**Abstract 3**

## STRATEGIES FOR OBTAINING A DNA PROFILE OF THE MALE DONOR IN EXTENDED INTERVAL (>72 HOUR) POST-COITAL CERVICO-VAGINAL SAMPLES USING COMMERCIAL Y-STR MULTIPLEX SYSTEMS: EXTRACTION TECHNIQUES, POST AMPLIFICATION CLEAN UP AND NOVEL ENZYMES

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Learning Objective: to inform the human identification community of strategies employed to extend the recovery of DNA profiles from the male donor from post-coital samples.

The chief advantage that Y-STRs offer compared to autosomal STRs is the ability to obtain a male profile in the presence of a much larger quantity of female DNA such as is often found with samples from sexual assault cases. Some victims of sexual assault wait to provide vaginal samples more than 36 hours after the incident. In these cases the ability to obtain sperm, and therefore DNA profiling information, from the semen donor diminishes as the post-coital interval is extended. We have previously reported the facile detection of the semen donor DNA profile in cervico-vaginal samples taken up to 72 hours after intercourse. Here, we extended the post-coital period much further, from 72 hours through 168 hours, and analyzed the samples using two commonly used Y-STR multiplex systems, Applied Biosystem's AmpFℓSTR® Yfiler™ Kit and Promega's PowerPlex® – Y System.

Male donor profiles were obtained at 96 and 120 hours post-coitus using a differential extraction method. Surprisingly, a non-differential method, in which 300 ng of DNA is added to the PCR reaction, gave no DNA profiles with $\geq$ 72 hour post–coital samples. In an attempt to further extend the post-coital interval beyond 120 hours (5 days), a post amplification clean up strategy was introduced which can dramatically increase analytical sensitivity as evidenced by increases in peak height of 'called' alleles while permitting detection of alleles previously present below threshold. The uses of post amplification clean up produced full profiles where partial profiles were observed prior. Another strategy incorporated DNA polymerases with proof reading activity into the PCR reaction. These additional strategies enable us to extend the post-coital period even longer. Details of these enhancement strategies will be provided as will the results of the testing of the extended interval post-coital samples.