B78 Developmental Validation of the AmpF*l*STR® MiniFiler™ PCR Amplification Kit: A 9-Plex MiniSTR Assay for the Analysis of Compromised DNA Samples

Robert E Lagace, BS, Julio Mulero, PhD, Chen-Wei Chang, PhD, Dennis Wang, PhD, and Lori Hennessy, PhD, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, CA 94404*

The goal of this presentation is to share the results from the developmental validation and customer test site evaluation of a new mini STR assay, AmpF*l*STR® MiniFiler™ PCR Amplification Kit with compromised DNA samples.

This presentation will impact the forensic community and/or humanity by providing information on the AmpF*l*STR® MiniFiler™ STR kit which will be useful for genotyping degraded and/or inhibited DNA casework samples which had failed in previous standard STR kits and for special circumstances such as missing persons, and mass disaster victim identification.

Forensic DNA typing is facilitated by the employment of highly polymorphic STRs. Despite the relatively small amplicon sizes (100 - 400 bp) of previous STR kits, DNA degradation due to environmental exposure can result in a lack of sufficient intact target fragments to generate a complete genetic profile. This problem is exacerbated by large multiplex STR configurations due to the wide fragment size range of amplified PCR products. Frequently, in large multiplexes, the largest STR loci fail to amplify in degraded DNA samples due to the lack of sufficient template DNA.

In recent years, successful recovery of information from degraded DNA samples has been accomplished through reduction of the size of the STR PCR products by moving primers in as close as possible to the STR repeat region. In an effort to increase the amount of information derived from compromised DNA samples, as miniSTRs, the largest eight loci in the AmpF*l*STR® Identifiler® PCR Amplification Kit (D7S820, D13S317, D16S539, D21S11, D2S1338, D18S51, CSF1PO,
FGA). Five of these loci (D16S539, D21S11, D2S1338, D18S51 and FGA) also represent five of the largest loci in the AmpF*l*STR® SGM Plus® kit have been redesigned. Size reduction of the STR amplicons ranged from 33 to 208 bp. This highly informative 9-locus multiplex, which includes the sex determining locus Amelogenin, employs a 5-dye labeling technology and non-nucleotide linkers to enable simultaneous CE separation of the DNA fragments.

MiniSTR, Degraded DNA, PCR Inhibition

 ** Presenting Author*