

## **NEW EASY METHOD, FAST SYSTEM AND SIMPLE KIT WITHOUT DESTROYING SAMPLE, FOR HUMAN FORENSIC IDENTIFICATION: TESTING IN REAL TIME CONDITIONS**

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**Background:** There are not kits that allow the determination of the human forensic identification from teeth quickly, efficiently and without destroying the sample. In air accidents, natural disasters or terrorism the availability of susceptible tissue to be used in forensic analysis could be limited to bones and teeth. The classic kits use bones and teeth destroying the sample, are difficult to handle with high risk of contamination and longer time in delivering the genetic profile. The new kit is unique because delivers results in hours, it does not destroy the sample and is easiest to handle with low risk of contamination.

**Aim:** Test the methodology and the kit in real conditions of use.

**Methods:** In 5 corpses of 1 month, 4 men and 1 woman between 47-83 years old, were obtained 6 teeth that given 11 samples for testing, the genomic DNA was extracted with the new forensic methodology and kit (Patent Scope N°US-20160123853). Also were obtained samples of buccal swap and blood samples in FTA filters as controls. The DNA from control samples were obtained with the Maxwell 16 (Promega). Genetic profiles were obtained with the GlobalFiler™ STR Kits (Thermo Fisher Sci.). At the end of the methodology, teeth were returned to the human bodies. The success was calculated related to the 24STRs obtained from the blood and buccal swap and dental samples. The time for making the genetic profile was calculated for dental pulp and for root cement samples. Using the database of the Chilean population we calculated the random match probability.

**Results:** Control samples gave complete genetic profiles (24 STRs). Analysis of 5 human bodies allowed the identification of 3 of them with fully 24 STRs, the best probability of random coincidence was 1 in 3,04 E+19 individuals. Other 2 bodies gave incomplete genetic profiles between 7 and 16 STRs with a probability of random coincidence of 1 in 1,48E+03. The 6 dental samples generated 11 genomic DNA, gave 7 complete genetic profiles and 4 partial genetic profiles, 64% success. The time used for obtaining the genetic profile was 20 hours for dental pulp and 12 hours for root cement.

**Discussion:** The testing of the kit and methodology under real conditions demonstrated the effectiveness in obtaining useful genetic profiles for forensic identification, without destroying the dental sample. The dental pulp tissue and the root cement proved to be useful in obtaining complete genetic profiles, however the methodology applied to root cement delivers results in a shorter time.