National Association of Criminal Defense Lawyers
Commentary on ASTM WK72597:
New Standard Guide for the Microscopical Examination of Human Hair
May 27, 2020

The National Association of Criminal Defense Lawyers (NACDL) submits the following comments on ASTM WK72597: New Standard Guide for the Microscopical Examination of Human Hair. NACDL submits that the issues identified below must be remedied before the standard is adopted and submits a "negative" ballot.

NACDL is the largest organization in the United States advancing the mission of the criminal defense bar to ensure justice and due process for persons accused of crime or wrongdoing. A professional bar association founded in 1958, NACDL's direct members —and 95 state, provincial, and local affiliate organizations —include private criminal defense lawyers, public defenders, military defense counsel, law professors, and judges committed to preserving fairness and promoting a rational and humane criminal justice system. NACDL has a strong interest in ensuring the accuracy and reliability of all evidence that may be introduced to support a criminal prosecution.

NACDL has played a vital role in several significant historic reviews of flawed forensic science evidence. In 2007, NACDL partnered with the Innocence Project and the FBI to review comparative bullet lead analysis cases, following the FBI's admission that its agents potentially gave flawed or misleading testimony in thousands of such cases. NACDL worked with the Department of Justice (DOJ) Office of Enforcement Operations to correct the serious injustice caused by the failure to notify thousands of defendants whose cases were affected by the findings of wrongdoing in the 1996 Office of the Inspector General Report and FBI Task Force investigation. In addition, NACDL and the Innocence Project partnered with the FBI and the DOJ in their review of criminal cases in which the FBI conducted microscopic hair analysis in order to identify cases in which FBI hair examiners made scientifically invalid statements in testimony or lab reports. While the review is ongoing, the results thus far have conclusively documented the extraordinary frequency of exaggerated testimony.

NACDL Comments on Standard Guide for the Microscopical Examination of Human Hair
NACDL's comments are beneath the selected sections.

3.18.1 *Discussion- A conclusion reached in a comparative hair examination when meaningful differences are noted in the macroscopic or microscopic characteristics between the questioned and known hairs; however, the differences are not great enough for an absolute exclusion of a person as a possible source. This could be due to the natural variation that occurs in hairs as a biological specimen, the effect that time or environment can have*

upon a hair, or the reference sample may not capture the complete variation of the individual's hair.

This *Discussion* does not provide information necessary to the definition of "exclusion with limitations" and is confusing. The term "meaningful difference" is controversial and undefined and thus adds nothing to the definition of this type of exclusion.

3.19 *Exclusionary difference – a difference in a feature or property between compared items that is substantial enough to conclude that they did not originate from the same source.*
3.19.1 *Note 1: An exclusionary difference is statistically supported when an appropriate statistical analysis shows a result outside the range of what usually occurs when the items originate from the same source.*

Section 3.19 is unnecessary and should be eliminated. "Substantial enough" is undefined and Note 1 suggests there is a statistic or statistical analysis associated with microscopic hair comparison when there is not. The standard guide document itself provides appropriate information regarding what constitutes a difference that would call for an exclusion.

9.7.3 *A second, qualified hair examiner shall independently verify every microscopical hair association of probative value. When possible, this verification is performed with limited case information or as a blind verification (13, 18). Inconclusive and exclusionary conclusions can also be verified. If there is a difference of opinion, defer to laboratory policy for resolution. It is recommended that actions taken to resolve conflicts be documented and maintained in the case record.*

This should be modified to state verification shall be performed on all hair comparisons whether the results are an association, an exclusion or inconclusive. All differences of opinion and the actions taken to resolve conflicts shall be documented in the case record.

10.1.5 *Microscopy and DNA analysis are often complementary. Mitochondrial DNA alone does not provide individualization. There are also cases where nuclear or mitochondrial DNA cannot be obtained from hairs or yield a limited profile. In these cases, the additional information gained through microscopical comparison provides sufficient information to potentially include or exclude an individual as a possible source of the hair. A combination of comparison microscopy and mtDNA often provides a stronger conclusion as to the potential source of the hair than the use of either technique alone (11).*

NACDL recommends that this section be removed because although microscopic hair comparison is of use to determine whether, and what type of DNA analysis is appropriate, using

hair comparison to provide probabilities to a particular inclusion of someone as a source of a questioned hair cannot be scientifically supported.

13.2.2 *A hair can be further classified by its characteristics to an ancestral group and to its somatic origin.*

This should be clarified to clearly state the following limitation as stated by the FBI Laboratory: "The scientific analysis of hair evidence permits an examiner to offer an opinion that a questioned hair possesses certain traits that are associated with a particular racial group. However, since a statistical probability cannot be determined for classification of hair into a particular racial group, it would be error for an examiner to testify that he can determine that the questioned hairs were from an individual of a particular racial group. Thus, an examiner cannot testify with any statement of probability whether the hair is from a particular racial group, but can testify that a hair exhibits traits associated with a particular racial group."

13.3 *The following conclusions can be reached as a result of a microscopical hair comparison between a questioned hair and a submitted known sample: associative, inconclusive, and exclusionary (17, 24).*

It should be stated that as a result of microscopic hair comparison, a conclusion cannot be reached that associates a hair to a particular person. An "associative" conclusion should be explained and reported as an inclusion that could indicate, at the broad class level, that a contributor of a known sample could be included in a pool of people of unknown size, as a possible source of the questioned hair. Thus, there should not be a conclusion reported that a hair is "associated" with a person based on the results of microscopic hair comparison. This type of conclusion would have to be followed by mtDNA testing to indicate an association with a person.

13.5 *An examiner should not provide a conclusion that includes a statistic or numerical degree of probability.*

This section should be expanded to include an additional statement that an examiner should not in any way give probabilities, an opinion as to the likelihood or rareness of the association, or the size of the class or pool of individuals who could be included as a possible source of the questioned hair. Statements of likelihood such as rare, unlikely, unusual, etc., that are expressed in terms other than numbers or literal statistical statements are also unsupported and not scientifically valid conclusions.
Additionally, the section should add a statement that an examiner should not cite the number of cases or hair analyses conducted and the number of samples from different individuals that could

not be distinguished from one another as a predictive value or likelihood that a questioned hair came from a specific individual. This type of conclusion is not scientifically supported.