NUCLEAR DNA TYPING FROM ANCIENT TEETH

Sosa C, Baeta M, Núñez C, Casalod Y, Martínez-Jarreta B.
Department of Forensic Medicine, Faculty of Medicine, University of Zaragoza, C/Domingo Miral s/n, Zaragoza 50009, Spain.

Due to the adverse effects that diagenesis exerts on ancient skeletal remains, DNA from these samples is often compromised to the point where genetic typing is very challenging or not possible. Nevertheless, robust and reliable methodologies are currently available for the forensic community and frequently allow the successful genotyping of ancient specimens. Here we report the methods and strategies used to genotype two human skeletons from a medieval burial. Special procedures to reduce the risk of contamination of ancient samples with exogenous DNA were undertaken. DNA from bone and tooth was extracted in duplicate using a silica-based purification method. Two overlapping fragments of the HVI region of mitochondrial DNA were amplified. Autosomal short tandem repeat loci were studied using a standard human identification STR kit and a kit optimized for the analysis of miniSTRs in challenging samples. Mitochondrial DNA analyses of the two subjects were inconclusive whereas nuclear DNA profiles were obtained from one of them. The attempts to amplify autosomal STRs using a standard human identification STR kit were unsuccessful. Nevertheless, a complete nuclear miniSTRs profile was obtained from a well-preserved premolar, but only a partial one from the femur. Increasing the sensitivity of the PCR system allowed a full profile from the latter, but the presence of artefacts reinforced the idea that the interpretation of this kind of analyses must be performed with caution. The results presented here also indicate that DNA from dental pieces can be better preserved than that from bones - even in the case of well preserved long bones with thick cortical tissue such as the femurs - and have better chances of successful genetic typing, probably due to the high degree of protection conferred to DNA by enamel.