EVALUATION OF A FORENSIC STR-MULTIPLEX SYSTEM WITH PARAFFIN-EMBEDDED TISSUES

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In forensic cases, paraffin-embedded tissues are sometimes the only biological material submitted as reference or evidence materials for the identification of remains and biological stains or for paternity testing.

Experiments were performed with 15 biopsy and 10 forensic post-mortem paraffin-embedded tissue samples to evaluate the efficiency of eleven PCR-STR and the amelogenin loci using the SGM Plus™ Multiplex Kit and a HUMACTBP2 (SE33) singleplex reaction. Phenol-chloroform/Centricon™ 100 and QIAamp® extraction procedures were used. Frozen tissues and post-mortem blood samples were used as reference samples.

Complete SGM Plus™ profiles were obtained in 32% and 40% of the samples while partial AGM Plus profiles were obtained in 60% and 52% of the samples using phenol-chloroform and QIAamp® extractions respectively.

These partial profiles can be explained by negative PCR amplification and allelic drop out in the majority of the samples. We also observed some artifacts as extra peaks and “off-ladder” alleles.

Considering the conclusive results in respect to each STR locus, the success rate was between 92% and 34% for the phenol chloroform extraction and between 92% and 42% for the QIA Amp® extraction with the best performance for Amelogenin, D3S1358 and D19S433: these STR loci have the smallest amplicon size between 106 and 142 bp.

For the singleplex HUMACTBP2, the success rate was between 80 and 88% depending on the extraction procedure.

To illustrate this work, we report a paternity case with 14 weeks paraffin embedded foetal tissue.