

HANNAH NELSON and MARK FLOOD, Forensic Science Program, Fairmont State University, Fairmont, WV 26554. Comparison of commercial touch DNA extraction systems utilizing the polymerase chain reaction technique.

Forensic scientists often generate genetic profiles from old blood stains, seminal stains, and hair, but an individual's genetic profile has been accomplished from surfaces touched by human hands. This "Touch DNA" potentially allows for the sensitive identification of DNA from crime scenes where fingerprints are found. The experiment was designed to determine the sensitivity of DNA isolation from fingerprints placed on glass. The two kits used in this experiment were the Invitrogen ChargeSwitch® Forensic DNA Purification Kit and the Promega DNA IQ™ Kit. The kits provided protocols that claimed to facilitate isolation of genomic DNA from fingerprints. After touching cleaned glassware with varying numbers of fingerprints, DNA isolation was performed using each of the above listed kits. A sterile swab was moistened with sterile water and used to extract deposited material from the glassware. Isolated DNA was amplified with the highly sensitive polymerase chain reaction (PCR) technique and separated by gel electrophoresis. A NanoDrop One was used to obtain DNA concentrations for all touch DNA samples and dilutions. The two kits successfully isolated sufficient DNA from cheek swabs and dilutions, and the Promega DNA IQ™ system was found to be more sensitive to DNA contamination. However, the two commercial kits did not successfully extract a sufficient quantity of Touch DNA from a non-porous surface coated with fingerprints. Future experiments should be performed using Touch DNA samples on different surfaces to determine if DNA isolation efficiency can be improved. The project was supported by the NASA West Virginia Space Grant Consortium.