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Uncovering the Hidden Suspect: Practical Casework Experiences using the Promega PowerPlex® Y System

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There are certain types of forensic evidence that may not be amenable to autosomal STR analysis due to a mixture of male and female DNA. This is most common in rape cases where evidentiary samples include swabs from a rape kit and victim's clothing, and in murder cases that include fingernail scrapings from the victim. These types of mixed evidence samples often have an overwhelming amount of female victim DNA that can mask the probative male perpetrator DNA profile. The use of STR markers specific to the Y-chromosome is an effective way to target only the male DNA in a mixed evidence sample, and may provide a useful DNA result in cases where autosomal STR analysis was unsuccessful.

Y-STR analysis for forensic DNA applications is becoming more and more prevalent, especially now that high quality Y-STR kits have been developed and are available to the forensic community. This poster will describe the robust nature of the Promega PowerPlex® Y kit as it applies to actual casework evidence samples. Casework experiences will be described in which male DNA was either absent or observed at a very low-level during autosomal STR analysis, and then produced a complete Y-STR profile using the Promega PowerPlex® Y system. The Y-STR profile generated from an evidentiary sample could then be compared to a suspect reference sample. In another casework example, a Y-STR result was coupled with a minor component male profile obtained from a mixed autosomal STR result to provide additional data and to strengthen the DNA match with the suspect reference sample. Finally, a comparison between the Promega PowerPlex® Y kit and the Y-STR kit used previously in our laboratory will also be presented.