

COPAN NUCLEIC-CARD™ WHITE AND COLOR PERFORMANCE FOR FORENSIC HUMAN IDENTIFICATION USING DIFFERENT DIRECT STR TYPING CHEMISTRIES AVAILABLE COMMERCIALY

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Background: Copan NUCLEIC-CARD™ White and COLOR (Copan Italia SpA) has been on the market for several years as long term storage devices of DNA from buccal swabs or blood samples for forensic human identification. Both NUCLEIC-CARD™ types are customized products and optimized for manual and automated punching. Originally the performance of NUCLEIC-CARD™ was done only with the Thermo Fisher AmpFLSTR Identifiler Direct PCR typing chemistry. The objective of this study was to evaluate the performance of NUCLEIC-CARD™ White and COLOR using direct PCR amplification and STR profiling technologies available commercially for forensic human identification.

Methods: In this study a pool of buccal swabs and blood samples from different donors were used to test both Copan NUCLEIC-CARD™ types for the analysis of autosomal and Y chromosome STR markers with the PowerPlex Fusion 6C System (Promega), the GlobalFiler Express (Thermo Fisher), the Investigator 24plex GO! (Qiagen), the PowerPlex Y23 System (Promega) and the YFiler Plus (Thermo Fisher) chemistries. Forty microliters of buccal pool were deposited on NUCLEIC-CARD™ COLOR, while 40ul of each blood sample were deposited on NUCLEIC-CARD™ White cards for each donor. Two 1.2mm discs/card were punched with the CPA200 automated puncher to test with each of the five STR profiling technologies.

Results: Full balanced profiles were obtained with both buccal samples on NUCLEIC-CARD™ COLOR and blood samples on NUCLEIC-CARD™ White with all five STR typing technologies, within the recommended parameters of the manufacturers. Less PCR cycles (1 or 2) were used with the NUCLEIC-CARD™ White for blood samples, compared to the NUCLEIC-CARD™ COLOR for saliva samples.

Conclusions: The data obtained demonstrated that both Copan NUCLEIC-CARD™ White and COLOR had a good performance with the Promega PowerPlex Fusion 6C System, the Thermo Fisher GlobalFiler Express, the Qiagen Investigator 24plex GO!, the Promega Y23 PowerPlex System and the Thermo Fisher YFiler Plus kits. Copan NUCLEIC-CARD™ White and NUCLEIC-CARD™ COLOR can be used as reference samples, for DNA data bank and for judicial court cases in forensic human identification.