A52 Comparison of Room Temperature Forensic DNA Extract Sample Preservation Methods

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After attending this presentation, attendees will be informed of room temperature DNA sample preservation methods.

This presentation will impact the forensic science community by informing the community about the potential of room temperature sample preservation of DNA extracts.

In most cases, only a portion of the entire DNA extract volume is consumed during forensic analysis. Once extracted, the remaining DNA is typically stored in a refrigerator at 4ºC, a freezer at -20ºC or at -70ºC for long-term storage to avoid sample degradation. While these are acceptable DNA storage methods, use of refrigerators and freezers may be viewed as costly when factoring in the individual cost to purchase and maintain as well as energy and space requirements. The potential loss or degradation of evidentiary samples when such systems fail must also be taken into consideration as well as when refrigeration and/or freezers are not readily available. For these reasons, alternative room temperature biological evidence storage systems and methods are of interest to most forensic DNA units.

Historically, forensic DNA has been stored dry and/or cold since these conditions reduce the rate of bacterial growth or degradation by DNases. This study evaluated three room temperature storage techniques

which included; Whatman® Micro FTA cards, QIAsafe™ DNA Tubes, and sterile swabs. Swab samples were dried using the SafeSwab™ swab dryer, and a contamination study was conducted to ensure that the drying process would not cause cross contamination.

Sample types tested included liquid blood, dried trace blood, hair, buccal swabs, sweat/wearer, mock sexual assault, and touch DNA. All samples were extracted with Promega's DNA IQ™ system on the BIOMEK® 3000 Laboratory Automation Workstation, quantified with Applied Biosystems Quantifiler Duo® Quantification Kit on Applied Biosystems 7500 Sequence Detection System, and amplified using Promega's multiplex STR PowerPlex® 16 system and capillary electrophoresis run on ABI Prism® 3130*xl* Genetic Analyzer. Raw data from the 3130*xl* was analyzed using Genemapper® ID v3.2.1. To test the efficiency of each storage technique, samples were eluted in TE buffer and recovered at two weeks, six weeks, and finally six months. Each method was evaluated according to its ability to provide the highest recovery of DNA, as well as to provide a quality profile as compared to the initial quant value and profile obtained from the sample. **Preservation, Storage, DNA**

 ** Presenting Author*