U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

HEARING CHARTER

Raising the Bar: Progress and Future Needs in Forensic Science

Tuesday, September 10, 2019
10:00 am – 12:00 p.m.
2318 Rayburn House Office Building

Purpose

On Tuesday, September 10, 2019, the Science, Space, and Technology Committee will hold a hearing to assess the progress in forensic science since the 2009 National Academy of Sciences report, *Strengthening Forensic Science in the United States: A Path Forward*, and to examine the role of the National Institute of Standards and Technology in the advancement of forensic science research and standards. In addition, the Committee will receive testimony on the *Forensic Science and Standards Act*, last introduced in the 114th Congress (H.R. 5795), including any recommendations for updates to the bill.

Witnesses

- **Ms. Susan Ballou,** Program Manager, Office of Special Programs, National Institute of Standards and Technology
- **Ms. Lynn Garcia,** General Counsel, Texas Forensic Science Commission
- **Ms. Vicki Zemp Behenna**, Executive Director, Oklahoma Innocence Project
- **Dr. Karen Kafadar,** Professor and Chair, Department of Statistics, University of Virginia, and President, American Statistical Association
- **Mr. Matthew Gamette**, Crime Lab Director, Idaho State Police Forensic Services

Overarching Questions

- Ten years after the release of the National Academy of Sciences report on the state of forensic science in the United States, what advances have been made in the science, standards, and practice of forensics in the criminal justice system? What work remains to be done?

- What is the role of the National Institute of Standards and Technology (NIST) in advancing forensic research, standards, and practice, in particular through the Organization of Scientific Area Committees for Forensic Science (OSAC) process? How effective has the OSAC been? What changes, if any, should be made to the organization, composition, or practices of the OSAC?

- In what ways could the *Forensic Science and Standards Act* help strengthen forensic science practices in the United States? Are there any recommendations for updates or improvements to the legislation?

Background

According to the Innocence Project[1], to date, 367 individuals convicted of murder, rape, and other violent crimes across 37 states have been exonerated as a result of DNA evidence. Those individuals served an average of 14 years in prison prior to their release. Twenty of them spent time on death row.[2] In one study of 108 cases involving 143 DNA exonerations (some of the cases had multiple defendants), researchers found that 121 of the actual perpetrators - later identified as such - went on commit 337 additional crimes, 61 percent of which were felonies or violent crimes, including rape and murder, while the innocent were wrongly imprisoned.[3]

Nearly half (44 percent) of the 367 total DNA exoneration cases involved the misapplication of forensic science, defined by the Innocence Project in their analysis as the use of an unreliable or invalid discipline, insufficiently validated method, misleading testimony, mistakes, and misconduct. Misapplication of the forensic discipline of serology accounted for 89 of these cases and the discipline of hair comparison for 75 of them.[4]

In 2012, the *Washington Post* published a series of investigative articles reporting on flawed forensic analyses that may have been responsible for wrongful convictions in thousands of criminal cases.[5] That series, by journalist Spencer Hsu, made him a finalist for the Pulitzer Prize that year. On July 17, 2013 Hsu reported that a federal review of old criminal cases undertaken just since their initial reporting had uncovered as many as 27 death penalty convictions in which FBI forensic experts may have presented scientifically invalid testimony as if it was scientific fact.[6] His April 15, 2015 article on this topic began with the following sentence:[7]

> *The Justice Department and FBI have formally acknowledged that nearly every examiner in an elite FBI forensic unit gave flawed testimony in almost all trials in which they offered evidence against criminal defendants over more than a two-decade period before 2000.*

[1] The Innocence Project and the National Registry of Exonerations define DNA exonerations and forensic science problems differently. They are currently working to reconcile the differences. Data here are provided by the IP.
[2] https://www.innocenceproject.org/all-cases/#
[3] https://onlinelibrary.wiley.com/doi/abs/10.1111/1745-9133.12463
[4] https://www.innocenceproject.org/overturning-wrongful-convictions-involving-flawed-forensics/
[5] https://www.washingtonpost.com/local/crime/convicted-defendants-left-uninformed-of-forensic-flaws-found-by-justice-dept/2012/04/16/gIQAWTcgMT_story.html
[6] https://www.washingtonpost.com/local/crime/us-reviewing-27-death-penalty-convictions-for-fbi-forensic-testimony-errors/2013/07/17/6c75a0a4-bd9b-11e2-89c9-3be8095fe767_story.html
[7] https://www.washingtonpost.com/local/crime/fbi-overstated-forensic-hair-matches-in-nearly-all-criminal-trials-for-decades/2015/04/18/39c8d8c6-e515-11e4-b510-962fcfabc310_story.html

In 2009, under the direction of Congress,[8] the National Research Council of the National Academy of Sciences (NAS) published a report entitled, *Strengthening Forensic Science in the United States: A Path Forward*.[9]

The NAS study committee found that forensic science, throughout the federal, state, and local levels, needed more scientific rigor and scientifically-based national standards. The committee further found that forensic science professionals had significantly overstated the reliability of "pattern matching" forensic disciplines, such as bite mark analysis, an example for which there was no scientific research to support its use. After discussing further weaknesses in the science and practice of forensic science nationwide, the committee provided 13 recommendations for improvements:

- Establish the National Institute of Forensic Science—an independent federal entity
- Establish standard terminology for reports and testimony about forensic science investigations
- Fund research to address the issues of accuracy, reliability, and validity of forensic science investigations
- Separate public forensic laboratories from administration and control of law enforcement agencies or prosecutors' offices
- Fund research on sources of human bias in forensic science
- Develop tools to improve the application of metrology, validation, proficiency testing, and the exchange of information
- Require laboratory accreditation and individual certification of forensic science professionals
- Establish routine quality assurance and quality control procedures
- Create a national code of ethics for forensic science professionals
- Develop programs, scholarships and fellowships to attract students to pursue graduate studies in fields critical to forensic science practice
- Establish regional, accredited, modernized medical examiner offices with forensic pathologists
- Establish standards for interoperability of Automated Fingerprint Identification Systems
- Prepare forensic science professionals for their potential roles in managing and analyzing evidence from events that affect homeland security

[8] Science, State, Justice, Commerce, and Related Agencies Appropriations Act of 2006
[9] Report available at: https://www.nap.edu/catalog/12589/strengthening-forensic-science-in-the-united-states-a-path-forward

The NAS report spurred a series of actions by the Obama Administration. In 2013, NIST and the Department of Justice established the National Commission on Forensic Science (NCFS), a federal advisory committee composed of more than 40 lawyers, judges, statisticians, research scientists, victim advocates, law enforcement agencies, forensic lab directors, and forensic practitioners. The NCFS was charged with making recommendations to enhance the practice and improve the reliability of forensic science. The NCFS reached a consensus on more than 40 working documents on forensic topics as varied as professional accreditation, trial testimony, human factors, and basic research.[10] The NCFS was disbanded in 2017 on the order of then-Attorney General Jeff Sessions.

Organization of Scientific Areas Committees for Forensic Science

In 2014, NIST established the Organization of Scientific Area Committees for Forensic Science (OSAC). While NIST has a handful of employees dedicated to OSAC administration, the OSAC committees are primarily run by the 500 plus volunteer practitioners, statisticians, scientists, researchers, judges and lawyers. The OSAC is funded at about $3 million per year. An additional $1 million is provided to support assessment of the technical merit of existing foundational science for different forensic disciplines.

Five Scientific Area Committees (SAC) cover broadly defined forensic science topic areas and oversee 25 discipline-specific subcommittees. The subcommittees work to identify existing high-quality standards and to facilitate the development of new standards. The standards developed in the subcommittees are then forwarded to the respective Scientific Area Committee(s) for approval. After SAC approval, the standards are then forwarded to the Forensic Science Standards Board (FSSB) for final approval. (See Figure 1 on the next page.)

The FSSB also administers overall operation of the organization, approves standards for inclusion on the OSAC Registry, approves membership nominations, resolves disputes and appeals, and engages in international efforts related to forensic science standards**.** NIST is currently soliciting feedback from stakeholders and OSAC participants for implementing a possible update to the OSAC structure—"OSAC 2.0."

Research at NIST

NIST carries out measurement research in support of forensic science and standards, both within its own laboratories and through a center of excellence at Iowa State University, the Center for Statistics and Applications in Forensic Evidence (CSAFE). The total budget for this research is about $8.5 million. There are six focus areas for the intramural research: DNA, toxicology, trace evidence, tool marks, statistical methods, and digital evidence. NIST also has a number of forensics projects relevant to the opioid crisis, specifically developing tools to help identify the composition of seized drugs. CSAFE was established in 2015 under a 5-year grant at $4 million per year and focuses on pattern matching disciplines.

[10] https://www.justice.gov/archives/ncfs/work-products-adopted-commission

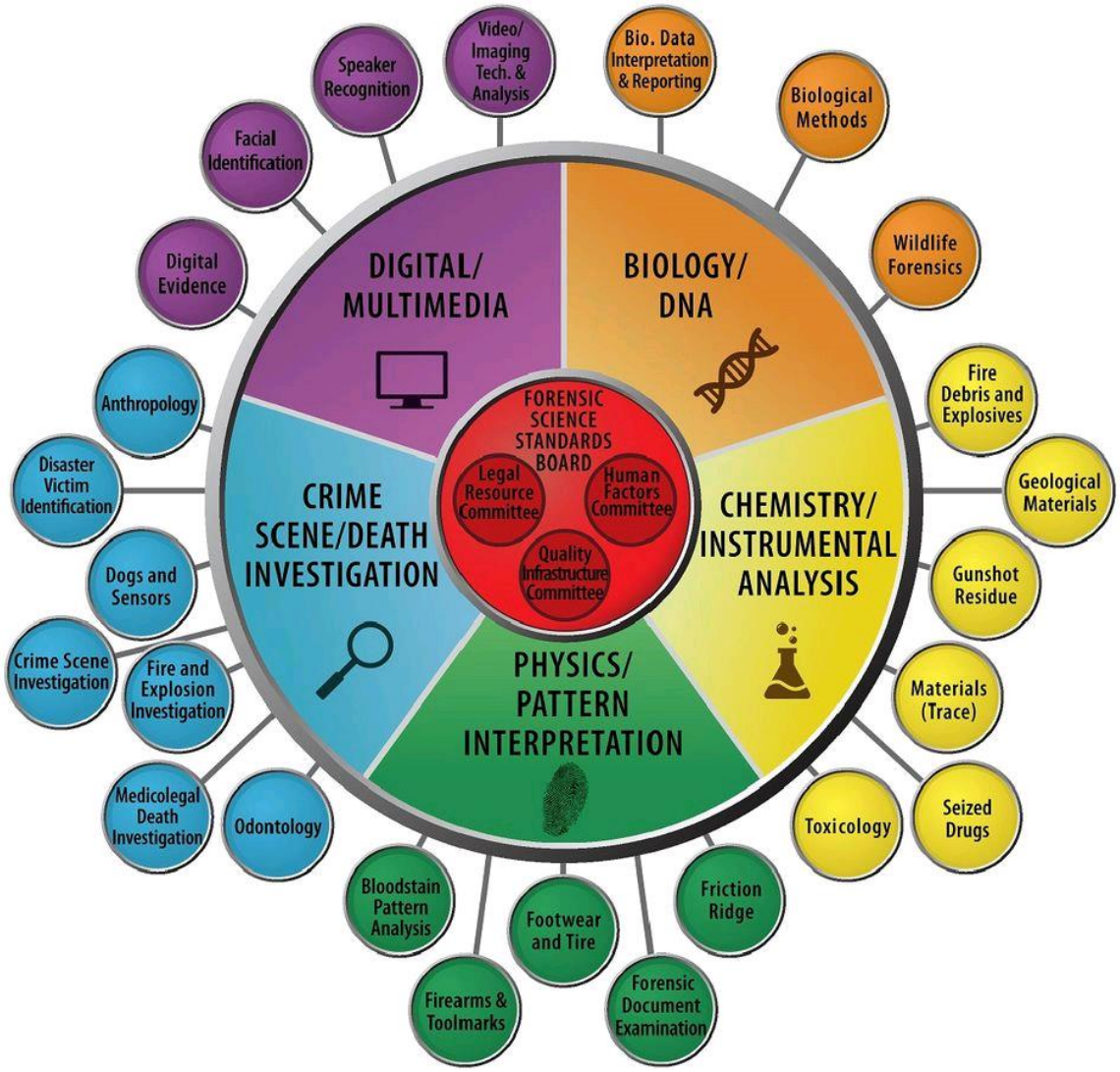

Figure 1 OSAC Structure

Research at the National Science Foundation (NSF)

The National Science Foundation supports foundational research in forensics across several disciplines, including digital forensics and human factors, e.g. understanding expert testimony and eyewitness identification. In 2017, NSF awarded a 5-year Industry University Cooperative Research Center grant to Florida International University and a number of partner institutions to establish the Center for Advanced Research in Forensic Science (CARFS).

National Institute of Justice (NIJ) at the Department of Justice (DOJ)

While not a focus of this hearing, the NIJ also supports grants for improved forensic science practice, including some research. The Coverdell Forensic Science Improvement Grants, funded at about $30 million per year, awards grants to states and units of local government to help improve the quality and timeliness of forensic science and medical examiner/coroner services.[11] NIJ has a separate program to provide support for DNA, in large part to increase the capacity of laboratories to process DNA and reduce the backlog. NIJ also supports research and evaluation grants for forensic laboratories to improve their practices.[12] The most recent solicitation in April 2019 was supported at a total of $2.5 million, with individual awards up to $500,000 over 5 years.

Forensic Science and Standards Act

Chairwoman Johnson, in previous Congresses, has introduced the *Forensic Science and Standards Act*. The bill, each time, was referred to the Science Committee and the Judiciary Committee but no further action was taken. The latest version was H.R. 5795, introduced during the 114th Congress.

The Act seeks to establish scientific standards and protocols across forensics disciplines using a variety of measures:

- Establishes a national initiative in forensic science to coordinate federal research in forensic science and develop a unified federal forensic science research strategy
- Authorizes forensic science research at NSF and NIST, including the establishment of research centers at both agencies
- Encourages the use of prizes and challenges to advance forensic science
- Authorizes a follow-on report by the NAS to assess progress under the initiative
- Establishes NIST-managed committees focused on forensic science standards, providing broad authorization for the OSAC process
- Establishes a joint commission run by NIST and the Department of Justice to review forensics standards and promote wide adoption of acceptable standards, providing broad authorization for the now defunct National Commission on Forensic Science

The hearing will examine how an updated version of the *Forensic Science and Standards Act* could be helpful in advancing forensic science research and the development and adoption of effective forensic standards.

[11] https://nij.ojp.gov/coverdell-national-forensic-science-improvement-grants-program
[12] https://nij.ojp.gov/research-and-evaluation-publicly-funded-forensic-laboratories