B62 The Implementation and Evaluation of a Blind Proficiency Testing Program

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After attending this presentation, attendees will learn how to implement a blind proficiency testing program.

This presentation will impact the forensic community and/or humanity by demonstrating the potential development of proficiency testing more applicable to specialized laboratories.

The participation in proficiency testing is a critical part of a forensic DNA laboratory. In fact, it is a requirement of the American Society of Crime Lab Directors Laboratory Accreditation Board (ASCLD/LAB) and FBI Quality Assurance Standards (QAS) that every DNA scientist in an accredited laboratory be tested biannually for the techniques in which they have been trained and use regularly, while other forensic scientists are required to be tested annually. Each scientist should be evaluated to ensure that they are following the correct procedures and can determine the correct conclusions. There are several ASCLD/LAB accredited proficiency test vendors that are suitable for this requirement, providing database samples and samples mimicking those found at a crime scene. However, for labora- tories that generate DNA profiles from atypical forensic samples, profi- ciency testing can be a challenge.

The disadvantages of the commercial proficiency testing kits for a lab- oratory such as the Armed Forces DNA Identification Laboratory (AFDIL) is that most of the in-house scientists process skeletal remains using mitochondrial DNA (mtDNA) analysis for which no commercial kit is available. In addition, these skeletal remains are usually highly degraded due to being subjected to harsh environments for over 30 years. The assays required to achieve successful testing require the analyst to push the envelope of the system which is highly dependent on good technique, con- tamination control, and strict interpretation guidelines. In order to test the protocols, the AFDIL has been participating in a blind proficiency testing program in collaboration with the Joint POW/MIA Command - Central Identification Laboratory (JPAC-CIL) for the past eight years. For these tests, JPAC-CIL submits a sample that has been previously processed by the AFDIL with a known sequence. The sample is sent and processed as a regular submission with only the primary DNA Manager of CIL knowing which sample is intended as a proficiency test. Once processing is com- plete and reported, the DNA Manager informs the technical leader of the mtDNA section and the laboratory director of the results.

The mtDNA blind proficiency testing program has been so successful that an in-house blind proficiency testing program has been created for the nuclear DNA Section. This section primarily processes fresh tissue samples to aid in the identification of soldiers lost during current military incidents. Due to the nature of the incident, intense pressure is placed on the analysts to complete a case within 48 hours of receipt. This sort of pressure and expeditious testing is not required for traditional vendor pro- ficiency tests nor are tissue samples provided. The blind testing for this section includes samples submitted through the medical examiner system as both regular and stat cases, to simulate the urgent need to generate an accurate profile. While the program is still in its infancy, the early results are highly promising.

As more forensic laboratories explore the potential of DNA for both identification of missing persons and the conviction of criminals, gener- ation of profiles from atypical sources of evidence will come more to the forefront. There will be a real need for laboratories to accurately test their resident scientists in the treatment and testing of samples they see daily. Designing an in-house or shared blind proficiency testing program is one avenue to explore. The advantages, implementation, and results of AFDIL's program will be presented, as well as suggestions to other labora- tories that focus on specialized samples for the implementation of their own blind proficiency testing program.

The views expressed herein are those of the authors and not The Armed Forces Institute of Pathology, The U.S. Army Surgeon General, nor the U.S. Department of Defense.

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