

## FORENSIC SCIENCE

Forensic science is critical to an effective justice system, which in turn is a pillar of a civil society. It is an interdisciplinary field that includes chemistry as a foundational and integral component. Physical evidence presented in courts is frequently analyzed using forensic science techniques that are often grounded in chemical principles and methods. The credibility of the legal system critically depends on forensic tests that are consistent, accurate, and scientifically valid. Consequently, it is of significant importance to the American Chemical Society (ACS) that best practices from chemistry are part of how forensic science is carried out.

Modern forensic science faces enormous challenges. The 2009 National Academies report, *Strengthening Forensic Science in the United States: A Path Forward*, enumerated the problems of the forensic science community in detail. The report noted 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 culture that reflects important aspects of how sciences such as chemistry are conducted – the centrality of evidence, the analysis and interpretation of verifiable data, efforts to identify and avoid bias, and clear connection to and building on peer reviewed research. Therefore, the necessary work to establish validity and reliability in analytical methods that are hallmarks of other scientific fields is often weak or absent in forensic science.

Forensic science also plays a critically important role in other areas such as the investigation of domestic and international incidents, U.S. national security, and ensuring public health and safety. 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 in 2010 by the National Academies, identified areas of concern for nuclear forensics that overlap with concerns raised about forensic science in general. Strengthening the scientific foundations of forensic science will benefit these areas of public concern as well.

ACS applauded the formation of the National Commission on Forensic Science (NCFS) and the Organization of Scientific Area Committees for Forensic Science (OSAC) involving the National Institute of Standards and Technology and the Department of Justice, and worked with this Commission and OSAC as they made strides to strengthen and enhance forensic science. The functions performed by these agencies were an important step in forensic science reform and, therefore, these agencies should be reinstated as part of the Executive Branch in future administrations. ACS also applauded the policy recommendation by NCFS and subsequent action by the Department of Justice (DoJ) to require all DoJ forensic labs to acquire and maintain accreditation.

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

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

- Consult scientists, law enforcement, and legal professionals to identify and post current forensic science research priorities.
- Expand federal funding opportunities to support forensic science research and graduate education by both senior and junior members of the scientific community.
- Strengthen and expand the federal government's support of forensic science research by coordinating efforts across agencies such as the National Institute of Justice, NIST, NIH, NSF, DOD, DHS, and DOE.

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The American Chemical Society (ACS) Board of Directors Committee on Public Affairs and Public Relations adopted this statement on behalf of the Society at the recommendation of the Committee on Science. ACS is a non-profit scientific and educational organization, chartered by Congress, with more than 158,000 chemical scientists and engineers as members. The world's largest scientific society, ACS advances the chemical enterprise, increases public awareness of chemistry, and brings its expertise to state and national matters.

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- Support collaboration and communication between scientists performing basic and applied research relevant to forensic science and forensic science practitioners.
- Ensure the independence of the forensic science community from law enforcement.
- Support improvements in the quality of the forums for communication of advances in forensic science, including rigorous peer review in all journals.

#### **Validate and improve the accuracy of forensic analytical methods**

- Develop quantitative criteria and standardized procedures as part of validated analytical techniques in forensic science.
- Research and quantify sources and effects of human error and automate forensic tests where appropriate.

#### **Monitor and ensure the quality of forensic science education and practice**

- Promote basic and applied forensic science research, as well as translation and deployment of new techniques into forensic laboratories.
- Continue to work towards rigorous accreditation of laboratories at all levels (federal, state, local, tribal), certification of scientists and other forensic science practitioners, and establishment and promotion of ethical standards for forensic scientists.
- Provide education for law practitioners, scholars, and judges in forensic science methods and practice.
- Develop outreach programs for the public that highlight the capabilities, limitations, and potential of forensic science.