A56 Direct Amplification of Genotyping From Scrape Tissues

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After attending this presentation, attendees will be able to determine when the sample size is inadequate for conventional extraction or when rapid DNA typing, a simpler and higher yield method for genotyping from human soft tissues, is required.

This presentation will impact the forensic science community by demonstrating how a new method of direct amplification genotyping is sufficient and suitable for further PCR diagnosis screening.

Every year a number of disasters occur throughout the world, claiming the lives of thousands of individuals. These disasters may occur due to many reasons but are broadly classified as environmental, medical, industrial, vehicular, and terroristic. In case of disasters, many genetic analyses require isolation of genomic DNA not only from blood, but also from various kinds of human soft tissues. However, it is a common experience that the DNA extraction procedure is time consuming and results in loss of some DNA. In order to address the situations when the sample size is inadequate for conventional extraction or when rapid DNA typing is required, a simpler and higher yield method has to be developed. Scrape preparations were collected from seventeen autopsied individuals. Approximately 0.5 g each of liver, lung, kidney, and heart tissues were obtained from each individual. The genotypes of D1S80, 15 STR loci D8S1179, D21S11, D7S820, CSF1PO, D3S1358, TH01, D13S317, D16S539, D2S1338, D19S433, vWA, TPOX, D18S51, D5S818, FGA,
and Amelogenin were investigated using 0.5 mg of scrape tissue yielding over 70 ng/µl of DNA in 500 µl of digest buffer. The genotypes of the D1S80 locus were successfully identified from 0.5, 1.0, 1.5, 2.0, 2.5, or 3.0 mg of scrape preparation for all seventeen cases. Multiplex STR analysis was conducted using different amounts of scrape preparations from four tissues in all cases. The results indicated that when the amount of tissue was less than 2.0 mg, the STRs were genotyped from the DNA templates in the digests in all cases. This study has demonstrated for the first time the ability to isolate a good quantity of DNA from minute amounts of tissues. The yield of DNA is sufficient and suitable for further investigations such as PCR diagnosis screening when rapid DNA genotype is necessary. A second important result of the present study is that the simple DNA isolation procedure can avoid contamination, which may occur during complicated DNA extractions.

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