INCORPORATING AN AUTOMATED DIFFERENTIAL WASH PROCEDURE ENHANCES LAB EFFICIENCY

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Automation may be used to replace repetitive, tedious and error-prone tasks that do not require significant intellectual input by a trained forensic analyst, such as DNA extraction and basic liquid handling. Employing reliable and efficient automation when possible allows an analyst more time for activities such as screening evidence, selecting appropriate samples, interpreting data, and preparing reports. Differential separation of sperm and epithelial fractions remains a process that has proven difficult to automate while maintaining the required quality.

Despite being one of the more laborious tasks in a forensic casework lab, manually washing sperm pellets continues to be the "gold standard" method to obtain effective differential separation. QIAGEN's QIAcube platform provides a low-to medium throughput procedure for washing sperm pellets by automating centrifugation and pipetting, to deliver reliable and reproducible results regardless of the operator. TheQIAcube automated differential wash procedure enables more efficient workflow by incorporating more hands-free analyst time.

Any new method proposed to the forensic community should demonstrate comparable or better performance (reliability and quality) to former manual methods and demonstrate a clear benefit to workflow efficiency. For example, automating sperm pellet washes may allow time for extraction or STR data interpretation of other samples while automated washes are being performed. Multiple analysts of a wide range of experience performed differential extractions which were compared to the automated method using Promega's PowerPlex® 16 System to compare the final product of the two approaches. The resulting data demonstrated (1) performance in terms of sensitivity and reproducibility; (2) absence of contamination; (3) benefits of incorporating automated differential washes in casework; and (4) the benefits of processing sexual assault cases in batches.