



B26 Investigative Studies Into the Recovery of DNA From Improvised Explosive Device Containers

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After attending this presentation, attendees will become familiar with obtaining DNA profiles from recovered IED containers (e.g., backpacks) and how this information can aid in identifying the person(s) responsible. Attendees will also learn how this approach can be more beneficial than trying to recover DNA profiles from the detonated IED itself.

This presentation will impact the forensic community by introducing a new approach to investigate cases involving IEDs, while at the same time contributing to many evolving topics in forensic science including low copy number/touch DNA, degraded DNA, PCR inhibition, and miniSTRs.

Improvised explosive devices (IEDs) have become the weapon of choice for military and terrorist attacks nationally and world-wide. Events such as the Centennial Olympic Park bombing in 1996, the London bombings of 2005, and the ongoing conflict in Iraq demonstrate the destructive and psychological capabilities of IEDs. Their ease of assembly and delivery, as well as the ability to readily conceal them, are important factors in their increased use.

IEDs are often transported and delivered in a container (e.g., a bag, backpack, or briefcase), which serves as a method of concealment. It is likely that any such container has undergone extensive, direct contact with the person responsible for the device, making DNA analysis plausible. Past research has shown that mtDNA profiles,^[1] as well as a limited number of STR results,^[2] can be obtained from a detonated IED. Although such data are valuable, they do not lead to absolute identification however. Analysis of DNA from IED containers has the potential to produce more discriminatory results (increased number of STR loci) for two reasons. First, the DNA on the container may not be as degraded as the DNA on the actual IED. Second, around 90% of the nonexplosive components of an IED survive the explosion,^[3] thus pieces of the container are more likely to be collected, providing more sample to work with.

For the research presented, study participants were asked to carry a backpack for 1 – 2 weeks in a manner resembling everyday use. An IED was then placed in the backpack and detonated under the control of the Michigan State Police Bomb Squad. Pieces of the container were collected, and areas of likely contact (zippers, handles, straps) were individually swabbed to recover shed cells. Organic extractions were performed, followed by STR analysis. Results of these experiments will be presented.

References:

- ¹ Gehring, Michael. The Recovery and Analysis of Mitochondrial DNA from Exploded Pipe Bombs. Master's Thesis, Michigan State University, 2004.
- ² Esslinger, K.J., Siegel, J.A., Spillane, H., Stallworth, S. (2004) Using STR Analysis to Detect Human DNA from Exploded Pipe Bomb Devices, *J. Forensic Sci.*, 49(3):481-484.
- ³ Thurman, James. Practical Bomb Scene Investigation. London: CRC Press, 2006.

DNA, Improvised Explosive Device, Short Tandem Repeat