TEXAS FORENSIC
SCIENCE COMMISSION
Justice Through Science
1700 North Congress Ave., Suite 445
Austin, Texas 78701

September 29, 2015

Mr. John Neuner
Executive Director
ASCLD/LAB
139 J Technology Drive
Garner, NC 27529

RE: ASCLD/LAB July 31, 2015 Announcement re: DNA Mixture Interpretation

Dear Mr. Neuner:

The Texas Forensic Science Commission ("Commission") submits this letter on behalf of accredited crime laboratories in Texas requesting clarification regarding the July 31, 2015 announcement from ASCLD/LAB copied below. In the announcement, ASCLD/LAB requires accredited forensic laboratories to test DNA mixture interpretation procedures "on mixture profiles from known contributors representing the range of mixture types (*e.g.*, different numbers of contributors, mixture proportions, and template quantities) to which the procedure will be applied in casework." Following is the relevant language:

The Interpretation of a DNA Profile Containing a Mixture of Two or More Individuals

Must be implemented in ASCLD/LAB accredited and applicant laboratories by **December 1, 2015** (120 calendar days from the release date of this communication – adjusted slightly to account for the Thanksgiving holiday in the United States).[1]

Most Applicable Accreditation Requirement: 5.4.5.2 from ISO/IEC 17025:2005

Procedures for DNA profile interpretation must be based on validation data. The interpretation of a DNA profile containing a mixture of two or more individuals must be guided by a procedure that includes specific defined steps that will enable different analysts in the same laboratory to reach the same conclusion; and a competent person from outside the laboratory using the same procedure to understand how the conclusion was reached. DNA mixture interpretation procedures must be tested on mixture profiles from known contributors representing the range of mixture types (e.g., different numbers of contributors, mixture proportions, and template quantities) to which the procedure will be applied in casework. **The results of this validation must be used to define the capabilities and limitations of the procedure and to verify that it produces the expected results (*e.g.*, inclusions and exclusions).**

[1] http://www.ascld-lab.org/board-of-directors-interpretations-on-dna-testing-services/

As ASLCD/LAB members are aware, the primary characteristics of DNA interpretation performance with short tandem repeat (STR) markers (*e.g.,* amount of stutter and heterozygote peak height balance at each tested locus) are best assessed with single-source samples. What must be considered for DNA mixture interpretation is the allele stacking effects that may occur when two, three, four, or more contributors are part of a forensic DNA sample and the impact of potentially missing genetic data.

Many crime laboratories in Texas have interpreted the ASCLD/LAB announcement as requiring them to process hundreds of complex DNA mixtures to meet the proposed general validation requirements that would be necessary to generate an interpretation protocol. The Commission understands and agrees with ASCLD/LAB that laboratories performing mixtures with multiple contributors should be able to *verify* their current DNA mixture protocols perform appropriately with mixtures containing two, three, four (or more) known contributors. However, the Commission believes *verification* is different from requiring the extensive *validation* that many laboratories are concerned must be performed by December 1, 2015.

To provide clarity to the laboratories, the Commission requests ASCLD/LAB's response to the following questions:

1. Is it the intention of ASCLD/LAB to require laboratories to test hundreds of possible combinations of DNA mixtures as part of an extensive validation study (*e.g.,* four person mixtures with ratios such as 1:1:1:1, 1:1:2:1, 1:2:1:3, 9:3:1:1, … at 1 ng total, 500 pg total, 250 pg total, etc.)? Based on well-established principles of molecular biology and allele stacking, we do not consider an extensive study to be necessary, reasonable or practical.

2. If the above is not the intention of ASCLD/LAB, then can we assume the intention is a careful verification of current DNA mixture protocol performance with a fewer number of mixtures containing two or more known contributors sufficient to determine whether laboratory protocols are effective?

3. What is the intention with regard to relatives (*e.g.,* should non-contributor relatives be assessed against a multi-person test mixture)?

4. If relatives are intended in the ASCLD/LAB requirements, how many mixtures should be tested to understand the capabilities and limitations of a laboratory's interpretation protocol?

In light of the December 1, 2015 deadline, the Commission requests a response from ASCLD/LAB as soon as possible regarding these questions as well as a few examples of how laboratories may successfully fulfill the requirements set forth above. If ASCLD/LAB maintains extensive validation studies are necessary, we respectfully request an explanation regarding the scientific basis for such a conclusion.

We are grateful to Drs. Frederick Bieber, Bruce Budowle, John Butler and Michael Coble who have provided valuable input to the Commission regarding the ASCLD/LAB announcement

and have assisted the Commission in framing the questions contained herein. These esteemed scientists agree with the Commission that the key outcome for laboratories should be *verifying* current mixture protocols perform properly with two, three and four (or more) person mixtures.

We look forward to hearing from ASCLD/LAB regarding the Board's intentions with respect to the announcement. If you have any questions, please feel free to contact the Commission's general counsel, Lynn Garcia, at lynn.garcia@fsc.texas.gov or (512) 936-0649.

Sincerely,

Vincent J.M. Di Maio, M.D.
Presiding Officer