A56 The Effect of a Latent Print Processing Technique on the Recovery of DNA From Duct Tape

Michael J. Kennedy, BS, Paul Verdino, MS, and Lynn Van Camp, MS, New Jersey State Police Office of Forensic Sciences, 1200 Negron Drive, Hamilton, NJ 08691; and Christina Ruddick, York College of Pennsylvania, Richland Hall #404, York, PA 17405*

The goal of this presentation is to educate attendees on the ability to separate duct tape with liquid nitrogen, process the tape for latent prints, and still recover evidential DNA.

This presentation will impact the forensic community by demonstrating the effective recovery of DNA from chemically treated duct tape evidence.

The purpose of this study was to determine if a separation and latent print processing technique would adversely affect the recovery of DNA from duct tape.

Latent prints and DNA are two critical pieces of evidence recovered from duct tape. Finding both latent prints and DNA on duct tape would be powerful evidence in linking a suspect to a scene or victim. Performing latent print processing using a wet suspension of fingerprint powder on duct tape prior to DNA sampling could potentially destroy DNA. This study concentrated on a single separation and latent print processing technique and whether DNA profiles are still obtainable post- processing.

A single roll of commercially available duct tape was used for all samples in this study. Three test subjects were chosen to handle the duct tape in order to deposit both latent prints and DNA. For the first test, both the backing and adhesive sides of the tape were handled. For the second test, only the adhesive side of the tape was handled and for the third test, the duct tape was simply grasped and torn. The tape was then cut into three sections for treatment. One sample was an untreated control, the second was for separation, and the third was for latent print processing.

The separation process uses liquid nitrogen in order to facilitate the removal of duct tape from itself, as well as other objects. Previous work has shown that liquid nitrogen facilitates the separation of duct tape and will not alter latent prints. Using liquid nitrogen on duct tape momentarily deactivates the adhesive and allows separation without excessive pulling and stretching of the tape. Any stretching could potentially distort any latent prints present.

Developing the latent prints was the second part of the analysis. There are numerous latent print processing techniques, some of which are used primarily for adhesives. The technique used for this study is a commercially available fingerprint powder suspended in a liquid surfactant. This suspension was brushed onto both the backing and adhesive sides of the duct tape and then rinsed with deionized water. After rinsing with water, the remaining powder adheres to any latent prints left behind. Once samples were treated with liquid nitrogen or processed for latent prints, they were packaged and sent for DNA analysis.

DNA analysis of the duct tape consisted of an extraction procedure involving the addition of Proteinase K, followed by a clean-up and concentration procedure. Real-time PCR was used for quantitation, followed by amplification consisting of 28 cycles, and detection using a genetic analyzer.

The DNA results obtained from the tape samples were compared to each of the test subjects' DNA profiles. A positive human quantitation result was obtained from all samples. Variation in the number of loci detected was observed in the control samples as well as samples processed with liquid nitrogen or fingerprint powder.

DNA, Duct Tape, Latent Print Processing

 ** Presenting Author*