



A116 Comparative Evaluation of Manual Extraction Methods for the Biology/DNA Unit of the Las Vegas Metropolitan Police Department Forensic Laboratory

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After attending this presentation, attendees will understand the strengths and weaknesses of three extraction methods as they apply to desirable forensic outputs, such as high quantitative yields, robust and discriminating STR profiles, and time- and cost-effective methods. The methods evaluated included phenol-chloroform organic extraction, Applied Biosystem's PrepFiler™ Forensic DNA Extraction Kit, and Qiagen's QIAamp® DNA Investigator Kit.

This presentation will impact the forensic science community by alerting casework laboratories to the benefits of alternative commercial extraction kits in the analysis of important forensic samples, including low level types, in order to assist them in making a more informed decision when selecting an extraction method for future work.

An extraction method for forensic DNA casework must produce a high quantitative yield as well as a robust STR profile free from artifacts across all sample types, including low level samples such as touch DNA. The Las Vegas Metropolitan Police Department DNA Laboratory has previously relied on phenol-chloroform organic extraction for forensic casework. In order to expedite the extraction process and foray into automation instruments, a comparison study was undertaken with Applied Biosystems' PrepFiler™ Forensic DNA Extraction Kit and Qiagen's QIAamp® DNA Investigator Kit for the purpose of determining a manual extraction chemistry to replace organic extractions and to be automated in the future.

The kits were evaluated on the basis of: (1) contamination issues;

(2) quantitative yield; (3) STR profile quality; (4) future automation potential; (5) time consumption of the method; and, (6) cost of the method. Based on the results of this study, LVMPD chose to validate the PrepFiler™ Forensic DNA Extraction Kit, citing higher quantitative yields for low level samples and better detection of minor contributors in mixture samples than the other methods, along with STR profile quality comparable to an organic extraction.

DNA, Extraction, Comparison