MICROFLOQ® DEVICE ALLOWS REAL TIME CRIME SCENE INVESTIGATIONS

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Forensic DNA analysis can be time-consuming, labor-intensive and costly. Rapid analyses are crucial for judicial and forensic investigations during crime scenes or mass disaster victims' identification process, as terrorist attacks. Solutions for real time DNA profiling directly from crime scene and from all types of traces allow to consider DNA an intelligent and decisional investigation tool.

The microFLOQ® (MF) is an idea conceived and patented by the French Gendarmerie Forensic Research Institute (IRCGN™) and developed by Copan. The MF uses a very small portion of sample and allows direct rapid human DNA (hDNA) amplification and profiling in less than 2 hours with standard instruments, eliminating the extraction and quantification steps.

The objective of this study was to demonstrate the MF collection efficiency and rapid hDNA profiling from crime scene traces.

During a training session at the IRCGN™, a staged crime scene inspection was investigated: a man was found murdered in his apartment, with a broken window, many traces of blood, but also some other evidences like a gun, glasses, cigarette butts, empty bottles. 21 samples were collected with MF from traces and objects in different rooms and surfaces, using Copan collection guides and Gendarmerie chain of custody.

Directly after collection, each MF tip was broken into a microplate well containing master mix of the GlobalFiler™ PCR DNA Amplification assay, amplified and profiled on the Applied Biosystems™ 3500 XL Genetic Analyzer inside a DNA mobile lab parked next to the crime scene.

Full DNA profiles were obtained in less than 2 hours, with no DNA extraction. Rapid and correct counting of blood stain patterns and identification of victim and perpetrator were obtained: their profiles were in the IRCGN™ internal database, matching the forensic scientist donors who set-up the simulated crime scene. Moreover, only a small portion of the traces was used by the MF, without disruption or total consumption of the biological sources, still available for backup collection with standard methods, if further analysis was required.

The microFLOQ® allows direct and rapid DNA profiling from crime scene evidences identifying the correct victim(s) and perpetrator(s), eliminates purification and quantification steps, reduces labor and reagents costs, increases laboratory workload capacity and consumes a small portion of the trace. It is a revolutionary device to use for crime scene rapid screening and can help other forensic investigations.