

STRATEGIES FOR INCREASING ALLELE CALLS IN FORENSIC CASEWORK USING PCR ENHANCEMENTS AND COMMERCIAL POST AMPLIFICATION CLEAN UP SYSTEMS

Scott C. Milne, B.S., Kathleen A. Mayntz-Press, M.S.F.S.

Arizona Department of Public Safety, DNA/Serology Casework Unit, Phoenix, AZ

The ability to ascertain a minor component in admixtures or elucidate a profile from a degraded sample has always presented a challenge in forensic casework. Furthermore, there has been an increase in forensic DNA casework samples submitted that include degraded and trace samples which require greater analytical sensitivity. The ability to increase sensitivity with the least amount of manipulation to the sample is ideal when working with these types of samples.

Two post amplification clean up systems were evaluated: Qiagen's Minelute[®] PCR Purification Kit and Promega's Wizard[®] SV Gel and PCR Clean-Up System.

In addition one PCR enhancement reagent was evaluated: BioMatrica[®]'s PCRboost[™]. This reagent increases PCR performance, thus improving sensitivity and specificity.

In an attempt to demonstrate the diversity of the products, we examined bone samples, trace samples, serial dilutions and mock case mixtures. Using these post amplification clean up systems significant increases in detectable alleles have been noticed. Additionally, an increase in the relative fluorescent units and a lower signal to noise ratio were observed. Use of these post amplification clean up columns improves overall sensitivity and increases the probability of achieving probative results.