LONG TERM DNA PRESERVATION FROM BUCCAL SAMPLES COLLECTED WITH 4N6FLOQSWABS® GENETICS

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Properly collected and stored buccal swab samples are important to guarantee accurate forensic investigations. Copan developed the 4N6FLOQSwabs® Genetics for testing of reference and paternity samples.

4N6FLOQSwabs® Genetics are available in 3 formats: peel pouch, dry long tube and short tube with Active Drying System (ADS), which allows sample drying within 24 hours.
The objective of this study was to evaluate the long-term storage stability of human DNA from buccal samples collected with 4N6FLOQSwabs® Genetics.

Five buccal swabs were collected using both 4N6FLOQSwabs® Genetics in tubes with and without ADS from 30 donors. After collection, the swabs without ADS were left to dry at room temperature (RT) before being placed back in their tubes, while the swabs with ADS were placed back, still wet, in their tubes. A set of both swabs type were analyzed at 0 time, while the other sets were used for the 6 and 12 months at RT and -80°C storage conditions. In parallel, accelerated stability at +55°C was conducted on other buccal 4N6FLOQSwabs®, to simulate longer-term storage (> 2 years) at RT.

At each time point, DNA was extracted from all swabs using PrepFiler™ Express Forensic DNA Extraction Kit on the Automate Express. Each extract was loaded into the NanoDrop™ instrument (Thermo Fisher), to verify the purity and the quality of the extracted DNA (ratio 260/230 and 260/280). DNA was quantified using Quantifier® Trio DNA Quantification Kit on the 7500 Real Time PCR instrument (Thermo Fisher). Diluted extracted DNA was profiled using the AmpFLSTR® Identifiler® Plus PCR Amplification assay using 28 PCR cycles on the 3130 Genetic Analyzer (Applied Biosystems).

For each sample, the amount of DNA recovered, the degradation index, the average STR peak height and the 260/230 and 260/280 ratios were analyzed and recorded.

Complete and good quality STR profiles were obtained from all samples collected with both 4N6FLOQSwabs® Genetics, in dry long tube and in short tube with Active Drying System (ADS), up to 12 months' storage at RT and -80°C. After 12 months, the degradation index was still ≤1, indicating no DNA degradation, and the results obtained with NanoDrop™ indicate good purity of extracted DNA.

The accelerated results obtained on 2 years simulated aged samples demonstrated good DNA preservation in terms of complete STR profiles, DNA purity and quality. Longer times stability is still ongoing. In conclusion, Copan 4N6FLOQSwabs® Genetics are suitable for long term preservation of DNA from buccal samples for paternity and forensic investigations.