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Research Abstract

Development of a Metal Ion Extraction Protocol for GSR in Blood Matrices

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Abstract:

Derived from multiple different professionals expressing a lack of protocol and a lack of research in the field, the main purpose of this study is to extract GSR particles from blood matrices. Through the modification of metal ion extractions, gun-shot residue particles (GSR) will be extracted and analyzed for direct comparison by the scanning electron microscope (SEM). The extraction of GSR from blood is compared on both the outer hand, palm of the hand, and forearm. Samples were obtained by placing whole blood on the hands of a shooter and sampling after a shot had taken place. This process was repeated until all areas had been sampled and there were enough samples to process. The areas sampled were then compared against controls obtained from whole blood stocks and NIST standards. Controls made from a known amount of a NIST standard placed in whole blood. NIST standards are comprised of varying amounts of lead, antimony, and barium, comparable to those in a standard GSR sample. Using the SEM to determine if GSR samples are present, metal ions are extracted without damaging the integrity of the hemoglobin in blood. This extraction technique broadens the scope of collectable GSR samples at a crime scene. Optimization of a metal ion extraction protocol allows for GSR particles to be compared to known samples for further identification.