GENEBENCH-FX™, A RUGGEDIZED MICROFLUIDIC-BASED DNA SEPARATION AND DETECTION SYSTEM FOR FIELD FORWARD HUMAN IDENTITY TESTING

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A major challenge for performing Human Identification in a field forward environment is the development of a robust, easy to operate instrument that is ruggedized and offers reliable and reproducible performance. NetBio's goal is to develop a fully integrated system that enables rapid sample-in to results-out functionality for human identification from forensic samples. This integrated system utilizes microfluidic technologies provide performance advantages through miniaturization and automation based on integration of fluidic components. The system is divided into three modules: DNA extraction, purification and quantitation, multiplexed STR amplification, and separation and detection. The ruggedized, integrated system will perform sample-in to results-out analysis of forensic samples in approximately 30 minutes.

This presentation will focus primarily on the performance of the separation and detection module, which is now completed, in a simulated field forward environment. The Genebench FX™ instrument is based on electrophoretic separation and laser-induced fluorescence detection. Separation takes place in a microfluidic biochip which can process 16-samples simultaneously. The biochip accepts samples of extracted DNA that have been amplified and prepared with commercial STR kits. The instrument works with 4 and 5 color dyes sets, and can be readily adapted for detection of 6 color dye sets. This system incorporates a shock and vibration dampening system, has low power consumption and is easy to break-down and setup. Data to be presented will demonstrate that Genebench-FX™ Series 100 meets or exceeds all the requirements for analysis of STRs with respect to both technical operation and reproducibility, following transport and in mobile shelters. Taken together demonstrate accurate and reproducible STR separations with better than single base pair resolution in a field forward environment.