

EVALUATION AND COMPARISON OF ROBOTIC SYSTEMS FOR FORENSIC CASEWORK LABORATORIES

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In forensic casework laboratories nationwide, DNA backlogs have increased, causing proportional demands on the forensic system. In order to meet these demands, robotic platforms are being introduced to the forensic DNA community in ever increasing numbers. Currently, the predominant extraction technique for forensic casework is the phenol: chloroform extraction with the addition of a post extraction filter concentrator. This extraction yields a moderately clean product but generates hazardous waste and must be performed in a properly filtered chemical hood. In contrast, most robotic platforms can be used in an open laboratory setting, while extracting more samples with less manual manipulations. Three robotic platforms were evaluated and compared to the phenol: chloroform extraction: the Qiagen BioRobot EZ1, the Qiagen QIASymphony SP and Promega Maxwell™16.

The evaluation and comparison of these platforms included commonly encountered forensic sample types in addition to more difficult ones such as bones, mixtures, low level sperm samples and trace samples. The samples were quantified in triplicate and then amplified for capillary electrophoresis. The robotic platforms were evaluated for the amount of time saved by an analyst as well as the quality and efficiency of their extractions.