

## **Preliminary results of radiocarbon dating of amino acids: A novel tool for biogeochemistry and chronology**

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During the last a couple of decades, compound-specific radiocarbon analysis (CSRA) has been a useful tool for chronology, source identification, and carbon cycle study [1]. Among various literatures reporting CSRA results, few studies have investigated amino acids [2,3,4]. A major obstacle for the amino acid CSRA is a difficulty of isolation/purification of underivatized amino acids from the natural samples like organisms and sediments that are complex mixtures of organic matter. We have recently developed a method to overcome this issue by HPLC/fraction collection with subsequent recrystallization of the amino acids from the isolated fraction. Comparison of radiocarbon ages between amino acid standards and the processed standards fit well, suggesting that above procedure seems to be applicable to at least collagen samples. We will present the results of some preliminary applications to modern/ancient bone collagens and modern fish muscle collagen samples. Accurate dates would be determined by measuring hydroxyproline from bone collagen samples, whereas metabolic processes related to amino acid synthesis may reflect the apparent age of amino acids (dispesable vs. indispensable) from fish muscle. Furthermore, this method may be useful for determining the sediment chronologies because amino acids are most abundant organic group in the sediment.

- [1] Eglinton *et al.* (1996) *Anal Chem* **68**, 904-912. [2] Stafford *et al.* (1990) *Quat Res* **34**, 111-120. [3] McCullagh *et al.* (2010) *Radiocarbon* **52**, 620-634. [4] Marom *et al.* (2012) *PNAS* **109**, 6878-6881.