



Criminalistics Section - 2016

B89 Hair Analysis: Learning From the Past and Moving Toward the Future

Sandra Koch, MS, Penn State University, Dept of Anthropology, Carpenter Bldg, Rm 403C, University Park, PA 16802*

After attending this presentation, attendees will better understand how the existing nomenclature used in microscopical hair analysis originated, the pressing need to revise how hairs are characterized for ancestry and root growth stage, and the significance of differences in microscopic characteristics present within hair structures.

This presentation will impact the forensic science community by emphasizing the need to standardize terminology and to promote an approach for microscopical hair examinations that is inclusive to the various disciplines studying hair today.

Microscopical and morphological analysis of hair occurred originally in anthropological studies of population groups in which racial classification was a primary concern. The methods and terminology used were then imported into medicolegal contexts and cosmetological research. As each field developed their unique analyses of hair, communication between fields declined. One of the unfortunate side effects was the continued use of outdated racial terminology in forensic hair examinations long after the terminology had been abandoned in anthropology. The more acceptable terminology currently being used outside of forensic hair examinations will be described with the goal of changing racial descriptors to ancestry-based groupings.

Correctly differentiating the growth stages of hair roots based on morphological characteristics and the presence of associated follicular tissue is important in forensic hair examination for determining whether a hair may be suitable for nuclear DNA testing or mitochondrial DNA. Unfortunately, different scientists look at an evidential hair and often differ in their classifications of root growth stage. This happens irrespective of experience so discussion will include the different growth stages, how they can be reliably differentiated, what examinations are most appropriate for these determinations, and the effects of conflicting growth stage categorization on forensic research.

Recent reviews of past hair examinations have focused on how laboratory results have been reported and used as the focus for testimony. Such reviews often have a positive outcome because they lead to improvements in how the discipline presents its findings and limitations. The various resources available through the Scientific Working Group for Materials Analysis (SWGMA) and the Organization of Scientific Area Committees (OSAC) Materials (Trace) Subcommittee will be discussed, as well as certification, training, and research needs.

The field of hair analysis is in a state of transition, but with a careful review of the language used and what it means to others, a transparent evaluation of the evidence and the scientific basis for the results can be presented. With an interdisciplinary outlook, the field can more easily embrace change both in expression of results but also in application of new technology. By moving away from isolationist practices and research, hair analysis will continue to improve and remain relevant in forensic laboratories and research for years to come.

Hair, Telogen Roots, Ancestry