DNA Extraction by Spin Columns from Whole Blood, Blood Stain and Buccal Cells

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Spin Column DNA extraction claims to be an efficient technology with improved DNA yield and purity. In this study we assessed spin columns for the extraction of DNA obtained from three different sources and stored for different lengths of time and at various temperatures, for use in human identification analysis.

QIAamp blood kit (QIAGEN) and High Pure PCR template Preparation kit (Boehringer Mannheim) were initially compared with our in-house salting out method by extracting DNA from anticoagulated blood. QIAamp blood kit was further assessed for extraction of DNA from either anticoagulated blood, dried blood stains on filter paper or Buccal cells. DNA extractions were performed on the day of collection, and again on days 7, 30 and 60 after collection. Replicate samples were kept at room temperature, 4°C and -20°C (for dried blood stains only) for the times indicated above.

Yield and purity of the DNA was determined by optical density measurements on GeneQuant II (Pharmacia Biotech). Quality of the DNA for PCR amplification was assessed by amplifying different STR loci.

The QIAamp kit produced similar DNA yield to the salting-out procedure whilst High Pure kit had a much reduced yield (an average of 20µg/ml for both QIAamp and salting-out methods and 8µg/ml for High Pure). Purity of DNA obtained from all three procedures had similar OD260/OD280 ratios, (1.6-1.8). DNA extracted by QIAamp columns amplified more successfully than those extracted by High Pure kit, but similar to those obtained by the salting-out method. DNA extracted by QIAamp successfully amplified and gave specific, reliable and reproducible PCR results.

Cost analysis showed that the use of QIAamp kit was cost effective when up to 18 samples were extracted at a time. Therefore, the ease of use, cost effectiveness and high yield and purity of DNA obtained by QIAamp kit make it the extraction kit of choice.