B77   Automation of Buccal Swab Processing

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Attendees will learn about an automated method for introducing buccal swabs into the DNA profiling laboratory which assures sample integrity and reduces the man hours currently required to process buccal swab samples.

This presentation will impact the forensic community and/or humanity by demonstrating how the current methods for introducing buccal swabs into the dna profiling laboratory are labor intensive due the need for a witness and if not performed correctly, can lead to sample mixups. The presentation will provide the forensic community with a method to rapidly and accurately introduce buccal swabs into the DNA profiling laboratory in order to efficiently and effectively address the ever-increasing number of samples which must be processed.

The testing of buccal cells on cotton-tipped, Dacron®, or sponge applicators in large scale DNA profiling is desirable. The collection of the sample is non-invasive, relatively easy to perform, and collection materials are inexpensive. If collected properly, the cells on the swab yield a sufficient quantity of DNA for STR profiling. Presently, large scale sample introduction or aliquoting practices require manual cutting of the swab and placement into the correct well location in a 96 well tray or into individual tubes. Although this direct transfer of cells from the swab is more reliable and less expensive than performing an initial transfer to paper, the process is labor intensive due to witness requirements, and can lead to sample mixups, if not performed properly. With the prospect of collecting over 100,000 buccal swab samples per year in the State of Louisiana, an automated method for introducing buccal swab samples directly into the laboratory testing process was developed. This system reads and records the sample identification number, cuts the buccal swab using a non-contact laser-based method to prevent contamination and automatically places the swab into a designated location in a 96 well tray. The automated self-tracking system assures sample integrity and reduces the man hours currently required to process buccal swab samples.

To demonstrate the effectiveness of this technique, cotton tipped and Dacron® buccal swabs were collected using standard methods. Two swabs were collected from each individual. One swab was cut using the noncontact cutting device, while the other was cut manually by a razor blade. The DNA yields between the samples were comparable, and the samples cut with the laser showed no PCR inhibition or artifacts in the resulting DNA profiles as compared to their controls. A description of the noncontact laser cutting unit and system management software will be presented along with results from proof-of-concept studies and field experience.

Buccal Swab, Automation, DNA Profiling