

## Metrology in the courtroom

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The scientific validity and defensibility of quantitative measurement results reported by crime laboratories and forensic testing facilities is under increasing scrutiny in light of the expanding media coverage of incidents of science misconduct in forensic analysis. The importance of analytical measurement assurance quality systems is fundamental to the accreditation of crime laboratories and other independent forensic testing laboratories. With a sound metrological cornerstone, forensic measurement data will have scientific integrity and meaningful interpretational value, and the measurements results will be able to withstand intense scrutiny in the courtroom. This presentation provides an introductory overview of metrology and its relevance to the many facets of the overall analytical measurement process. The key metrological concepts of calibration, traceability and measurement uncertainty will be described as they apply to the determination and reporting of breath and blood alcohol content and other applications of quantitative forensic analysis. The vital interaction between analytical method validation and instrument qualification will be discussed. Selected courtroom outcomes in which metrology played a key role in the decision will be highlighted.

### Biography

Jerry D. Messman holds a Ph.D. degree in Analytical Chemistry from the University of Maryland (College Park, MD USA). He has been involved in various spectrometric aspects of analytical chemistry and metrology throughout his entire professional career beginning 35 years ago with the National Bureau of Standards (NBS). During his tenure at the National Institute of Standards and Technology (NIST), he was responsible for rejuvenation of the high-accuracy spectrophotometric standards program in the Chemical Sciences and Technology Laboratory. For the past 20 years, he has served as Managing Director and Senior Scientist of Stranaska Scientific LLC, an analytical research and development company dedicated to the scientific and educational advancement of analytical metrology worldwide. He is a member of the Chemistry and the Law Division of the American Chemical Society as well as a member of CITAC, an acronym for the Cooperation on International Traceability in Analytical Chemistry.

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