



## **Geographical Origin Determination of Unidentified Corpses by Stable Isotope Techniques – Isotope Ratios of H, C, N and S in Different Body Tissues**

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Measurements of stable isotope abundance ratios of the bio-elements (H, C, N, O and S) and the geo-elements (Sr and Pb) in body tissues of dead persons are carried out in order to provide hints about the geographical origin and the place of residence of unidentified persons. The elements are incorporated via food, beverages and aerosols. The examination of different body tissues essentially enables tracking down the places where a person has resided during various lifetimes, since they display different growth times and turnover rates. Isotope ratios in various tissues (e.g. teeth, bones, hair and nails) of adult persons bear information about periods of life from childhood through to the last months and weeks before death.

Isotope ratios of the bio-elements are analysed on the proteins, i.e. keratins from hair and nails, or collagens from teeth and bones. Not only geographical and dietary changes are responsible for variable isotope ratios of the elements in keratin and collagen, but also different amino acid compositions of the respective proteins.

A hair database is being established by the authors. It contains isotope data of worldwide human hair samples, which serve as a basis for geographical origin determination of individuals. For comparison of the isotope data of bone collagen with reference hair samples, basic "correction factors" for the bio-elements, taking into account molecular (compositional) differences between the proteins must be figured out. As feeding experiments with human individuals over years or decades are not realizable, one approach to determine these factors is to compare the results of isotope ratios in different body tissues from corpses, which were investigated during feasibility studies as well as case reports for geographic determination of unidentified bodies. Our results will be presented and discussed.