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May 8, 2014

Patrick D. Gallagher

Director

National Institute of Standards and Technology

100 Bureau Dr.

Gaithersburg, MD 20899

Re: Functional Analysis of Subcommittee Composition and SAC/Sub Leadership

Dear Director Gallagher:

In its 2009 report, *Strengthening Forensic Science*, the National Research Council (NRC) envisioned a framework for improving the practice of forensic science in the United States, one with “a culture that is strongly rooted in science”; one that is not “encumbered by the assumptions, expectations, and deficiencies of the existing fragmented infrastructure, which has failed to address the needs and challenges of the forensic science disciplines.” *Id.* at 18. They emphasized that this reform effort “must not be in any way committed to the existing system, but should be informed by its experiences.” *Id.* at 19.

Specifically, the NRC committee recommended that the National Institute of Standards and Technology (NIST) facilitate this reform effort by working with public and private laboratories and universities to develop “best practice” standards related to “measurement, validation, reliability, information sharing, and proficiency testing in forensic science and to establish protocols for forensic examinations, methods, and practices.” *Id.* at 24-25. In order to ensure that this collaborative effort was “informed by the experiences” of the existing forensic science system, the NRC also recommended that NIST “consult” with Scientific Working Groups (SWGs). *Id.*

The National Association of Criminal Defense Lawyers (NACDL) appreciates that the mantle laid upon NIST—to help instill a culture of science in forensic practice—is a heavy one. NIST has already taken important first steps by outlining a structure for achieving this objective: the Organization of Scientific

Area Committees (OSAC), a four-tiered organization for standards development. It now seeks to populate this organization with the right combination of experts to achieve the ultimate goal of developing a body of documentary standards for each forensic discipline that is supported by methodologically-rigorous scientific evidence, that allows for as much objectivity as possible in application, and that will thus guide practitioners in their analyses toward reliable and trustworthy results.

The foundations of the OSAC—the entities that will be doing the “real work” of actually developing documentary standards for review by other tiers of the organization—are the discipline-specific subcommittees. At the first public meeting of the National Forensic Science Commission, NIST invited those assembled to provide a functional analysis of the expertise necessary to make the subcommittees successful, and NACDL welcomes the opportunity to do so. NACDL has an interest in ensuring that the composition of the subcommittees reflects a balance of expertise that will encourage the development of standards that are scientifically rigorous and also transparent in their limitations, as a means of producing accurate and reliable results that are interpreted in an unbiased and appropriately caveated manner: necessary predicates of due process and fair trials.

Below, NACDL proposes that each subcommittee include a balanced, multidisciplinary combination of experts reflecting the fact that each subcommittee will be tasked with developing a wide range of standards that require input from different fields of expertise. As part and parcel of its functional analysis of subcommittee composition, NACDL also addresses the related issues of the systematic review of scientific literature that must precede development of scientifically-supported standards, and the leadership of the subcommittees and their governing Scientific Area Committees (SACs).

NACDL draws in part on recommendations of another NRC committee that, after exhaustive research, set forth standards for the development of practice guidelines in another applied science context, paying particular attention to the interplay between systematic review and guideline development, and to aspects of guideline development group composition.¹ The foremost concerns of the committee were that practice guidelines be transparently based on the existing scientific evidence base (including its limitations) and that the group responsible for developing guidelines be assembled with attention to “balancing bias and including all relevant topical and methodological disciplines . . .” necessary to translate the evidence base into

¹ See *Clinical Practice Guidelines We Can Trust* (National Academies Press, 2011). While these standards were directed toward the formulation of guidelines for clinical practitioners, the principles that underlie them are universal. There is no reason why higher standards should apply to practitioners diagnosing and prescribing treatment for an illness compared with practitioners interpreting and reporting test results, which could be used to deprive an individual of his or her life and liberty.

trustworthy guidelines.² The NRC’s careful empirical analysis of what works and does not in standards developments is informative to a functional analysis of the OSAC subcommittees.³

I. Definitions

Forensic and Relevant Experts

For purposes of this functional analysis, NACDL borrows the Innocence Project’s (IP) definition of experts in its November 26, 2013 letter to NIST regarding its proposal for the structure of discipline-specific Guidance Groups. Hence, below we refer to the IP’s two broad categories of expert that would sit on the subcommittees: Forensic Science Experts and Relevant Experts.

Forensic Science Experts include Forensic Science Practitioners—which, as the IP noted, should not only include individuals actively doing casework in a forensic laboratory, but also independent consultants—and Forensic Scientists, which the IP defines as “a researcher or scientist from industry, a university setting, or scientific or governmental agency who conducts basic or applied research specific within forensic science disciplines or methods.”

A **Relevant Expert** is “a scientist, statistician, or engineer from a university setting or scientific, governmental agency or industry who conducts research within life, physical, cognitive, or computer science subjects relevant to forensic disciplines or methods and not previously focused on forensic science.” (emphasis added).

This dichotomy is particularly relevant to the discussion of balancing biases, below.

Systematic Review

A systematic review is a literature review focused on a research question that uses explicit, preplanned scientific methods to identify and assess the body of research evidence relevant to that question, and to synthesize high quality, methodologically-rigorous evidence.⁴ It uses an objective and transparent approach for research synthesis, with the aim of minimizing bias. Systematic reviews are used in a wide variety of fields, and are useful in determining in a methodical and impartial manner what is known and not known.

² *Id.* at 20.

³ “To be *trustworthy*, guidelines should

- be based on a systematic review of existing evidence;
- be developed by a knowledgeable, multidisciplinary panel of experts...;
- be based on an explicit and transparent process that minimizes distortions, biases, and conflicts of interest . . .” *Id.* at 4-5.

⁴ See, e.g., NRC, *Finding What Works in Health Care: Standards for Systematic Reviews* (National Academies Press 2011).

II. Systematic Review Preceding Standards Development Should Be Conducted By a Group Dominated By Relevant Experts and Separate From Standards Developers

Based on its own review of the available literature, the *Strengthening Forensic Science* committee found that there is a dearth of scientific evidence supporting forensic practice. In response to this criticism, NIST is working on developing measurement standards for the forensic disciplines, and compiling associated validation data; this undoubtedly will be a lengthy endeavor. In the meantime, however, it will fall upon the subcommittees to set forth standards that encapsulate and are consistent with the scientific evidence base that currently exists, including its limitations (*e.g.* for standards related to interpretation, report writing and examiner testimony). Thus, the development of a trustworthy body of standards must be preceded by a thorough and objective review of the existing scientific literature to identify its strengths and weaknesses.

The NRC has stressed the importance of a robust systematic review as a predicate to standards development.⁵ Like the standards developing body, the group conducting a systematic review must be carefully composed to minimize the influence of bias and to ensure the proper combination of expertise. It is particularly important that this group be dominated by methodologists who can assess the quality of research. It is equally important that this group not include people who approach the review with a preconceived notion about the quality of the scientific evidence base. This echoes the concern of the *Strengthening Forensic Science* committee that forensic reform efforts—such as standards development—must not be “encumbered by the assumptions [and] expectations” of the existing system.

For various reasons, this literature review and assessment should be carried out by a separate team than the standards-developing group.⁶ Different sets of expertise are required for the two different tasks: for example, whereas there is a role for both Forensic Science Experts and Relevant Experts in standards development (see discussion below), Relevant Experts, and particularly those with expertise that allow them to assess the quality of studies (*e.g.* experts in research methodology), must dominate a systematic review. Moreover, where the standards-developing team should be composed in a way that balances out biases (see below), systematic review teams seek to “exclude individuals whose professional or intellectual bias would diminish the credibility of the review.”⁷

⁵ See, *e.g.*, *Clinical Practice Guidelines We Can Trust*, at 2 (“Certain factors commonly undermine the quality and trustworthiness of [practice guidelines]. These include variable quality of individual scientific studies [and] limitations in systematic reviews (SRs) upon which [practice guidelines] are based.”)

⁶ *Clinical Practice Guidelines We Can Trust*, at 93-96.

⁷ *Finding What Works in Health Care: Standards for Systematic Reviews*, at 6 (Box S-2) (emphasis added). In the context of developing guidelines for clinical practitioners, the NIH believes that the two teams should be completely isolated to prevent practitioners on the standards-developing group from biasing the results of the literature review. See *Clinical Practice Guidelines We Can Trust*, at 93. The NRC found that there were drawbacks to a completely isolationist system, however, and instead recommended that the two teams periodically interact to exchange relevant

A review of various Scientific Working Groups' (SWGs) written responses to the 2009 NRC report underscores the wisdom of excluding Forensic Science Experts from participating in the literature review beyond a consulting role (*see fn. 7*): they universally concluded that the relevant scientific evidence base was strong and would permit them to individualize to an “extremely high” degree of certainty.⁸ Clearly it is inadvisable to use individuals or representatives of organizations that have already firmly and publicly made up their minds on the outcome of a review before it has begun.

NACDL strongly believes that the formulation of guidelines and standards for forensic practice must be informed by, and thus preceded by, a systematic review of the scientific evidence base. If NIST intends for the subcommittees to begin developing standards in advance of such a review, the composition of the subcommittees is all the more important, because these groups will for practical purposes conduct an informal literature review as part of their standard-developing responsibilities. While Relevant Experts are an important part of the subcommittees under any scenario (*see below*), if the subcommittees will be acting as informal literature reviewers, it is crucial that Relevant Experts make up a predominate portion of each subcommittee. This will not only ensure that each subcommittee has the expertise needed to assess the relevant literature (*e.g.* experts in research methodology), but also will make it more likely that the strengths and weaknesses of the scientific evidence base will be assessed in a neutral fashion.

knowledge pertinent to both their tasks. This would provide a way for Forensic Science Experts in the standards developing groups (*i.e.* the subcommittees) to point out any literature that they believe the literature reviewers failed to consider, and to explain any nuances of the scientific evidence that they believe the reviewers failed to grasp, while also allowing the Relevant Experts on the systematic review team to assist the standards developers in translating the scientific evidence into reliable guidelines and standards.

⁸ *See, e.g.*, SWGGUN, The Foundations of Firearm and Toolmark Identification (5/1/13), available at http://www.swggun.org/swg/index.php?option=com_content&view=article&id=66:the-foundations-of-firearm-and-toolmark-identification&catid=13:other&Itemid=43 (“[I]t is the conclusion of the Scientific Working Group for Firearms and Toolmarks (SWGGUN) that the discipline of Firearms/Toolmark Identification is scientific and reliable. Concomitantly, the identifications, individual associations or ‘matches’ effected in this discipline have firm scientific grounding with an extremely high degree of reliability based on the practical certainty of the validated theory. . . . The SWGGUN concludes that sufficient validation testing by competent examiners and collaborating scientists have been conducted to affirm the theory of firearm and toolmark identification over the past ninety years for it to be considered a legitimate science pursuant to the criteria set forth in the scientific method.”); SWGFAST, NAS Position Summary (*see supra*) (“SWGFAST maintains that a significant body of constructive scientific research has already been conducted that addresses some of the concerns expressed in the report. . . . The NAS states ‘With the exception of nuclear DNA analysis, however, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source.’ SWGFAST respectfully disagrees. History, practice, and research have shown that fingerprints can, with a very high degree of certainty, exclude incorrect sources and associate the correct individual to an unknown impression”); SWGSTAIN, Response to the NAS Report (“the foundation for these opinions is based upon well-established scientific principles. The scientific literature supporting these principles extends back more than one hundred years.”).

III. Subcommittee Composition Must Be Multidisciplinary, Including a Balance of Forensic Science Experts and Relevant Experts, to generate sound documentary standards, minimize bias, and promote collaboration

Whether or not it has the benefit of a separate systematic review to inform its decision making during the standards development process, each OSAC subcommittee will be responsible for assimilating the current scientific evidence base; the results of ongoing NIST-generated validation research; the best practices among forensic laboratories; and the essential elements of sound science into documentary standards covering a range of topics. Subcommittees that are composed of experts that are appropriately multidisciplinary in view of the topics to be covered, and balanced among Forensic Science Experts (from the public sector, the private sector and academia) and Relevant Experts will have a greater chance of successfully developing scientifically rigorous and (to the greatest extent possible) objective standards to forward to their respective SACs for review.⁹

A. Multidisciplinary subcommittees are needed to generate sound documentary standards for SAC review

The NRC found that “[e]mpirical evidence consistently demonstrates that group composition influences recommendations” and has recommended that, in the context of developing standards/guidelines for practitioners, these groups include a variety of experts beyond practitioners, particularly emphasizing the importance of methodological experts (*e.g.* statisticians, experts in research methodology).¹⁰ Bringing methodological experts and other scientists together with practitioners “increase[s] the likelihood that all relevant scientific evidence will be identified and critically assessed [and] increase[s] the likelihood that practical problems in guideline application will be identified and addressed”.¹¹ Examples from forensic science support this conclusion.

As the *Strengthening Forensic Science* committee noted, elements of sound science are absent from the best guidance available in most forensic disciplines despite the existence of SWGs. Comparing the work of the SWGs with the work of the NRC I and II committees on

⁹ It is NACDL’s understanding that one or more of the interagency working groups (IWGs) assembled by the Office of Science and Technology Policy has conducted an assessment of existing standards and practices in the forensic community. See <http://www.nist.gov/director/vcat/upload/10-WEISS-WH-Response-NEW-FINAL.pdf>. While the work of these groups and other standards development organizations (SDOs) may provide a good starting point for the subcommittees’ work, it is nonetheless essential that the subcommittees be staffed with an appropriate range of Relevant Experts (discussed further, *infra*) to enable them to evaluate such assessments and give input on next steps. Notably, it is unclear what if any role Relevant Experts played on the IWGs. Regardless, in the same way that the subcommittees must include a range of Relevant Experts to take full advantage of a systematic review, the subcommittees require Relevant Experts to assess the technical merit of IWGs’ (or other SDOs’) recommendations or other work product and determine whether and how they should be incorporated into documentary standards.

¹⁰ See *Clinical Practice Guidelines We Can Trust*, at 93 (Guideline 3.1)

¹¹ *Id.* at 85.

forensic DNA analysis is significant evidence that the prominence of Relevant Experts at the discipline-specific level improves the scientific rigor of the work product and ultimately the influence of the work product on the larger forensic community.

For example, SWGFAST, presumably selected to be a collection of thought leaders from the community of fingerprint practitioners, advocates an examination methodology that “does not guard against bias; is too broad to ensure repeatability and transparency; and does not guarantee that two analysts following it will obtain the same results.”¹² For years, SWGFAST guided practitioners to the conclusion that it was possible, on the basis of a side-by-side comparison of a known print and a latent print, to determine that the two “originated from the same source to the exclusion of all others.”¹³ As any statistician or expert in the scientific method (*e.g.* experts in experimental design, data collection and analysis) knows, it is not possible to individualize to the exclusion of all others, even with the best designed experiment (and certainly not with a single side-by-side comparison). It was only in response to criticism leveled by the statisticians and scientists responsible for the *Strengthening Forensic Science* report that SWGFAST (and other pattern-matching SWGs) removed the “exclusion of all others” language.

It is encouraging that SWGFAST was willing to accept that their long-time guidance was flawed and revise it; notably, it shows that forensic practitioners are willing to accept the criticisms of non-practitioner scientists (*contra* NIST’s concern that the subcommittees need to be dominated by practitioners for practitioners to accept their work product). However, it also showcases the limitations of the knowledge base of forensic practitioners, even the presumed leaders brought together in the SWGs. If the SWGs had included a significant number of Relevant Experts, these kinds of flawed interpretation standards would not have been promulgated and maintained.

The existing standards for report writing provide another example of the failure of entities dominated by forensic practitioners and forensic scientists to achieve rigorous documentary standards. As the *Strengthening Forensic Science* committee noted, the documentation and reporting scheme in many forensic disciplines—even those with more solid foundational bases—is characterized by “terse reports” that “[f]rom a scientific perspective, . . . is often inadequate, because it may not provide enough detail to permit a peer or other courtroom participant to understand and, if needed, question the sampling scheme, process(es) of analysis,

¹² *Strengthening Forensic Science*, at 142. This criticism applies equally to the other pattern matching disciplines and their associated SWGs. *See, e.g., Strengthening Forensic Science* at 155 (“A fundamental problem with toolmark and firearms analysis is the lack of a precisely defined process.”). The AFTE Theory of Identification, which continues to be advocated for by SWGGUN and “is the best guidance available for the field of toolmark identification, does not even consider, let alone address, questions regarding variability, reliability, repeatability, or the number of correlations needed to achieve a given degree of confidence.” *Id.*

¹³ *See* Definition of Individualization, SWGFAST glossary (archived 11/3/09), available at http://www.swgfast.org/documents/glossary/030909_Glossary-Consolidated_ver_1.pdf.

or interpretation.” *Strengthening Forensic Science* at 135 (critiquing practice in analysis of controlled substances). By including Relevant Experts such as research scientists, who routinely write up their results and conclusions, and are required to do so in a scientifically rigorous fashion, NIST will encourage the development of similar standards within the subcommittees for each forensic discipline.

Conversely, there are examples within forensic science of multidisciplinary committees creating more rigorous and ultimately more influential technical standards. The NRC I and NRC II committees were dominated by a range of Relevant Experts (including researchers specializing in areas relevant to DNA analysis (*e.g.* molecular geneticists, cell and molecular biologists, population geneticists); statisticians; and psychologists), and included a minority of Forensic Science Experts. “As a result, principles of statistics and population genetics that pertain to DNA evidence were clarified, the methods for conducting DNA analyses and declaring a match became less subjective, and quality assurance and quality control protocols were designed to improve laboratory performance.”¹⁴

The NRC has emphasized that multidisciplinary panels are all the more important where there are “limited evidentiary foundations for guideline development.”¹⁵ All of the pattern matching forensic disciplines clearly qualify, as do many others. However, even disciplines like DNA that are well-founded in scientific theory need the input of scientists outside the forensic science community in the continuing endeavor of developing documentary standards, which will require new research, technologies and methodologies to be addressed on an ongoing basis. As the *Strengthening Forensic Science* committee alluded to, there are currently several applications of forensic DNA analysis that are at higher risk of ambiguity and error in interpretation, such as analysis of increasingly limited amounts of DNA.¹⁶ The DNA subcommittees would benefit, for example, from the inclusion of researchers specializing in low level DNA analysis outside of the forensic context (*e.g.* ancient DNA analysis) to aid in developing methodology and interpretation standards related to forensic low level DNA analysis, as well as validation experts who would be able to explain what studies would be required to validate a low level DNA methodology.

Of course, the appropriate combination of experts depends upon the guideline/standard’s focus.¹⁷ Because each OSAC subcommittee will develop standards that address a wide range of topics, it is important that each subcommittee similarly include Relevant Experts from an appropriate range of disciplines, including but not limited to experts in experimental design (*e.g.* research scientists); experts in data gathering and analysis (*e.g.* statisticians)¹⁸; experts in

¹⁴ *Strengthening Forensic Science*, at 133.

¹⁵ *Clinical Practice Guidelines We Can Trust*, at 85.

¹⁶ *Strengthening Forensic Science*, at 132.

¹⁷ *Clinical Practice Guidelines We Can Trust*, at 86.

¹⁸ While a number of forensic disciplines, including the pattern-matching disciplines, do not yet utilize precise measurement standards that lend themselves to quantitative statistical analysis, statisticians are more generally

underlying scientific disciplines (*e.g.* materials scientists and engineers for firearms and toolmark analysis); validation experts; experts in minimizing bias and other quality control measures (*e.g.* psychologists and cognitive scientists)¹⁹; and experts in the application of forensic methodologies (*e.g.* practitioners).²⁰

While NACDL anticipates that the membership and leadership of the SACs, given their primary role as gatekeepers of which documentary guidelines and standards pass scientific muster, will be dominated by research scientists, statisticians, and other Relevant Experts, it is not enough to have the appropriate range of expertise among the reviewers. The standards developers themselves must possess a range of expertise or too few scientifically valid documentary guidelines and standards will reach the SACs.

B. Balanced multidisciplinary subcommittees are needed to manage biases

In its analysis of the standards-developing process, the NRC also emphasized the importance of composing standards-developing groups in such a way as to prevent one perspective—particularly that of individuals who are invested in a particular practice (who will be naturally inclined toward the perspective that the practice is scientifically rigorous, well-supported, and capable of producing reliable results and interpretations backed by high certainty)—to dominate.²¹ In addition to ensuring a range of expertise appropriate for the task of drafting all of the guidelines and standards for a forensic discipline, “guideline reliability may increase in a multidisciplinary group due to increased balancing of biases.”²²

The guidelines promulgated by the pattern-matching SWGs, which are composed of practitioners and other Forensic Science Experts, exemplify the NRC’s concerns. These SWGs

experts in data gathering and analysis, including qualitative data. This make them essential to each subcommittee’s work, for they are experts in translating a methodology’s limitations into appropriate conclusions.

¹⁹ Quality control is an integral part of any examination or testing methodology, as well as interpretation, making the input of quality control experts essential to the development of documentary standards. To the extent that *separate* quality control and assurance standards will be developed by the subcommittees, quality control experts become all the more important. Cognitive scientists and psychologists in particular are also important to developing standards related to terminology and reporting, as their expertise would allow them to, *e.g.*, assess how different suggested language would be processed and understood by a jury. While it is understood that the Quality Infrastructure Group will periodically interface with the subcommittees to provide guidance, it is important that there be some presence from quality experts on the subcommittees themselves.

²⁰ A scientist may possess expertise in more than one of these categories, *e.g.*, a researcher (expert in experimental design) who is an expert in a relevant field of science. Further, a forensic scientist might have experience or expertise in one or more of these areas, however they must be grouped with practitioners for purposes of balancing biases (see below, section IV.B). Composing the subcommittees with balance in mind dictates that the greater the role of practitioners, the lesser a role available for Forensic Scientists.

²¹ *Clinical Practice Guidelines We Can Trust*, at 84-86 ((in the context of clinical practitioners): “members of a clinical specialty are more likely to promote interventions in which their specialty plays a part”; “a single subspecialty group will arrive at contrasting conclusions compared to those of a multidisciplinary group”, and make recommendations that are less conservative).

²² *Id.* at 85 (emphasis added, parenthetical omitted).

advocate the language of “practical impossibility” to characterize the likelihood of a coincidental match.²³ This kind of language is not based upon a neutral and scientifically rigorous review of the strength of the available scientific evidence, nor is it informed by statisticians or other experts in data analysis—indeed, scientists do not speak in terms of “impossibility”—but instead this “guidance” adopts the strongest language permitted by courts in the wake of the *Strengthening Forensic Science* report. Standard setting should be based upon and appropriately limited by the available scientific evidence, not by how much practitioners can get away with in court.²⁴ This requires the significant input of Relevant Experts.

That there is an unconscious or subconscious bias among practitioners of any type (not just forensic) toward preservation and promotion of their practice is well-documented. Among Forensic Science experts, the *Strengthening Forensic Science* committee expressed an additional concern about a pro-law enforcement bias. “The entity that is established to govern the forensic science community cannot be principally beholden to law enforcement. The potential for conflicts of interest between the needs of law enforcement and the broader needs of forensic science are too great.”²⁵

Forensic Science Experts, both practitioners and researchers within the forensic sciences, have a role to play on the subcommittees. They may describe the circumstances under which forensic practitioners work, identify existing research and standards, and offer both criticisms and defenses of existing standards and practices. However, the subcommittees—the entities responsible for developing the standards that will govern forensic practice—should not only be dominated by Relevant Experts who have no investment in current forensic practice but should include a mix of public sector, private sector and academic Forensic Science Experts.

The Forensic Science Experts selected to the subcommittees should represent a balance of interest from within the discipline, and should not be dominated by individuals who primarily serve the law enforcement community, *e.g.*, practitioners and researchers from public forensic laboratories. Practitioners and forensic researchers who primarily serve law enforcement and those who do not should be equally represented. Included in those who do not serve law enforcement should be independent experts with experience reviewing the laboratory analyses of others.

²³ See, *e.g.*, SWGFAST, Standards for Examining Friction Ridge Impression and Resulting Conclusions (current), available at http://www.swgfast.org/documents/examinations-conclusions/130427_Examinations-Conclusions_2.0.pdf, at 5.3.2.2.

²⁴ See generally NACDL Comment on NIST Notice of Inquiry dated November 7, 2013 (“Protecting current laboratory practices and the admissibility of existing forensic methods must not factor into the decision-making processes of the Guidance Groups. Such non-scientific motives will not ‘improve the nation’s use of forensic science and promote best practices and standards.’”)

²⁵ *Strengthening Forensic Science*, at 17.

As a result, NIST should reconsider its definition of a forensic practitioner “as an individual actively doing or managing casework” and should reconsider its focus on a distribution between federal, state and local practitioners and instead focus on a balance between those who are or serve law enforcement and those who do not.²⁶ With relatively few exceptions individuals engaged in casework and working on the federal, state or local level will be those who are or who serve law enforcement, leaving little room for academic and other experts with expertise in reviewing the work of forensic practitioners. Along with the Relevant Experts, each group of Forensic Science Experts (public, private and academic) will bring a unique and valuable perspective to the process.

Best practices demand a careful blend of Relevant Experts and Forensic Science Experts from within and outside of law enforcement on the subcommittees if NIST is to manage biases in the process of developing documentary standards.

C. Balanced multidisciplinary committees promote necessary collaboration

In order for the subcommittees to be successful, they will also need to collaborate effectively. As the NRC has found, “heterogeneity in a decision-making group can lead to better performance *e.g.*, clarity and creativity in strategic decision making due to fewer assumptions about shared values than homogeneity.”²⁷ In other words, and placed in the forensic context, a heterogeneous group of Relevant Experts and Forensic Science Experts will be more effective and productive collaborators than a group composed primarily of Forensic Science Experts, because they will make fewer assumptions about what is known (*i.e.* scientifically supported) and not known during the standards drafting process.

In turn, the standards and guidelines that such a group develops will be more acceptable to the SACs and Forensic Science Standards Board from the outset and require fewer rounds of revisions before being promulgated; this will lead to faster implementation of scientifically-sound guidance for practitioners. Given the SACs’ duties to provide direction to the subcommittees and to ensure that the standards and guidelines developed by the subcommittees have technical merit (*i.e.* are scientifically supported), it is absolutely essential that the SACs be dominated by statisticians and other Relevant Experts. However, since the SACs can only approve or reject (with comments) the submitted guidelines and standards, if the subcommittees do not also include a significant number of Relevant Experts, the standards-developing process will be bogged down, and possibly will grind to a halt.²⁸

²⁶ *NIST Organization of Scientific Area Committees, Roles and Responsibilities*, available at <http://www.nist.gov/forensics/osacroles.cfm>.

²⁷ *Clinical Guidelines We Can Trust*, at 84-5.

²⁸ It is NACDL’s understanding that the subcommittees will have the ability to “interface” with the resource committees, however, the subcommittees will be the most effective if Relevant Experts are a part of every stage of the standard-developing process, not just the occasional consultant.

Moreover, isolating Forensic Science Experts on the subcommittees from Relevant Experts on the SACs and other committees in the upper tiers of the OSAC exacerbates the sense among practitioners and other Forensic Science Experts that Relevant Experts are “ivory tower” intellectuals that cannot relate to the day-to-day obstacles posed by the application of science in the forensic context. Because the subcommittee meetings will not be public, they provide the best possible forum for true collaboration between Relevant Experts and Forensic Science Experts from within and outside of law enforcement. For example, a subcommittee meeting provides an opportunity for Relevant Experts to suggest how current forensic practices might be modified to make them comport with the scientific method; for Forensic Science Experts in turn to identify potential practical problems in application of such modifications; for Relevant Experts to brainstorm fixes for perceived problems, or, where fixes are not possible, to explain what limitations this places on the conclusions that can be drawn.

In other words, a subcommittee composed of a balanced group of Forensic Science Experts and Relevant Experts allows for the kind of back-and-forth exchange that promotes creativity in problem solving and “increase[s] the likelihood that all relevant scientific evidence will be identified and critically assessed [and] increase[s] the likelihood that practical problems in guideline application will be identified and addressed.”²⁹ The standards developers are a team, and non-law enforcement Forensic Science Experts and researchers and statisticians from the broader scientific community should be seen as part of that team instead of as outsiders.

IV. Scientific Area Committees and Subcommittees Must Be Led By Relevant Experts

While the NRC called for, and best practices clearly dictate, the need for significant input from Relevant Experts in the creation of, and approval of, documentary standards for forensic disciplines, NACDL recognizes the daunting task of securing the involvement of a sufficient number of Relevant Experts to staff the OSAC. In the absence of equal numbers of Relevant Experts and Forensic Science Experts, NIST should give Relevant Experts leadership roles on both the subcommittees and the SACs to avoid dominance by practitioners and those who serve law enforcement. This approach would allow NIST to achieve the balance described above in section IV even if it cannot find an equal number of Relevant Experts and Forensic Science Experts for each subcommittee and each SAC.

Further, for those subcommittees that are particularly difficult to staff with Relevant Experts, NIST should be mindful of ensuring that the subcommittee is not also dominated by Forensic Science Experts aligned with law enforcement, and instead seek expanded involvement of and give leadership to independent Forensic Science Experts and academicians.

²⁹ *Clinical Practice Guidelines We Can Trust* at 85.

V. Conclusion

The NRC's charge to NIST was to reform the body of forensic science standards, with an emphasis on bringing a culture of science into forensic practice. NACDL's interest in this endeavor is aligned with the NRC's: one need look no further than the large and growing number of wrongful convictions premised on faulty forensics to see that there is an inextricable link between scientifically sound standards in forensic practice and fair trials.

As the application period for the OSAC draws to a close, NACDL appreciates the opportunity to provide analysis of how the organization can be composed in such a way as to result in optimal functioning, and hopes that this guidance will prove helpful to NIST as it begins the task of sorting through what will undoubtedly be a very large number of applicants with varied backgrounds and experience. In sum, NACDL advises that NIST heed the recommendations of NRC—both in its *Strengthening Forensic Science* report and its later blueprint for standards development in the applied science context—and include the significant input of Relevant Experts on each tier of the OSAC, and particularly a balance of Relevant Experts and Forensic Science Experts (and among Forensic Science experts, a balance between those who work for law enforcement and those who do not) at the subcommittee level. The composition of the subcommittees and the rest of the OSAC is the first and key step toward the development of scientifically rigorous guidance for the forensic science community.

Sincerely,

A handwritten signature in black ink, reading "Jerry J. Cox". The signature is written in a cursive style with a large, looping initial "J".

Jerry Cox
President