I36 Enhancing Communication Bolsters Quality and Ethics

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After attending this presentation, attendees will better understand one another's technical terminology and thereby be able to more effectively evaluate the conclusions from forensic work as it continues to come under public scrutiny from origins that have significantly variable validity.

This presentation will impact the forensic science community by enabling attendees to respond to fundamental public criticisms of some of their methods and techniques. Attendees will leave better equipped to assess critical ethical issues arising from recent powerful technical advances, which have the potential to affect the standing of both individuals and organizations within the forensic sciences.

Across their disciplines forensic scientists continue to experience political and professional scrutiny of the validity and reliability of their work. A closely related issue of current importance is an ongoing need for due vigilance regarding the appearance and the reality of professional ethics in the practices of forensic scientists. Recent and current responses on the part of the federal executive branch, as well as the general public to the National Academy of Sciences Report of 2009, seem to indicate that this trend of increasing scrutiny of expert forensic scientists is likely to accelerate. The purpose of this presentation is to promote the value of expanding and strengthening a shared language that will facilitate communication both among forensic scientists and between them and concerned lay onlookers. Enhancing clarity promotes understanding, which in turn serves justice.

Genetics is among the areas in most urgent need of sharing its vocabulary. It is rapidly advancing in its own right as well as in its applications to several of the forensic disciplines. In particular, a great deal is being discovered about both natural and artificial applications of epigenetics, the study of the regulation of genes by means of chemical changes. Diagnostic applications are coming to light, such as an apparent association of addiction with alterations in genetic regulation. There are also apparent correlates with exposure to adverse environmental influences. The same appears to hold for the quality of one's relationships. Another concept valuable for forensic experts to understand is that of Single Nucleotide Polymorphisms (SNPs). These are involved in DNA phenotyping, which can be used to make comparisons among populations instead of individuals. In addition, recent technical advances are greatly simplifying the alteration or "editing" of the very genes themselves *in vivo*. Yet another rapidly emerging development is the genetic study of microbiomes, referring to all the unique microorganisms that populate various bodily surfaces. The techniques being developed have the potential to rule a suspected connection in or out.

The topics discussed here are at relatively early stages of development. As such, they have more to do with investigating crimes than with definitively solving them; with excluding suspects rather than identifying them. They are likely as they progress and mature to give rise to ethics issues and challenges. Finally, the diversity initiative now underway within the American Academy of Forensic Sciences (AAFS) has the potential to engage the means for promoting an enhanced level and quantity of collaboration.

Epigenetics, SNPs, Microbiome