to emphasize that each forensic discipline must have a scientifically robust and validated basis to its methods, its technologies, and its process of interpreting data.

In response to the National Research Council report regarding foundational forensic science research, an Interagency Working Group—the Research Development Technology and Evaluation (RDT&E) of the National Science and Technology Council’s Subcommittee on Forensic Science was assembled and chartered with the “identification of foundational research that can be mapped to specific principles across the various disciplines of forensic science...”<sup>4</sup> The RDT&E committee tasked Scientific Working Groups (SWG) with addressing a series of discipline-specific questions. In response, literature compendiums were submitted to the RDT&E committee by several forensic working groups. A cursory review of the literature citations raised concerns within the NCFS that extend beyond these specific bibliographies:

1. In some cases, it was unclear which literature citations are crucial to support the foundation of a particular forensic science discipline.
2. Some of the cited literature had not undergone a rigorous peer-review process.

The goal of this Views document is to provide the framework necessary to address these and broader concerns regarding the status of the scientific foundation of forensic science across its many disciplines and practices.

### **View of the National Commission on Forensic Science**

The NCFS believes that a comprehensive evaluation of the scientific literature is critical for the advancement of forensic science policy and practice in the United States. While other forms of dissemination of research and practice (e.g., oral and poster presentations at meetings, workshops, personal communications, editorials, dissertations, theses, and letters to editors) play an important role in science, the open, peer-reviewed literature is what endures and forms a foundation for further advancements. As stated by the National Research Council:

*“Journal publication, traditionally an important means of sharing information and perspectives among scientists, is also a principal means of establishing a record of achievement in science.”<sup>5</sup>*

This report further discusses the importance of issues surrounding potential conflicts of interest as it relates to peer review and publication practices:

*“Disclosure, either public or institutional, is essential to controlling conflict of interest, and some universities and scientific journals prohibit certain forms of commercial contractual arrangements by their members or authors. But the responsibility for such disclosure rests with scientists themselves.”<sup>6</sup>*

Given this background and considerations, it is the position of the NCFS that foundational, scientific literature supportive of forensic practice should meet criteria such as the following:

- Peer-reviewed in the form of original research, substantive reviews of the original research, clinical trial reports, or reports of consensus development conferences.
- Published in a journal or book that has an International Standard Number (ISSN for journals; ISBN for books) and recognized expert(s) as authors (for books) or on its Editorial Board (for journals).

- Published in a journal that maintains a clear and publicly available statement of purpose that encourages ethical conduct such as disclosure of potential conflicts of interest integral to the peer review process<sup>7</sup>
- Published in a journal that utilizes rigorous peer review with independent external reviewers to validate the accuracy in its publications and their overall consistency with scientific norms of practice.
- Published in a journal that is searchable using free, publicly available search engines (e.g. PubMed, Google Scholar, National Criminal Justice Reference Service) that search major databases of scientific literature (e.g. Medline, National Criminal Justice Reference Service Abstracts Database, and Xplore).
- Published in a journal that is indexed in databases that are available through academic libraries and other services (e.g. JSTOR, Web of Science, Academic Search Complete, and SciFinder Scholar).

### **Citations**

- 1) "Strengthening Forensic Science in the United States: a Path Forward" (2009). The National Academies Press.
- 2) "Strengthening Forensic Science in the United States: a Path Forward" (2009). The National Academies Press. Appendix B
- 3) "Strengthening Forensic Science in the United States: a Path Forward" (2009). The National Academies Press, P.8
- 4) National Science and Technology Council Committee on Science Subcommittee on Forensic Science, May 2, 2014 Office of Science & Technology Policy
- 5) National Research Council. "Responsibility in Science. Volume 1. Ensuring the Integrity of the Research Process" (1992). The National Academies Press, p. 52
- 6) National Research Council. "Responsibility in Science. Volume 1. Ensuring the Integrity of the Research Process" (1992). The National Academies Press, p. 78-79.
- 7) National Research Council. "Responsibility in Science. Volume 1. Ensuring the Integrity of the Research Process" (1992). The National Academies Press, p. 141.