RAPID DNA TESTING APPROACHES FOR REFERENCE SAMPLES

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Current methods of forensic DNA typing are currently conducted in approximately 8 to 10 hours. The process includes DNA extraction, quantitation, multiplex PCR amplification, and fragment length detection. Advances in extraction, multiplex polymerase chain reaction (PCR), and fragment separation have aided in reducing the time required to generate a complete short tandem repeat (STR) profile. Advances in extraction include, automated extraction and liquid extraction technologies. Multiple advances have been made in recent years to PCR multiplex kits, to include new buffers, improved polymerases, and faster thermal cycler technologies. Each of these advances has dramatically reduced the required time for PCR amplification. Technology such as the 3500 Genetic Analyzer has also reduced the time required to separate and detect an STR profile to about 38 minutes per 8 samples.

Techniques will be examined for single source samples throughout the entire DNA typing process to reduce the time required to generate a profile from the time a sample has been collected. Several methods which include automated extraction, liquid based extraction protocols, direct PCR for buccal swabs and blood cards, and rapid PCR protocols will be examined. The differences between current DNA testing methods and the rapid techniques will be evaluated. Results will illustrate the typing of a full STR profile in less than 2 hours with current instrumentation commonly available in forensic laboratories. ⌘