

Next Generation Forensic DNA Instrumentation Solutions from Hamilton Robotics

Within all areas of forensic science, there is an ongoing need for new strategies and techniques and the development of matching instrumentation.

The modern forensic DNA crime laboratory constantly seeks ways to reduce casework backlogs – and to rethink DNA sample preparation and analysis processing using instruments that are robust and performance-verified. Thus, it is crucial that instrumentation is designed to meet the capacity, but also to fit to the physical and technical support limitations of both small and large throughput forensic DNA laboratories.

Over 400 Hamilton robotic installations in crime labs worldwide are being used to address daily sample processing needs and relieve backlogs. These installations have enabled forensic scientists to develop improved solutions for DNA processing and to shorten time for data analysis and reporting. The knowledge acquired from this large customer base has given Hamilton Robotics a remarkable position, gaining expertise for database, casework and reference sample processing. This experience has led to the automation of a sizeable number of widely used vendor kit assays - from DNA extraction to PCR setup and additionally CE setup.

Hamilton Robotics has developed a range of dedicated solutions and new technologies for forensic DNA analysis. Those include the systems in the following.

ID STARlet

This forensic workstation fully automates an entire suite of verified forensic DNA methods. Developed in collaboration with LifeTechnologies, the ID STARlet automates all steps of the PrePCR casework sample typing steps. The ID STARlet is specifically designed to be easily adapted to the customer specific lab workflow and for fast implementation. Additionally on site verification is performed by Lifetech professional services to guaranty best kit performance.

Complete set of software methods for ABI forensic DNA kits:

- PrepFiler®
- Quantifiler®/Quantifiler Duo
- Most ABI STR kits

The ID STARlet offers an easy-to-use GUI and user dialogs developed specifically for ABI kits.

easyPunch STARlet

The system enables automated punching and processing of sample cards for genotyping forensic reference/database and/or paternity samples. The easyPunch is a unique system

that integrates sample card handling and punching functionality and liquid handling capabilities into one automated system, thus enabling automation of whole workflows, significantly increasing throughput and process safety. Additionally, the camera based sample detection system analyses the sample (saliva, blood or other fluids) for optimal punch location determination. This allows impartial sample processing avoiding variability or a certain bias. The easyPunch has been developed in collaboration with GE Healthcare Life Sciences.

In addition to the core functionality of handling and punching cards, the liquid handling can be optimized to allow automation of huge variety of protocols from direct PCR on the punch requiring pipetting of master mix and controls to the extraction of small molecules.

AutoLys STAR

The third system provides a fully automated solution for lysis and DNA extraction from dried blood and saliva stains, swabs, paper punches, cigarette butts, hard tissues and other forensic specimens residing on solid surfaces. Major bottlenecks in the DNA isolation process are sample preparation and lysis steps.

These early steps are not only time consuming but also possible sources of human error and cross contamination.

The AutoLys workstation fully automates the entire sample lysis and lysate recovery process. Revolutionary AutoLys channels and AutoLys tubes have been developed to fully automate the lysis process while guaranteeing sample integrity, traceability and DNA yields.

The unique AutoLys tube carries out hands-off preparation of cleared lysates separated from solid material.

About Hamilton Robotics

Hamilton Robotics designs and manufactures fully automated robotic systems for samples preparation and storage. The products range from unique, custom laboratory automation solutions (turnkey solutions) on standard applications validated through partnership programs with renowned biotechnology companies as well as OEM solutions to the top ten diagnostic companies. Hamilton Storage Technologies designs and manufactures cold storage systems for biobanking and other applications. For more information, visit www.hamiltonrobotics.com.