

SCRUB, LOOP AND BREAK IS LIKE A CHILD'S PLAY : A VERY FAST, ROBUST AND EASY TO USE PROCEDURE TO GET STANDARDIZED INDIVIDUAL DNA PROFILES FOR HIGH THROUGHPUT DATABASING WITH 100% OF FIRST PASS SUCCESS RATE IN LESS THAN 80 MINUTES.

Hubac S, Dominguez R

Forensic Science Laboratory of the French Gendarmerie (IRCGN™)

Forensic DNA databases are an important investigative resource in contemporary criminal justice systems. Many countries operate forensic DNA databases to identify owners of crime related stains or exonerate people who are innocent. Higher is the number of individual DNA profiles registered stronger is the database. The strategy to collect and analyze DNA sample from individuals is a major issue for the country. For high throughput profiling, the standard methods consist to collect buccal samples with FTA card or regular swab and process direct PCR amplification using complex robotics platforms leading to non standardized positives results and a first pass success rate less than 90% in most of cases. Here, we propose a patent pending collection kit enabling in 3 steps: scrub, loop and break, to collect buccal cells in a standardized way in less than 10 seconds and generate a DNA profile in less than 80 minutes using standard analytical materials with 100% of first pass rate success. DNA amplification is performed with only 10 μ L of GlobalFiler Express PCR amplification master mix with enhancer (Thermo Fisher) on a Veriti Thermal Cycler (28 cycles) followed by capillary electrophoresis (3500 XL). Reproducibility, repeatability and stability tests are done by 3 different persons for the collection procedure (2 forensic specialists and 1 neophyte) on 10 volunteers (5 women and 5 men) at 4 different times: T 0, T+1 month, T+3 months and T+6 months and 5 replicates per volunteers. Full DNA profiles are obtained indifferently by the sampling team for all the volunteers, all the replicates and all the times. This results demonstrates the robustness and the efficiency of this new method to generate standardized individual DNA profiles by simplifying collection procedure, analyze and saving lot of time and money compare to traditional high throughput workflow.