microFLOQ®: COLLECTION AND DIRECT AMPLIFICATION METHODS USING THE GLOBALFILER™ KIT FOR DNA RECOVERED FROM COMMON PIPE BOMB COMPONENTS

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Improvised explosive devices (IEDs) such as pipe bombs are often used to cause fear and devastation within communities. When attempting to analyze DNA from recovered pipe bomb fragments, quantities are often limited which can make DNA typing extremely difficult. Amplifying trace amounts of DNA can cause stochastic effects. Effects such as peak height imbalance, allele and/or locus dropout, and failed amplification can render a profile uninterpretable and result in lost investigative leads. Therefore, the efficiency of the initial collection of DNA from challenging items of evidence is important in order to maximize the amount of DNA available for downstream analysis.

The aim of this study was to optimize the recovery of mock "touch" DNA from common pipe bomb substrates by exploring two swab types (cotton and microFLOQ®) and various direct amplification methods. An epithelial cell suspension (~30 cells or 200 pg DNA) was spiked onto four different pipe bomb substrates (PVC pipe, galvanized steel pipe, electrical tape, and insulated copper wire), and swabbed with either cotton or microFLOQ® swabs. microFLOQ® swabs were placed directly into the PCR reaction for amplification or incubated for 20 minutes at room temperature in 40 µL of TE prior to direct PCR. Cotton swabs were either extracted using the PrepFiler *Express*™ kit on the Automate *Express*™, amplified directly using the GlobalFiler™ PCR Amplification kit, or incubated in 400 µL of TE for 20 minutes prior to amplification.

The results from this study showed that direct amplification of the microFLOQ® swabs resulted in the most complete profiles when amplified directly. This approach also required the least number of steps, which reduced processing time and decreased the risk of contamination.