



### A166 Alternative Sexual Assault Kit Processing

*Michael A. Donley, MS, and Roger Kahn, PhD, Harris County Institute of Forensic Science, 1885 Old Spanish Trail, Houston, TX 77054; Christy Smejkal, MS\*, Harris County Medical Examiner's Office, Forensic Biology Section, 1885 Old Spanish Trail, Houston, TX 77054; and Michal L. Pierce, MS, Harris County Medical Examiner's Office, 1885 Old Spanish Trail, Houston, TX 77054*

After attending this presentation, attendees will understand the pros and cons of an alternative approach to processing sexual assault kits. This presentation will aid attendees in deciding the method to use when processing sexual assault kits. Presented here are the results after implementing the alternative processing method and its comparison to the traditional method.

This presentation will impact the forensic science community by demonstrating an alternative method of processing sexual assault kits and the impact it will have on the evidence being processed.

In 2010, the Harris County Institute of Forensic Sciences Forensic Genetics Laboratory (HCIFS) initiated the use of an alternate processing scheme for sexual assault kits. A portion of each available swab is cut and sent directly to differential extraction without presumptive or confirmatory testing for semen or saliva. This is done regardless of the information in the complainant's narrative. Vaginal, anal, oral, debris swabs (i.e., breast, neck), and swabs of fingernail scrapings are cut and sent directly to differential DNA extraction. The new method simplifies the activities in Serology while greatly increasing the number of samples needing differential extraction. The HCIFS DNA Lab utilizes high capacity robots for DNA extraction, quantitation reaction set-up, sample normalization, and STR reaction set-up, making the large increase in the number of differential extractions possible.

After eight months of processing kits with this method, the results were evaluated for oral swabs, neck swabs, breast swabs, and swabs of fingernail scrapings – locations where semen is not typically present. Vaginal and anal swabs were not evaluated because semen, if present, is typically found on these swabs. Oral swabs from 153 cases were examined. In 131 cases, the samples were terminated (i.e., testing was halted after quantitation) due to a lack of male DNA. Of 22 cases which were amplified, 18 cases were from a male complainant and in all but one of the cases from a female complainant, only the complainant's profile was observed. In the one instance of a male profile in the male fraction of an oral swab, the narrative indicated that an oral assault had occurred. Differential extraction of these swabs does not appear to be necessary.

Differential extraction from neck and breast swabs is not necessary to observe male profiles. In the traditional method (without differential extraction), 50-70% of these samples yielded foreign male profiles. With the new method where debris swabs were tested only by differential extraction, all of the sperm fractions were terminated after quantitation due to a lack of male DNA. For neck swabs, 80% of the non-sperm fractions were amplified and all revealed mixtures that included male profiles. Similar results were seen in swabs from fingernail scrapings. Again, this indicates that differential extraction of these samples is not helpful since semen is not typically present on these swabs.

These results suggest a combination approach. Vaginal and anal swabs should continue to be tested without screening in Serology - testing for PSA and for sperm will continue to be conducted during DNA extraction. Oral, neck and fingernail swabs should be subjected to regular, not differential extraction unless the female complainant states in the narrative that the suspect ejaculated on her breast, neck, thigh, etc. If the female complainant reports the suspect licked her breast, neck, thigh, etc. then the swabs should be tested by regular extraction. As an alternative, all such swabs could be screened for PSA. Those that are positive could be differentially extracted.

In any case, the handling will still be more efficient than conducting a full screen in Serology, although a change will increase the work on the Serology lab. Each laboratory can decide which method (traditional, alternative, or a combination) is best suited for their laboratory.

#### **Sexual Assault Kit, DNA Extraction, Processing Time**