

A COMPARATIVE STUDY OF THE DNA IQ™ EXTRACTION PROTOCOLS AND THE ORGANIC EXTRACTION PROTOCOL IN CASEWORK SAMPLES: I

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As DNA testing becomes more prevalent, the demand for speedy and accurate results increases significantly. Finding an extraction protocol which is non-hazardous has also become important to the Forensic community as the sheer volume of samples increases. DNA Isolation and Quantitation™ (DNA IQ™), produced by the Promega Corporation, is a new DNA extraction method that encompasses all of that. This study compared the DNA IQ™ Small Casework Protocol to the organic extraction protocol (phenol:chloroform:isoamyl alcohol), using a variety of casework samples such as whole blood on cloth and clothing, mixed blood on clothing, diluted blood on clothing, saliva swabs and challenged samples such as challenged samples such as blood on leather and blood in soil and mixed with dirt and grease. The quantity of DNA obtained and the subsequent DNA profiles were compared.

The DNA IQ™ Small Casework Protocol extraction uses a magnetic resin to isolate DNA. Twelve samples can be extracted at the same time using the MagneSphere® Technology Magnetic Separation Stand in approximately 2 hours. The protocol is a little more hands-on than the organic extraction protocol, but in return, samples are completely extracted and ready to quantitate in a much shorter time period.

Sufficient amounts of DNA were obtained from the DNA IQ™ system for the saliva samples, whole blood, mixed blood and many of the diluted blood samples for DNA analysis. Complete DNA profiles were obtained from the saliva and whole blood samples. Allelic dropout was observed with mixed blood and diluted blood samples in approximately equal proportions. DNA IQ™ was able to isolate DNA from leather cuttings and swabbings, soil, dirt and grease with much greater success and more complete profiles with less extra work, such as chelex clean up, than the organic extraction protocol. In general, DNA IQ™ has been as successful if not more so than the organic extraction protocol. Since it is a rapid process, more cost effective and is safer to use, it is definitely beneficial to the Forensic DNA community.