

Extraction of DNA from Forensic Biological Samples for Genotyping

REFERENCE: Stray JE, Liu JY, Brevnov MG, Shewale JG: Extraction of DNA from forensic biological samples for genotyping; *Forensic Sci Rev* 22:159; 2010.

ABSTRACT: Biological forensic samples constitute evidence with probative organic matter. Evidence believed to contain DNA is typically processed for extraction and purification of its nucleic acid content. Forensic DNA samples are composed of two things, a tissue and the substrate it resides on. Compositionally, a sample may contain almost anything and for each, the type, integrity, and content of both tissue and substrate will vary, as will the contaminant levels. This fact makes the success of extraction one of the most unpredictable steps in genotypic analysis. The development of robust genotyping systems and analysis platforms for short tandem repeat (STR) and mitochondrial DNA sequencing and the acceptance of results generated by these methods in the court system, resulted in a high demand for DNA testing. The increasing variety of sample submissions created a need to isolate DNA from forensic samples that may be compromised or contain low levels of biological material. In the past decade, several robust chemistries and isolation methods have been developed to safely and reliably recover DNA from a wide array of sample types in high yield and free of PCR inhibitors. In addition, high-throughput automated workflows have been developed to meet the demand for processing increasing numbers of samples. This review summarizes a number of the most widely adopted methods and the best practices for DNA isolation from forensic biological samples, including manual, semiautomated, and fully automated platforms.

KEY WORDS: DNA extraction, DNA isolation, DNA purification, DNA typing, genotyping, human identification, STR profiling.
