

ABSTRACT

EVALUATION OF Y-CHROMOSOME SHORT TANDEM REPEAT MULTIPLEXES FOR FORENSIC DNA ANALYSIS

Y-chromosome short tandem repeats (Y-STRs) are loci on the Y-chromosome, which is only present in males. Y-STR technology has the potential to provide male genetic profiles in forensic mixture samples previously impossible to analyze due to low levels of male DNA mixed with high levels of female DNA. This research compared two Y-STR multiplexes, Y-PLEX™12 (ReliaGene Technologies) and PowerPlex® Y (Promega Corporation). Both multiplexes were equally sensitive, providing complete profiles with 250 pg of male DNA. Both multiplexes had anomalies that could interfere with interpretation. Mixture studies indicate that the limit of detection of the minor component in a male: male mixture was 1:5 for Y-PLEX™12 and 1:2 for PowerPlex® Y. While PowerPlex® Y did not provide a full profile when male DNA was mixed with equal amounts of female DNA, Y-PLEX™12 provided a complete Y-STR profile with one hundred times excess female DNA.

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