

## **INVESTIGATIONS ON THE USE OF SAMPLEMATRIX™ TO CAPTURE AND STABILIZE CRIME SCENE BIOLOGICAL SAMPLES FOR OPTIMIZED ANALYSIS AND ROOM TEMPERATURE STORAGE**

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The successful resolution of crime scene investigations often depends on the ability to identify and individualize biological evidence. Fundamental to this analysis is the stabilization of biological evidence, because testing generally does not proceed immediately after collection. Crime scene samples and liquid extract derivatives are routinely stored frozen in forensic laboratories, to be thawed at the time of analysis. However, numerous lines of evidence indicate that the process of freezing and thawing has detrimental effects on biological samples. Many crime scene samples are sub-optimal for analysis—the further degradation of the samples by current storage systems only exasperates the difficulty of identifying and individualizing biological evidence.

Biomatrix, Inc. has developed a proprietary platform technology for the dry storage of biological materials at ambient temperatures. The key component of this technology is SampleMatrix™, which was derived from studies on extremophile organisms. These organisms can survive extreme environmental conditions. SampleMatrix™ consists of protective agents developed from combining small molecule chemistry with advanced polymer chemistry. This product has multiple components: 1) the dissolvable polymer in a stabilization buffer adjusted for the different biological samples; 2) a stabilizing solution containing small synthetic molecules.

We have conducted research on the effectiveness of SampleMatrix™ to stabilize biological evidence as compared to conventional storage methods. The study tests the hypothesis that the storage of biological samples, swabs and liquid DNA extracts, in the SampleMatrix™ polymer at room temperature reduces the exogenous degradation of DNA by minimizing the adverse effects of hydrolysis and freeze-thawing. Blood, semen, and saliva stains of different concentrations were initially deposited on five different substrates. Each stain was sampled by swabbing with water or SampleMatrix™ as the wetting agent and then exposed to room temperature v. freezer storage for longitudinal study. In addition, we have conducted parallel studies whereby blood, semen, and saliva (of comparable concentrations to the substrate study described above) were directly applied to swabs and subsequently stored for longitudinal study.

This presentation will discuss the results of the experimental conditions that were evaluated by Real-Time and STR analysis following standard forensic protocols.