B123 Validation of PCR Reaction Setup Protocols for the Quantifiler Human DNA Quantification and AmpF*l*STR® Identifiler® PCR Amplification Kits on the BioRobot Universal System

Shawn Montpetit, MSFS, and Patrick T. O'Donnell, PhD, San Diego Police Department, Crime Lab, 1401 Broadway MS 725, San Diego, CA 92101; and Daniel Langendoerfer, PhD, Alexander Vial, PhD, Thomas Schnibbe, PhD, and Helge Lubenow, PhD, QIAGEN GmbH, Qiagen-Straße 1, Hilden, 40724, GERMANY*

The goal of this presentation is to share validation and customer evaluation data for the downstream PCR reaction setup of Quantifiler™ and Identifiler® PCR assays on the BioRobot Universal System, a new platform for automated medium- to high-throughput extraction of forensic DNA evidence.

This presentation will impact the forensic community by enabling forensic investigators to combine casework or reference nucleic acid extraction in an automated workflow with downstream quantification and STR profiling reaction setup. The resulting integrated workflow minimizes hands-on times and enhances accuracy, consistency and reproducibility.

Forensic DNA laboratories continue to experience increasing submission of samples. Main drivers are legislative changes regarding the acquisition of reference or database samples, and increased utilization of molecular evidence in crime scene investigational work. A logical response to throughput increase is process automation and integration. Robotic equipment allows not only to cope with mounting sample volumes but also to improve process quality of in terms of variability and consistency of results. Additionally, valuable human resources are set free from stereotypic manual procedures and can focus on where they are needed most, such as advanced forensic techniques, result interpretation, and expert opinion.

Based on 96-well format silica membrane technology, a fully automated system was developed for the medium- to high throughput extraction of genomic DNA from both, reference database and demanding case work samples. To integrate the workflow further, reaction setup protocols have been developed for the platform to feed into downstream DNA quantification and STR profiling assays.

This presentation summarizes validation studies of PCR reaction setup protocols utilizing Quantifiler™ Human DNA Quantification and AmpFLSTR® Identifiler® PCR Amplification Kits on the BioRobot Universal System, newly released by QIAGEN.

Validation of the automated platform included processing mock forensic samples through DNA extraction and the different reaction setup protocols. Additionally, spiked swabs alternating with water blanks run in checker board patterns provided data for cross- contamination studies.

The platform reliably generated DNA extracts from the validation cohorts. The BioRobot Universal System's ability to run through extraction and PCR setup without contamination was demonstrated.

Automation, PCR Reaction Setup, Nucleic Acid Extraction

 ** Presenting Author*