

VALIDATION OF THE PROMEGA DNA IQ™ SYSTEM FOR CASEWORK SAMPLES

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We have validated the Promega DNA IQ™ magnetic beads system for forensic casework samples. Changes were made to the Promega Tissue and Hair Extraction Kit Protocol in order to maximise DNA yield from forensic samples. These changes included increasing the incubation time with the magnetic beads to one hour, and also doubling the amount of beads with certain samples types containing low amounts of DNA such as handled objects. One hundred and twenty mock samples (chewing gums, blood on dark fabric, drinking cans, cigarette butts, envelope flaps, etc) and 31 authentic casework samples (blood on a variety of substrates, shed cells on clothing, etc) were analyzed in the validation, for a total of 151 forensic samples. After proteinase K lysis and filtration, each lysate was separated in three parts: one part for the organic extraction, one part for the DNA IQ extraction, and a third part was frozen and saved for later use (automation of the manual DNA IQ protocol). This design allowed a direct comparison between the organic extraction and the magnetic beads extraction for both DNA yield and quality. For each sample, DNA yield and quality were analyzed by QPCR and also by STR amplification using ProfilerPlus® and Cofiler® systems. Results show similar DNA yields for the DNA IQ system compared to the organic extraction in unsaturated conditions, and satisfactory yields in saturated conditions. Similar quality of STR profiles were obtained for all samples types with the DNA IQ system compared to the organic extraction. Importantly, the quality of DNA obtained from difficult samples was better with the DNA IQ system than with the organic extraction, both for QPCR and STR amplification.