A55 Examples of Database Lab Case Approach for Chimeric Samples

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After attending this presentation, attendees will see two different examples of chimera data sets from convicted offender DNA samples that were received as part of the convicted offender program in Washington State. Chimerism has been defined as the presence of two genetically distinct cell lines in an organism. The troubleshooting and follow-up work to eliminate contamination as a possibility and confirm these two individuals as chimeras will also be presented.

This presentation will impact the forensic science community by providing two different examples of chimeras to study and deliberate about analysis and interpretation strategies.

DNA samples received by the Washington State Patrol (WSP) CODIS Laboratory are typically buccal cells transferred to FTA paper. One such DNA sample was received for a convicted offender by the WSP CODIS Laboratory and was initially typed by an outsourcing laboratory. The results were an apparent mixture. The same mixture was observed when the sample was re-typed in-house with the same amplification kit. After a search against the staff elimination database yielded no results, it was initially assumed that the sample had been contaminated by the collecting agency. Years later, another sample was received for the same individual by the WSP CODIS Laboratory and typed by a different outsourced lab using a different amplification kit. A mixed profile was obtained. In-house typing resulted in the same profile. Research into whether or not a duplicate submission had been received for the individual was conducted and the earlier sample submission was noted. Comparison of the “mixed” profiles from all four typing attempts resulted in the same profile.

A similar situation occurred with a DNA sample received for a different individual. In this case, the sample was extracted twice in-house and resulted in the same apparent mixture. A duplicate sample taken by a different collector was received about a month later. The duplicate sample was typed and the same mixed profile was seen.

Both profiles were determined to be eligible for upload to NDIS. Attempts to collect additional tissue or body fluid samples were unsuccessful.

Samples from both individuals were sent to NIST for further analysis. At the time of this writing, the results had not been returned. If the results are available at the time of the poster presentation, they will be presented as well.

This poster provides two different examples of chimeras. For analysts in DNA databasing laboratories, there is an expectation for a single-source profile; mixed profiles are generally assumed to be contamination. Where possible, typing a duplicate sample for an individual could provide additional confirmation of whether or not the sample was contaminated or if it is exhibiting chimerism. For DNA casework laboratories, mixtures are assumed to be from multiple contributors. While chimeras are rare, they are a possibility. Typing of reference samples may or may not exclude this possibility, as chimeric profiles may only be observed in one body fluid or tissue and not another. **Chimera, DNA, CODIS**

 ** Presenting Author*