B82   Comparison of Buccal Cell Collection Methods

Amanda M. Kleist, BS, Tammy P. Northrup, BS, JD, Darrel J. Oubre, Jr., BS, Natasha H. Poe, BS*, and Alyson Saadi, BS, Louisiana State Police Crime Laboratory, 376 East Airport Drive, Baton Rouge, LA 70806; Amanda C. Sozer, PhD, DNA Technology Consulting Services, LLC, 10418 Hampton Road, Fairfax Station, VA 22039; Mark Tourre, MSFS, Janaki Vaidyanathan, MS, MT, and Joanie B. Wilson, MT, Louisiana State Police Crime Laboratory, 376 East Airport Drive, Baton Rouge, LA 70806; and Patrick W. Wojtkiewicz, PhD, North Louisiana Criminalistics Labortory, 1115 Brooks Street, Shreveport, LA 71101

Attendees will learn the most effective and reliable buccal cell collection method(s) for DNA databasing samples.

This presentation will impact the forensic community and/or humanity by presenting the most effective and reliable buccal cell collection method(s) for DNA databasing samples for a high throughput laboratory resulting from large volumes of DNA sample collections.

This presentation will present the research performed at the Louisiana State Police Crime Laboratory to determine the most effective and reliable buccal cell collector samples for databasing samples. Louisiana currently has the most widespread and far reaching DNA databasing law in the country. This law expressly authorizes the collection of arrestees' DNA for databasing purposes. The State of Louisiana has opted to utilize buccal cell collections for all arrestee testing. In order to effectuate this comprehensive databasing collection law, members of the Louisiana State Police Crime Laboratory DNA Unit along with the Unit's contract Technical Leader and CODIS Consultant initiated research to determine the most reliable and cost efficient buccal cell collection method. The results of this research will be applied to Louisiana's existing arrestee databasing program as well as any expansions thereto.

Buccal swabs rather than blood samples are becoming the preferred method of DNA sample collection for high volume DNA profiling laboratories because of the minimized health risks, the relative ease of collection and shipping, as well as low costs associated with this method of collection. Currently, collecting an adequate buccal cell sample in a simple, fast, consistent and cost-efficient manner, while retaining the ability to store the sample, is one of the biggest challenges facing DNA profiling programs. With the anticipation of collecting over 100,000 buccal samples per year in Louisiana, a study was undertaken to compare the consistency and effectiveness of available buccal cell sampling methods and devices. The purpose of this study was to evaluate the DNA yield, the ability to obtain a successful profile, and the efficiency of sample storage using various buccal cell collection methods in order to select the most effective collection method for the State of Louisiana.

Nine different collection methods were used to collect buccal cells from sixteen subjects over a five-week collection period using a collection scheme designed to minimize variability of other factors which might influence buccal cell yield. Collection methods included the Omni Swab collector, Bode Buccal DNA collector, and the Fitzco SampactTM Swab collection device. Additionally, Pur-Wraps® sterile Dacron® polyestertipped applicator, sterile foam-tipped applicator, and sterile foam-tipped applicator transferred to Whatman® Indicating FTA® Micro Card were collected. Three collections were also performed using the Pur-Wraps® sterile cotton-tipped applicator. These methods included one individual collection, one that was transferred to Whatman® FTA® Micro Card, and one that was transferred to Whatman® Indicating FTA® Micro Card.

The samples were extracted according to a standard protocol which utilized the QIAamp® DNA Mini Kit (Qiagen Inc.). The amount of DNA recovered was determined by both QuantiBlot® and QuantifilerTM Human DNA Quantitation Kits (Applied Biosystems). The samples were amplified with the AmpF/STR® Profiler PlusTM and AmpFlSTR® CofilerTM PCR Amplification Kits. Profiles were generated on the ABI Prism® 3100 Genetic Analyzer and evaluated using Genescan® analysis software (version 3.7.1) and Genotyper® (version 3.7) according to laboratory protocols.

A comparison of DNA yields, reliability and reproducibility of DNA profiles, quality of profiles, and ease of storage among the different collection methods will be presented.

Buccal, Collection, Databasing