B32 Gunshot Residue on Evidence Packaging

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After attending this presentation, attendees will better understand a source of Gunshot Residue (GSR) contamination and methods to minimize GSR contamination prior to analysis.

This presentation will impact the forensic science community by raising the awareness of law enforcement personnel, evidence technicians, and analysts to GSR packaging contamination so that personnel handling GSR-evidence packaging can take steps to prevent it from affecting GSR analyses.

GSR analysis is a valuable tool commonly used in forensic science to associate a suspect with the discharge of a firearm. Associations may result from firing a weapon, being in close proximity to a discharge, handling a weapon or fired cartridge, or handling some other surface bearing GSR. The presence of GSR particles does not prove that a person fired a weapon, but in a criminal investigation it can place an individual in the proximity of the firing of a weapon. As few as three GSR particles are sufficient to provide an association.

GSR particles can contaminate a surface by unintended transfer during collection. Since areas frequented by law enforcement personnel are known to contain GSR, effective efforts must be made throughout the evidence collection process to reduce the possibility of contamination. Proper hygiene and the use of Personal Protective Equipment (PPE) can help prevent contamination. Precautionary practices such as control sampling of a collector's hands before evidence collection can demonstrate the absence of GSR particles that could be a source of contamination.

In order to evaluate the potential for packaging to be a source of GSR contamination, the exterior of 100 GSR collection kit packages of varying types was sampled for GSR. Samples were blindly tested using Scanning Electron Microscopy/Energy Dispersive X-ray Spectroscopy (SEM/EDX) with automated software to detect particles characteristic of GSR by standard operating procedures.

Results showed that 12 of the 100 sampled packages yielded characteristic GSR particles. Of the twelve positive exteriors, three had more than one particle. The source of the GSR could not be determined but the packages were purchased by and in the control of the law enforcement agency prior to submission.

These results show that GSR evidence packaging should be treated as if it were contaminated. The laboratory should maintain separate package handling and analytical testing areas. Good practices should include wiping GSR packaging at evidence intake, regular cleaning of dedicated laboratory packaging area and analytical areas, and the use of PPG and good hygiene practices.

In conclusion, this presentation will illustrate a potential source of GSR laboratory contamination and will provide suggested actions that may be taken to mitigate its occurrence.

GSR, SEM, Contamination