

A STUDY OF 26 Y-STRS FOR DISCRIMINATION AMONG U.S. POPULATIONS

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Short tandem repeats (STRs) on the Y-chromosome have become a significant tool in criminal forensic research due to the large number of violent acts perpetrated by males. Y-STR data has enabled us to look at haplotypes resulting in enhanced resolution of paternal lineages. A database containing Y-STR haplotypes from markers other than just the “minimal haplotype” will be indispensable to the forensic community in determining haplotype frequencies, improving resolution of shared haplotypes, and providing information regarding population structure. In order to address this issue we typed 26 Y-STRs consisting of: 14 novel Y-STRs, the Y-STRs defining the “minimal haplotype,” and four additional markers. Data from these markers were gathered from three of the major ethnic groups in the United States including: African-Americans, European-Americans, and Hispanic-Americans. Our research demonstrates that combining the novel Y-STRs and the “minimal haplotype” Y-STRs greatly increases discrimination capacity. Our analysis also indicates that there is significant variation among three ethnic groups, but within a specific ethnic group we found non-significant population substructure. These results illustrate the importance of using Y-STRs with higher forensic value in order to attain better discrimination capacities.