

## **SUBSAMPLING OF BIOLOGICAL FLUID STAINS ON COTTON CLOTH WITH THE MICROFLOQ® DIRECT SWAB**

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The microFLOQ® Direct Swab (Copan), a micro swab with a swab head ~1mm in diameter that can be used for subsampling biological evidence, is designed after the 4N6FLOQSwab™ with perpendicular nylon fibers on the tip of the swab shaft. The small swab's surface area allows for minute, but concentrated, sampling of biological evidence which can be used for direct amplification. The microFLOQ® Direct Swab was tested by swabbing biological fluid stains (i.e., blood, semen, and saliva) on cotton cloth followed by short tandem repeat typing with the PowerPlex® Fusion 6C System. For example, blood diluted to 10% in physiological saline was prepared as a stain. Swabbings were collected from the center and along the edge of the stains, the subjected to direct amplification. The center stain samples yielded more complete profiles ( $p=4.493 \times 10^{-7}$ ) and greater relative fluorescence units (RFU) ( $p=4.486 \times 10^{-5}$ ) compared to edge sampling. The microFLOQ® swab was also tested with the Casework Direct Kit, Custom (Promega Corporation), which rapidly lyses cellular material on swab substrates and allows for quantification of DNA theoretically added to each direct PCR (although not a direct indicator of the DNA quantity added to each reaction). The Casework Direct Kit, Custom, was tested with and without the reducing agent 1-thioglycerol (TG). The addition of 1X TG to the extraction of semen stains collected with microFLOQ® Direct Swabs increased both profile completeness and signal (RFU) for 1% and 5% semen diluted in physiological saline compared with no TG. Little-to-no difference was seen in the performance of blood and saliva stain samples collected with the microFLOQ® Direct Swab and extracted with Casework Direct Reagent (with and without 1X TG). The microFLOQ® Direct Swab has the potential to impact the way evidence is prescreened in forensic laboratories and can decrease processing time.