

## **GenCode : A Permanent Sample Identification System in Forensic Applications**

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### **Abstract**

In forensic applications, permanent identification of a DNA sample is crucial to maintain chain of custody. Typical barcode labeling or hand written identification on frozen blood or microcentrifuge tubes frequently fails. In contrast, GenCode incorporates a unique biological bar code that is associated with each FTA element within the 384 well GenPlate. This barcode permanently and uniquely identifies the plate and the associated biological sample throughout all processes, even in solution. This identification feature provides a complete chain of traceability for each sample irrespective of physical state, reducing human error and the risk of legal challenges.

Specifically, GenCode is a unique combination of DNA sequences embedded into each FTA element within the GenPlate. GenCode is visualized using standard gel electrophoresis or the eGene Genetic Analyzer (HAD-GT12). An identification pattern is developed when the GenCode is separated by size and sequence. GenCode's identification pattern is based on a 5 x 5 matrix, where double stranded DNA sequences are used to resolve 25 DNA sequence combinations. This 5 x 5 matrix has the ability to provide a unique code for over 33 million samples. GenCode can easily be expanded to generate more unique identification codes. For example, the addition of one lane (or set for the eGene) of 5 DNA sequences to resolve a total of 30 DNA sequences would generate over one billion codes. GenCode does not affect the bactericidal and virucidal properties of the elements and does not have any effect on downstream applications.