B140 Working to Solve Compatibility Issues Between Impression Enhancement and DNA Analysis

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After attending this presentation, attendees will be provided with research that explores the need for collaborative efforts to maximize evidence potential in order to provide both impression details and DNA profiles for evidence samples deposited in biological fluids. Highlighted in this presentation are the data generated during National Institute of Justice (NIJ) -funded research that uses Zar-Pro™ fluorescent blood lifting strips for enhancement and preservation along with common DNA extraction techniques to generate DNA profiles from impression evidence that has been lifted.

This presentation will impact the forensic science community by showing how DNA is preserved and can be retrieved from impression evidence lifted and enhanced using Zar-Pro™ fluorescent blood lifting strips, thus simplifying collection and preservation while expanding the utility of impression enhancement methods including DNA analysis, which could have the potential to change the way technicians approach crime scene evidence.

Impression evidence, deposited in both blood and non-blood biological fluids, is a common component at many crime scenes. Current fluorogenic enhancement methods for impression evidence can be problematic for DNA preservation and are often impractical for crime scene use due to their toxicity. This may result in a situation in which a crime scene technician must make a decision during evidence collection either to enhance the impression (potentially damaging the DNA evidence) or to gather the DNA evidence (possibly destroying the impression evidence). Zar-Pro™ fluorescent blood lifting strips have been successful in lifting, enhancing, and preserving bloody impression evidence. They provide a highly sensitive method for processing and fluorogenically enhancing bloody impression evidence that can be preserved and utilized over long time intervals; however, the viability of subsequent DNA analyses has not been established.

This research explores the need for collaborative efforts to maximize evidence potential in order to provide both impression details and DNA profiles for evidence samples deposited in biological fluids. Highlighted in this presentation are the data generated during NIJ-funded research that uses Zar-Pro™ fluorescent blood lifting strips for enhancement and preservation along with common DNA extraction techniques to generate DNA profiles from impression evidence that has been lifted. During the initial phase of the project, more than 1,200 impressions were made in five biological fluids on a series of seven substrates that range from non-porous to semi-porous to porous. In order to determine the viability of the DNA over time when fixed to the Zar-Pro™ fluorescent blood lifting strips, trials were established to test one-month, three-month, six-month, and twelve-month intervals. The goal of this project was to test the viability of DNA in evidence processed with Zar-Pro™ fluorescent blood lifting strips and to develop and optimize a DNA extraction protocol in an effort to develop a simple, time- and cost-effective, non-toxic method that is safe for use at crime scenes and provides opportunities for subsequent DNA recovery suitable for use in forensic science laboratories. Preliminary results are encouraging and indicate that DNA is sufficiently preserved and can be retrieved from impression evidence lifted and enhanced using Zar-Pro™ fluorescent blood lifting strips. Research is ongoing; however, the data generated suggest that simplifying collection and preservation while expanding the utility of impression enhancement methods to include DNA analysis could change the way technicians approach crime scene evidence.

Impression Enhancement, DNA Preservation, DNA Analysis

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