B163 Integration of Robots, LIMS, and Software to Customize High Volume Sample Handling, Analysis, and Reporting

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After attending this presentation, attendees will better understand DNA analysis process improvement utilizing robotics, LIMS, and expert software.

This presentation will impact the forensic science community by minimizing analyst hands-on time per sample.

Creation and application of the CODIS national database has created an enormous demand for DNA profiling. Several new aspects of automation systems will be discussed that permitted the authors to accomplish analysis of more than 200,000 samples for more than twenty clients employing three primary extraction methods, three different quantification methods, and eight multiplex STR systems each with a diversity of client protocol and interpretation requirements.

The solution employs the following interactive components:

1) Trained analysts. In our environment, the trained analyst still performs numerous critical tasks and provides proper care in handling both sample material and data while interacting with and facilitating flow of the entire automated system.

2) LIMS. Internal LIMS development to support sample accessioning, inventory tracking, chain-of-custody, laboratory methods set up, and data reporting.

3) Robots. The Hamilton and other robotic platforms permit multiple functionalities and constant adaptation to system component upgrades (e.g., new extraction methods or new multiplex system requirements).

4) BodeChecks. This software solution uses information technology to combine key features of GeneMapper, FSS-i[3], our internal LIMS, and our internally developed connective and analytical software to provide a high quality data evaluation and simplified data presentation for analysis.

All of this has been created to provide the highest quality data, the lowest potential for sample mix up or contamination, the most efficient means of sample analysis, simplified organization and generation of data files, minimization of transcription errors, and the greatest confidence in the reported result. Each of the items indicated above, and the interactive nature of the system, will be discussed. This effort is a work in progress, but provides scalability to support evaluation of millions of samples annually and the flexibility to import new methods and procedures as they are developed internally or become available from outside the system.

Automation, Expert System, LIMS