



B202 DNA Extraction of Forensic Casework Samples Using the Maxwell™ 16 Robotic Platform

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After attending this presentation, attendees will learn about a new low- to medium-throughput robotic DNA extraction platform and a DNA extraction kit that has been designed specifically for utilization with forensic casework samples.

This presentation will impact the forensic community and/or humanity by demonstrating data directly relevant to the extraction of actual forensic DNA case work samples to those DNA laboratories that have not yet adopted automation but have a desire to learn more about available systems.

Extraction and purification of DNA from forensic casework samples can be time consuming when performed manually. Increasingly, laboratories are looking towards automated robotic platforms to aid in the steps that can be easily performed by a robot, thus increasing overall laboratory efficiency while decreasing the chance of human error. In addition, forensic casework samples are regularly sent to the crime lab in a variety of formats, such as swabs, or pieces of fabric, and may contain a variety of PCR inhibitors that need to be removed prior to short tandem repeat (STR) amplification.

Promega has developed the DNA IQ™ Casework Sample Kit for Maxwell™ 16, which utilizes DNA IQ™ resin in a pre-filled cartridge format. The DNA IQ™ System chemistry has been well established in the forensic community with regards to its ability to produce final DNA extracts that are free of PCR inhibitors, but up until recently has only been used in a manual format or in a high-throughput platform designed to process up to 96 samples at one time. The Maxwell™ 16 instrument is a paramagnetic particle handling robot designed to extract from 1-16 samples at one time with no wasted reagents if the full throughput of the instrument is not utilized, an issue that is common with most high- throughput platforms. The efficient magnetic particle processing of the Maxwell™ 16 instrument avoids other common automation-related issues such as clogged tips or partial reagent transfers that can result in sub-optimal DNA extracts. Methods for extraction of forensic casework samples have been optimized by Promega and are included on the instrument. No additional computer or knowledge of robotics programming is necessary to utilize the system.

The DNA IQ™ Casework Sample Kit has been designed specifically for extraction of DNA from sample types commonly encountered in forensic casework, such as blood stains, touch or trace DNA samples, and tissue. In addition, the system concentrates the final DNA extract in to a volume that is optimal for forensic casework. The authors will provide data regarding extraction of these and other sample types, including comparisons of DNA yields obtained from the Maxwell™ 16 System vs. other robotic platforms. Demonstration of the viability of the final DNA extracts for downstream STR typing applications, and customer testing of non-probative casework samples will also be presented.

DNA Extraction, Maxwell 16™, Forensic Casework DNA Samples