

## **MODIFICATION OF THE REGULAR DIFFERENTIAL DNA EXTRACTION METHOD FOR SEXUAL ASSAULT KITS**

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Crime laboratories around the country have seen an overwhelming demand for DNA analysis on the backlog sexual assault kits. To efficiently and accurately process this increased demand of sexual assault evidence collection kits, the regular differential DNA extraction method was reevaluated in order to expedite the process. Cotton tipped swabs with mixtures of saliva and semen, and blood and semen, were extracted using a modified differential extraction method. The modifications included increasing the Proteinase K from 5 $\mu$ l to 20 $\mu$ l per sample, and increasing the initial incubation temperature from 37°C to 56°C. The samples were then divided in half, with one half being incubated for one hour and the other half being incubated for two hours. The sperm fractions were then digested with 40 $\mu$ l of 1M DTT instead of 0.39M at 56°C instead of 37°C. The extraction process was continued for each sample using the Maxwell protocol. Quantitation using PowerQuant on 7500RTPCR, amplification using PowerPlex Fusion, and detection on the 3500 Genetic Analyzer was performed on each sample. The modified differential DNA extraction method produced all the expected alleles for the female and male contributors. There was no difference in the one-hour digestion of the epithelial cell fraction when compared with the two-hour digestion. The digestion of the sperm fraction for one hour also showed no difference when compared with the 30-minute digestion. Therefore, this modified differential extraction method, with an initial incubation time of one hour and a sperm fraction digestion time of 30 minutes, can be utilized for a quicker DNA processing time of sexual assault kit evidence.