E78 When the Confirmation Sample Doesn't Match the Profile Entered Into the Combined DNA Index System (CODIS): Troubleshooting the High-Throughput Database Process

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Learning Overview: After attending this presentation, attendees will be aware of the need to verify the accuracy of profiles obtained from database samples.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by alerting scientists to the possibility of a DNA profile being incorrectly associated with a specific database sample and of a strategy created by the Maryland State Police-Forensic Sciences Division (MSP-FSD) to efficiently troubleshoot this issue and correct any identified errors.

A CODIS hit occurred at Maryland's State DNA Index System (SDIS) level between a database sample and a forensic profile from one of the Local DNA Index System (LDIS) laboratories. The LDIS laboratory requested the match be processed for the offender's information. Prior to releasing the offender's information to the requesting agency, MSP-FSD procedure requires any database sample involved in a hit to be tested a second time to confirm that the original profile entered into CODIS was correct. The confirmation testing of this specific sample produced a different profile when compared to the original profile entered into CODIS. This discrepancy led to an immediate investigation and the samples involved were re-tested to obtain the correct DNA profiles. Upon completion, the CODIS hit was re-generated to the correct database sample and the offender's information could then be released to the requesting agency in relation to the CODIS hit.

During the troubleshooting of the original incident, scientists determined the error may have occurred during the initial testing of the database samples and may have been due to a sample punch landing in a different well than expected during the automated processing. It was also determined that this error may be more widespread than initially believed. Scientists determined the troubleshooting would require the investigation of all database samples with duplicate profiles in CODIS. Nearly 23,000 duplicate matches, involving more than 45,000 samples, were researched to verify their accuracy. MSP-FSD scientists developed a method to automate a majority of the research into each of these, therefore reducing the number of samples that needed to be manually researched.

During the troubleshooting process, scientists found that, in addition to the original error detected during the hit confirmation, there were other types of errors occurring in the system that needed to be researched and addressed. These errors were occurring prior to receiving the sample at the laboratory, during the collection process, and while being processed in the laboratory. Procedures were put in place at MSP-FSD to identify and correct all types of past issues that were identified. Procedures also needed to be created and implemented to detect and address any newly identified errors in a timely manner moving forward. Thankfully, none of the identified errors resulted in MSP-FSD missing a CODIS hit; however, this incident did bring to light potential threats that could impact other CODIS laboratories.

CODIS Hit, Troubleshooting, High-Throughput