

OUR SWABSOLUTION™ SOLUTION! IMPROVING THE FIRST PASS SUCCESS RATE IN A DATABASING LABORATORY THROUGH A MODIFIED DIRECT AMPLIFICATION METHOD

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The expansion of the CODIS Core Loci came with new challenges. In 2017, laboratories across the country had transitioned or were transitioning to “megaplex” STR kits. While kit sensitivity and power of discrimination increased with these kits, the rise in the number of loci amplified seems to have created a new challenge—samples seem to be weak or missing alleles more frequently than with multiplex kits. Furthermore, the addition of more loci and more complex interpretation has increased the amount of time required to perform analysis.

The CODIS Branch utilizes the GlobalFiler™ Express (GFE) Kit for direct amplification (high throughput processing) of buccal samples on Whatman® FTA® Cards (FTA). Upon switching to this megaplex kit, the first pass success rate (FPSR) decreased from 91% using the previous multiplex kit to approximately 80%.

Possible solutions to this problem were investigated. Five methods (1 or 2 Tris-Ethylenediaminetetraacetic Acid (TE) buffer washes, AmpFLSTR™ PCR Enhancer, AmpSolution™, and SwabSolution™) were assessed. SwabSolution™ produced the best results in preliminary studies.

In direct comparison to the standard GFE protocol, not only did the FPSR increase to over 90% using the SwabSolution™ method, but overall signal was improved such that injection times used were able to be reduced by 50% (24 seconds to 12 seconds).

Since implementation of the modified direct amplification using SwabSolution™, the FPSR has increased from 80% to 93%. In addition, the number of samples not producing full profiles with the direct amplification method after repeated attempts was reduced from 10% to 1%.

The SwabSolution™ direct amplification method for processing FTA samples increases efficiency by improving results and decreasing analysis time.

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