A94 DNA From Self - Adhesive Postage Stamps: A Comparison of Four Extraction Methods

Bonnie S. Stransky, BA, University of Alabama at Birmingham, 4805 Tree Crossings Parkway, Hoover, AL 35244*

After attending this presentation, attendees will become familiar with four methods for extracting DNA from self - adhesive postage stamps.

This presentation will impact the forensic science community by providing an additional source of DNA that can be collected and used as evidence. The best method for the collection and extraction of DNA from self - adhesive stamps will be described. This research will augment current collection techniques.

Previous works by other researchers have demonstrated DNA profiles can be recovered from saliva residue and transferred buccal cells found on postage stamps and envelope flaps. Due to storage and application convenience, self-adhesive stamps have gradually replaced traditional moisture-activated stamps in the United States. With improving techniques for Low Copy Number (LCN) DNA recovery and amplification, it may be possible to recover full Short Tandem Repeat (STR) loci profiles from epithelial cells deposited on self-adhesive stamps.

The transfer of epithelial cells from an individual to the sticky surface of a self-adhesive stamp provides the opportunity to recover and isolate DNA from self adhesive stamps as a way of identifying the stamp's applier. The extracted DNA must be of a sufficient quantity and quality to allow forensic biologists to amplify STRs, using a commercial kit, producing a full genetic profile. The presence of the stamp's adhesive creates a unique environment as the potential for inhibition from the adhesive must be taken into account. The best method for extracting DNA from self-adhesive stamps is unclear.

Four extraction methods were employed to extract DNA from self- adhesive stamps applied to envelopes by volunteers. Following the application of the stamp to an envelope, the stamps were first cleaned, then removed by peeling the stamp from the envelope. The entire stamp was cut to fit inside a 1.5ml microcentrifuge tube. DNA was extracted from the self-adhesive stamps using one of four methods, an organic extraction with microconcentrators chelex beads, Qiagen's DNeasy Blood and Tissue kit, and Promega's magnetic resin bead DNA IQ kit. Extractions were quantitated and inhibition was evaluated using Appied Biosystems' Quantifiler™ Human Quantification Kit. STR loci will be amplified using Applied Biosystems' AmpfℓSTR® Identifiler® Kit and analyzed using an Applied Biosystems 310 Genetic Analyzer. The profiles generated will be compared to that of reference buccal samples from the volunteers. The extraction method producing the most accurate and robust profiles will be considered the best method. By cleaning the stamps before extraction, an attempt will be made to demonstrate that DNA from the stamp's "user" can be recovered and amplified without amplification of external (postal personnel) DNA.

Initial results indicate DNA can be recovered from the backs of self- adhesive stamps using three of the extraction methods mentioned above. The quantity of DNA should be sufficient to allow for amplification and analysis of STR loci. Conclusions of which extraction method better recovers DNA from self-adhesive stamps cannot be made at this time.

STR Analysis, Self - Adhesive Stamps, DNA Extraction

 ** Presenting Author*