

## **GENETIC ANALYSIS OF U.S. POPULATION SAMPLES USING AN X-STR 20-PLEX PCR ASSAY**

Chien-Wei Chang, Lori Hennessy

Life Technologies, 850 Lincoln Centre Drive, Foster City, CA 94404

Due to hemizyosity and a lack of recombination of the X chromosome in males, X-STR typing has been demonstrated in forensic practice to be a powerful tool for complex cases of kinship testing. We have configured a 20-plex X-STR genotyping assay to amplify simultaneously DXS101, DXS6789, DXS6797, DXS6800, DXS6807, DXS6810, DXS7132, DXS7133, DXS7423, DXS7424, DXS8377, DXS8378, DXS981, DXS9895, DXS9898, DXS9902, GATA165B12, GATA172D05, GATA31E08, and HPRTB in a single PCR reaction. The use of 5-dye technology and non-nucleotide linkers on primers ensures no overlap between marker ranges during capillary electrophoresis analysis and genotyping can be performed using the Applied Biosystems 3130/3130xl/3500 Genetic Analyzers. This X-STR multiplex PCR amplification assay has been tested to produce reliable and accurate X-STR genotyping data, the results of which have been confirmed by sequence analysis. Allele frequency, genetic diversity, and forensic efficiency parameters are reported based on a large selection of US population samples together with an evaluation of the advantages afforded by increasing multiplex complexity in resolving common haplotypes. Information obtained from this study point to the utility of such a multiplex for use in complex kinship investigations.