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A FAST, EFFECTIVE DIFFERENTIAL EXTRACTION METHOD FOR FORENSIC SEXUAL ASSAULT SAMPLES

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Differential extraction is a procedure commonly used on sexual assault samples for the purpose of separating the male and female DNA fractions. The classic differential extraction method often takes up to two days of processing time and is not very effective on samples with a high epithelial to sperm cell mixture ratio. These samples present a challenge to forensic analysts as they do not produce clean, full profiles when STR typing is performed. To this end, Orchid Cellmark Inc. has developed a new method that shortens the overall differential extraction processing time. This new approach requires elution of the cellular material from a sexual assault collection swab prior to extraction. The pellet resulting from the elution step is treated with an optimized extraction buffer cocktail that enhances the specific lysis of epithelial cells. This treatment allows for a cleaner, more effective isolation of sperm cells which subsequently produce cleaner, full profiles that are easy to analyze. A detailed description of this new method and data obtained from the extraction of samples containing various epithelial to sperm cell mixture ratios will be presented.