H121 An Evaluation of a New Rapid DNA Platform for Field-Forward Applications

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The goal of this presentation is to educate attendees about the performance of a second-generation Rapid DNA genotyping platform.

This presentation will impact the forensic science community by reporting on an evaluation of the first (to this study's knowledge) fully automated second-generation Rapid DNA genotyping platform. This is impactful as the Federal Bureau of Investigation (FBI) has established new Quality Assurance Standards (QAS) guidelines for fully automated Rapid DNA genotyping platforms.

Utilization of a Rapid DNA platform to generate uploadable DNA profiles within and/or outside the traditional laboratory setting can be instrumental in improving workflow and reducing backlogs for DNA typing. The RapidHIT® ID system is a new second-generation Rapid DNA system that is configured to perform DNA extraction, Polymerase Chain Reaction (PCR) amplification, electrophoresis, and data analysis of reference swabs with an expert system to generate forensic DNA profiles comparable to traditional bench systems. The RapidHIT® ID system has a novel design that reduces its footprint and number of samples that must be run at any one time.

Reliable Short Tandem Repeat (STR) profiles from reference buccal swabs were obtained with nominal "hands-on" sample loading time and with a significant enhancement of workflow compared to the first-generation Rapid DNA systems. The RapidHIT® ID system was tested for reliability, concordance, reproducibility, and lack of contamination. Interpretation and sensitivity thresholds were determined, and even though the system is designed for reference buccal swabs, studies determining the effects of sample age, inhibitors, sample mixtures, and sample collection methods were performed. The new instrument provided results comparable with those from traditional DNA genotyping methodologies. Additionally, evaluation of the onboard expert system's capacity to generate fully automated STR profiles in accordance with the updated definition of Rapid DNA analysis as described in the December 2014 addendum to the FBI's QAS regarding Rapid DNA testing was performed.

Rapid DNA, Automated Genotyping, Arrestee STR Profiles

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