EXTRACTION OF "CONTACT" DNA SWABS – A MODIFIED APPROACH

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Increasingly, crime laboratories are working "contact" DNA samples wherein an object is swabbed without the previous identification of a body fluid. These samples can be problematic since there is usually limited sample available for testing and the quantity/quality of DNA is unpredictable. It is imperative, therefore, to optimize extraction methods to increase the likelihood of obtaining interpretable DNA typing results.

The United States Army Criminal Investigation Laboratory (USACIL) has robotic DNA extraction protocols in use for known DNA standards and body fluid stain samples using the Qiagen EZI Advanced and Qiagen EZI Advanced XL robotic workstations. However, initial internal validation of these existing robotic extraction protocols for contact DNA samples failed to demonstrate the ability of the automated protocol to yield comparable or improved results when compared to existing validated organic extraction protocols. For this reason, contact DNA samples continued to be extracted per the organic extraction protocols. However, organic DNA extraction is time consuming, requires hazardous organic solvents and requires tedious manual sample manipulation.

To eliminate the need for organic extraction of contact DNA samples, USACIL conducted multiple studies, encompassing over 950 samples over a 12 month period to optimize a robotic extraction method using the Qiagen EZI Advanced and Qiagen EZI Advanced XL robotic workstations.

A modified automated extraction protocol was developed and optimized using dilute buffer ATL and heated MTL buffer utilizing Qiagen EZI Advanced and Qiagen EZI Advanced XL robotic workstations for extraction of contact DNA samples. As a whole, data generated demonstrated the optimized extraction protocol is capable of generating accurate and robust results comparable to results associated with existing organic extraction procedures utilized by USACIL.