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OPTIMIZING DNA STABILIZATION AND STORAGE OF FORENSIC DNA SAMPLES USING POLYMERS

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DNA sample storage is of paramount importance in forensic, epidemiological, clinical and genetic laboratories. In forensic DNA laboratories there is always the possibility that cases may be re-opened and any stored DNA sample may need to be re-tested. This is especially important when the amount of DNA is limited. Forensic evidence samples such as hairs, bones, teeth and sexual assault evidence may contain less than 100 pg of DNA. In addition to sample quantity, degradation, exposure to UV, storage buffers and temperature of storage may lead to differences in the ability to recover and re-test the sample. Utilization of the most efficient storage method is critical in the ability to re-test samples. Low yields or loss of DNA may even preclude or diminish the ability to test crime scene samples using current STR methods. Therefore less discriminating but more successful mtDNA testing is typically dictated in samples with advanced states of degradation and low DNA quantity. In either case, the optimal storage of DNA extracts is pivotal for downstream analysis. Biomatrica, Inc. has developed a technology for the stable, dry storage of biological materials at ambient temperatures. SampleMatrix® (SM), was derived from studies on extremophile organisms, some of which may be reduced to anhydrous conditions, a state known as anhydrobiosis. SM may protect DNA by forming a protective sheath around DNA, forming a barrier to degradation and loss. An interlaboratory consortium of academic, government and biotechnology organizations has been formed to evaluate the protective effects of SM on forensic DNA samples. Results with qPCR and amplification of amplicons of varying size ranges on control DNA and low quantity and low quality DNA samples at varying concentrations following storage at different temperatures with and without SM will be presented. DNA samples stored in SM have been found to be stable for over 2 years without degradation or loss of integrity.