



Criminalistics Section – 2009

A126 Evaluation and Validation of Purification Columns for Forensic DNA

*Marissa R.D. Meininger**, 10492C Dougherty Avenue, Morgan Hill, CA 95037; *Brooke Barloewen, MD*, Santa Clara County Crime Lab, 1557 Berger Drive, San Jose, CA 95112; *Jocelyn W. Jones, MFS*, 4176 26th Street, San Francisco, CA 94131-1915; and *Steven B. Lee, PhD*, San Jose State University, 1 Washington Square, Macquarrie Hall 521, San Jose, CA 95192

The goal of this presentation is to evaluate four purification columns for forensic DNA analysis.

This presentation will impact the forensic science community by allowing them to evaluate multiple DNA purification columns for the replacement of the Millipore Centricon columns.

A crucial aspect in the field of forensic science is the ability to concentrate and purify extracted DNA. Millipore Centricon concentrators are popular due to their efficiency and ease of use. Unfortunately they are no longer being produced so an alternative must be evaluated.

In this experiment four columns were evaluated: Millipore Microcon, Sartorius-Stedim Vivacon-2, Pall Microsep and Millipore Microcon. The columns were evaluated based on the quality and quantity of DNA collected and ease of use. It is hypothesized that one of the concentrators will perform equally or better than the Centricon columns. A variety of biological samples were chosen to represent those encountered in forensic casework. Samples were extracted using a phase separation extraction method and concentrated with the columns in parallel. Samples were then quantified using real-time quantitative PCR (Quantifiler, ABI 7500, Applied Biosystems) and amplified using Identifiler (Applied Biosystems) STR multiplex. The amplicons were detected using a genetic analyzer (ABI 310).

This experiment determined that the overall performance of the four columns tested were all good and very similar. Based on ease of use and performance the Vivacon-2 was the most easily manipulated. The Vivacon-2 column was found to retain the highest amount of DNA from the majority of samples tested. Further experiments will be conducted to test the reproducibility of results for each column. Results of the evaluations of all four columns will be presented. Funding for this project was provided by NSF-REU.

DNA Purification, Concentrator Column, DNA Extraction