Isolation and purification of individual amino acids by HPLC for precise small-scale radiocarbon dating of archaeological bones.

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To obtain accurate radiocarbon dates, individual amino acids, specifically for hydroxyproline (Hyp), isolated from protein with high performance liquid chromatography (HPLC) have been recently anticipated to be a compound group suited for radiocarbon dating [1]. We have optimized a method of isolation of individual amino acids using reversed-phase HPLC and further purification step prior to the compound-specific radiocarbon measurement.

The average recoveries of the authentic standard amino acids were better than 70% and the ^{14}C difference was approximately 14‰ through the entire purification processes. We have also applied the method to some archaeological human and animal bone collagen samples with known ages. In the result, the ^{14}C age differences between bulk collagen and Hyp were small and constant. With a purification step after the HPLC separation, this method enable isolation of individual amino acids with a small effect for radiocarbon age.

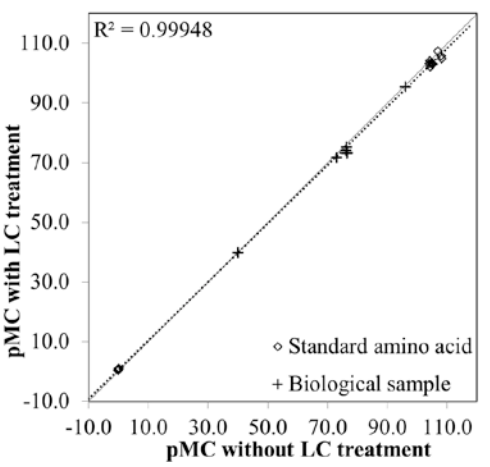

Figure 1: The verification of consistency for pMC of samples between with and without LC treatment.

[1] McCullagh et al. (2010) Radiocarbon **52**, 620–634.