FORENSIC SCIENCE

Forensic science is critical to an effective justice system, which in turn is a central pillar of a civil society. It is an interdisciplinary field that includes chemistry as a prime, integral component. The American Chemical Society (ACS) therefore offers a unique and wide-ranging ability to influence and contribute to the advancement of forensic science.

Physical evidence presented in courts is frequently analyzed using forensic science techniques. The credibility of the legal system critically depends on forensic tests that are consistent and scientifically valid, witnesses who are certified and recognized as forensic experts, and laboratories that are accredited by an appropriate governing agency.

Modern forensic science faces enormous challenges. The National Academies report, Strengthening Forensic Science in the United States: A Path Forward, enumerates the problems of the forensic science community in great detail. The report notes that due to its history, its interdisciplinary and applied nature, and its close ties to law enforcement and the legal system, forensic science has not developed a rigorous culture. Therefore, analytical method training and validation that are hallmarks of other scientific fields are often absent in forensic science.

Forensic science also plays an important role in U.S. national security. Investigating terrorist threats from chemical and biological agents, such as the 2001 anthrax attacks, requires novel methods of evidence collection and innovative forensic techniques. Nuclear Forensics: A Capability at Risk, a report released by the National Academies, identifies four areas of concern for nuclear forensics, which are also relevant for other types of forensic science: (1) organizational structure, (2) sustainability of existing capabilities, (3) the need for a skilled workforce and adequate infrastructure, and (4) improved procedures and modern tools.

ACS applauds the recent formation of the National Commission on Forensic Science at the National Institute of Standards and Technology and the Department of Justice and looks forward to working with this Commission as it strives to strengthen and enhance forensic science.

ACS asks policymakers to support forensic science reform through the following general and specific recommendations:

**Strengthen scientific rigor within the forensics culture and expand and integrate forensic science research with the larger scientific community**

- Consult scientists, law enforcement, and legal professionals to identify forensic science research priorities.
- Establish federal funding opportunities to support forensic science research and graduate education by both the existing scientific community and newly-trained forensic scientists.
- Support collaboration and communication between scientists performing basic and applied research relevant to forensic science and forensic science practitioners.
• Establish a structure for forensic case reports that is rooted in the scientific method.
• Ensure the independence of the forensic science community from law enforcement.
• Optimize the federal government's support of forensic science research by coordinating efforts across agencies.
• Promote forums for communication of advances in forensic science at technical research conferences and in peer-reviewed journals.

Quantitatively assess and improve the accuracy of forensic analytical methods
• Support work to quantify the reliability and accuracy of existing methods based on scientifically rigorous criteria.
• Research and quantify sources and effects of human error and automate forensic tests where appropriate.
• Develop and certify analytical techniques and standards appropriate for forensic applications.

Monitor and ensure the quality of forensic science education and practice
• Use congressional authority over available grant funding to promote forensic science research.
• Mandate rigorous accreditation of laboratories, certification of scientists and other forensic science practitioners, and establish ethical standards.
• Develop a new quality control framework to strengthen and supplement existing requirements for accreditation, regular inspections, and enforcement procedures.
• Provide education for law practitioners, scholars, and judges in forensic science methods and practice.
• Provide training for forensic scientists in law enforcement, evidence collection, and the law as these all pertain to the practice of forensic science.
• Develop outreach programs for the public that highlight the capabilities, limitations, and potential of forensic science.

Address challenges for using forensic science when responding to homeland security crises
• Train forensic scientists for potential roles in an emergency.
• Establish rules for sharing security-sensitive findings with the wider research community.