



## **Post-depositional elemental and isotopic modification of archaeological bone and tooth samples: analytical cognition tools and solution strategies**

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Modifications and structural changes that take place on ancient skeletal remains and teeth by cumulative, chemical and biological alterations are referred to as diagenesis. These processes modify the original chemical and microstructural properties of the skeletal remains and their macroscopic preservation status in various ways. As biogenic elemental and isotopic fingerprints offer an important approach for the reconstruction of an individual's life history (e.g. nutrition, intoxication or provenance), the identification of the type and degree of diagenetic alterations in buried human remains and their effect on the analytical result is a central concern.

Within this study, diagenetically affected historic human and animal tooth and bone samples originating from different Austrian excavation sites were investigated in detail for morphological alterations as well as by elemental (e.g. P, Ca, Sr, U) and Sr isotopic analysis. The degree of diagenesis was evaluated by establishing mixing lines of biogenic and diagenetic isotopic information. The studies were completed by macro- and microscopic investigation of the state of preservation. Besides mathematical models, a sequential leaching procedure was modified to separate biogenic and diagenetic Sr for subsequent isotopic analysis. In this context, studies on morphological differences and the entailed variable effects of diagenesis in human and animal hard tissues (bone, tooth dentine and enamel) are shown.