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ABSTRACT

We have previously developed the AmpFSTR™ NGM SElect™ Kit for use in approximately 150 forensic science laboratories in the United States and several other countries. The Kit allows for robust, accurate DNA analysis of forensic casework samples. We have now extended the nationwide availability of this Kit by offering a new Kit that includes the SE33 locus in a multiplex format. This new Kit allows for the characterization of all STR loci in a single reaction, and can be used to analyze both fresh and degraded DNA samples. We have developed a new SE33 multiplex PCR protocol that optimizes the number of cycles to reduce the risk of incorrect designation, while maintaining the robustness and sensitivity of the assay. This new Kit also includes the SE60 and SE82 loci, which are highly polymorphic and can be used to improve the identification of individuals in complex cases.

RESULTS

Figure 1: Reaction Components and PCR Conditions

Figure 2: Genotype Locus Configuration

Figure 3: Designing the NGM SElect™ Kit to avoid SE33 mobility-shift discordance

Figure 4: Additional primers for amelogenin, D22S1045 and D2S441 in the NGM SElect™ Kit to allow detection of SNP-affected alleles

Figure 5: SE33 allele length was increased relative to the SEfiler Plus™ Kit so that the loci could fit into the available space in the NGM SElect™ Kit. All other markers in the multiplex have exactly the same mobility as in the NGM™ Kit.

Figure 6: NGM™ kit electricophoretic profile for 0.5 ng of 007 human control DNA

Figure 7: Sensitivity study with a dilution series of 07 human genomic DNA

Figure 8: Degraded DNA study with the NGM™ SESelect™ Kit vs. SEfiler Plus™ Kit

Figure 9: Two series of test samples were formulated, containing increasing concentrations of human DNA. Oligo DNA was added to the 0.5 ng target DNA levels to simulate degraded forensic casework samples. DNA samples were sonicated and then treated with increasing concentrations of humic acid samples, amplified with the NGM™ SESelect™ Kit, NGM™ Kit (top three panels) and the SEfiler Plus™ Kit (bottom panel). The improved PCR chemistry of the NGM™ and NGM SESelect™ kits allowed greatly enhanced detection of alleles at high levels of PCR inhibitor compared to earlier generation kits.

Table 1: Population and Probability of Identity calculations

Table 2: Genotype frequency data for the SGM Plus® Kit, SESelect Plus™ Kit and NGM™ and SEfiler Plus™ Kits

Table 3: Comparison of the new Kit with earlier generation kits.

Table 4: Comparison of allele frequencies for the SE33 loci in the new Kit with earlier generation kits.

Table 5: Allele frequencies for the SE33 loci in the new Kit with earlier generation kits.

Table 6: Conclusions

Table 7: Acknowledgements

TRADEMARKS/LICENSING

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