



Criminalistics Section - 2016

B94 The Future of Forensic Instrumental Methods of Analysis

Glen P. Jackson, PhD*, West Virginia University, Dept of Forensic and Investigative Science, 208 Oglebay Hall, Morgantown, WV 26506-6121

After attending this presentation, attendees will understand the current state-of-the art in instrumental methods of analysis and where the trends are likely to lead. Attendees will also gain an appreciation for factors that are likely to affect future trends.

This presentation will impact the forensic science community by providing practitioners with examples of technologies that have the ability to impact the way forensic analyses are performed. The possibility of performing on-site confirmatory tests has the ability to revolutionize the way forensic evidence is used and could result in criminal investigations being quicker and more efficient.

Instrumental methods of chemical analysis provide objective and largely irrefutable circumstantial evidence in the support of criminal prosecutions. Chemical measurements can also be archived for validation or cross-examination by third-party expert witnesses and are widely accepted as among the most reliable of forensic techniques; they received no criticism in the highly critical 2009 National Academy of Sciences (NAS) Report, *Strengthening Forensic Science in the United States — A Path Forward*. Several recent advancements in different technologies have resulted in a shift toward on-site and *in situ* chemical measurements, and the forensic community will have some important decisions to make regarding its future in this uncertain area.

This presentation will cover a variety of developments in instrumental methods of analysis that have the potential to impact the way forensic analyses are performed and will engage in discussion on the likely effects of their adoption into different levels of casework. For example, technologies can be incorporated at the crime scene or in the presence of suspects/victims, in remote vehicles, at booking, or in the crime laboratories. The point of analysis will influence the expertise of the instrument operator, the potential for contamination or mishandling, the relevance to evidence collection, and the relevance to the prosecutorial process. More specifically, the ability to identify substances in real time *in situ* can assist investigators with evidence collection and the prioritization of evidence. Similarly, the ability to identify suspected drugs before or during booking can assist with the accurate investigation of alleged crimes.

This presentation will also discuss some of the major concerns about the adoption of new technologies, including: (1) the expertise and ability of police officers to conduct chemical measurements; (2) the uncertainty or insecurity of laboratory-based drug analysts; and, (3) the ability of on-site measurements to withstand scrutiny in court.

Finally, this presentation will address some factors that are likely to influence the adoption of instrumental methods of analysis. These factors include the requirement for some brave game changers to set precedents with the adoption of new technologies and the requirement for a less conservative system or branch of practitioners who can adopt or propel such cutting-edge developments. The discussion of pros and cons of future technologies should not be construed as an endorsement or warning for change, but as an initiation for discussion as to how to prepare for this domain in the future of criminalistics.

Instrumentation, Analysis, *In Situ*