

USE OF THE INVITROGEN CST® FORENSIC DNA PURIFICATION KIT

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In the context of automation of forensic DNA sample extraction procedures, the use of a magnetic bead system is advantageous. Tests with the Invitrogen CST® system were performed in comparison with phenol/chloroform DNA extraction and the Promega DNA IQTM kit. The principle of the CST® system is based on DNA's affinity for positively charged magnetic beads. This system offers certain advantages (use of aqueous solutions, elution at room temperature), but since the required elution volume is large, the resulting DNA is very diluted. Changes were made to the CST® protocol in order to maximize DNA yield from dried blood samples at the highest concentration possible. These changes included a decrease in magnetic bead volume and elution volume as well as an additional elution step. The results obtained for blood samples dried on paper were similar to those obtained by phenol/chloroform extraction and DNA IQTM for DNA yield, concentration and quality. The data also show that the CST® system exhibits very good affinity for DNA, because it allows satisfactory DNA yield following a one-minute incubation step with the magnetic beads. To further evaluate DNA quality for amplification (Real-Time PCR quantification and Profiler Plus® STR amplification), tests were carried out with known forensic refractory samples (cigarette butts, dried blood on dark fabrics, cans and envelope flaps). For these samples, DNA purified using the CST® kit exhibited a higher inhibition rate for RT-PCR quantification and STR amplification compared to the DNA obtained with DNA IQTM, potentially due to the presence of inhibitors (e.g.: color eluted from dark fabrics). The CST® system is thus adequate for blood sample databanking purposes but provides DNA of poorer quality for frequently encountered forensic samples.