DNA IQ™: The Intelligent Way to Purify DNA

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Promega's DNA IQ™ System[a] is the first DNA purification system designed specifically with the forensic and paternity communities in mind. The current technique of phenol/chloroform extraction is time consuming, uses toxic organic solutions and does not always remove PCR inhibitors. Chelex® extraction is less time consuming, but does a poor job of removing organic-based inhibitors. The DNA IQ™ System was designed to overcome the problems of these systems while taking advantage of and meeting the two diverse needs of the forensic community: databasing and casework. The system is designed around a magnetic particle capture technique for small sample sizes. It is rapid, contains a simple stain extraction and purification protocol for most sample types, effectively removes PCR inhibitors, is environmentally friendly and can be automated. The DNA IQ™ System has been optimized for use with the AluQuant™ Human DNA Quantitation System[a] and the PowerPlex® Systems[b,c].

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DATABASE DEVELOPMENT: PROVIDES CONSISTENT QUANTITIES OF DNA

The main goal of analyzing database samples is to obtain reliable profiles of single source samples in a rapid and cost-effective manner. The DNA IQ™ System meets this goal by allowing the integration of DNA isolation and quantitation. Saturation of the DNA IQ™ Resin with DNA leads to consistent isolation of DNA from various samples (Figure 1). The system is designed to isolate 100ng of DNA. Biological materials on stain cards (FTA® or S&S 903 paper) or swabs can be extracted by a single centrifugation step, while liquid materials can be handled without centrifugation.

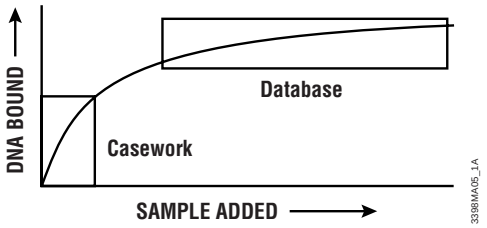

Figure 1. A constant amount of DNA can be purified from database samples of various sizes including blood, buccal swabs or stains on FTA® paper (Database box). DNA can also be effectively purified from casework samples of various types (Casework box).

FORENSIC CASEWORK: HANDLES CHALLENGING SAMPLES

A focus in casework is to isolate DNA away from contaminants and impurities, which can affect the PCR process. The DNA IQ™ Resin binds DNA and allows removal of inhibitors and impurities in solution. The system is designed to increase in efficiency as the sample size decreases, therefore, it is effective with samples containing minimal starting material (Figure 1). This allows for consistent and successful isolation of DNA from forensic samples. The DNA IQ™ System has been successfully applied to blood on a number of substrates, including cotton, denim, soil and leather. Isolations from complicated materials, such as hair roots and 10-year-old bone samples, have also been successful. A procedure for the purification of DNA from male and female fractions following differential extraction of semen stains is being investigated.

FOR MORE INFORMATION

Please visit **www.promega.com/geneticidentity** for more information. Subsequent articles will explore the capabilities of the new DNA IQ™ System in more detail.

[a]Patent Pending.

[b,c]Refer to the patent and disclaimer statements on page 2.

The DNA IQ™ System.