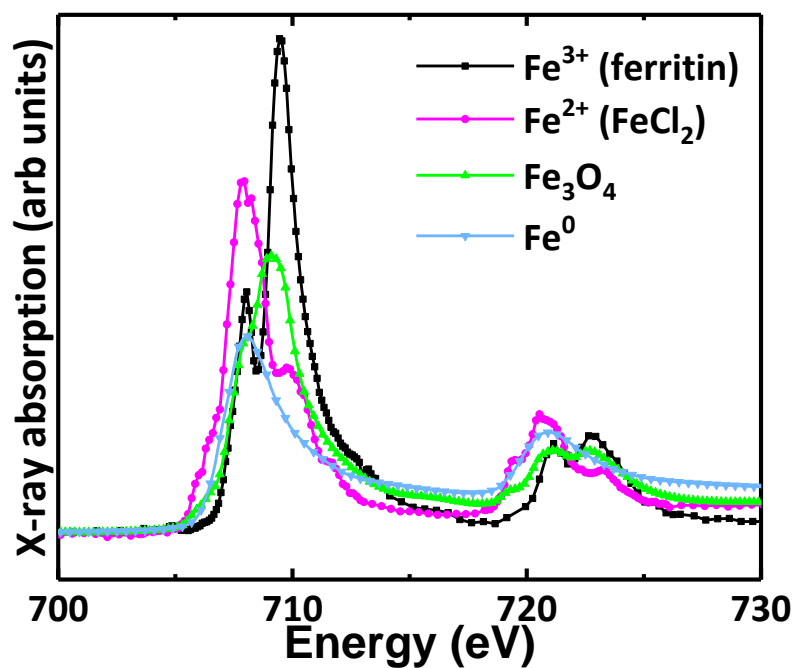
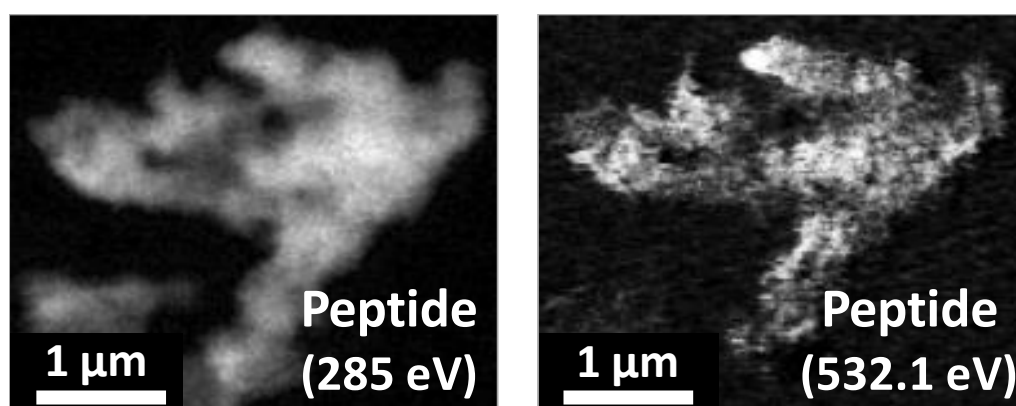


## Supplementary figures

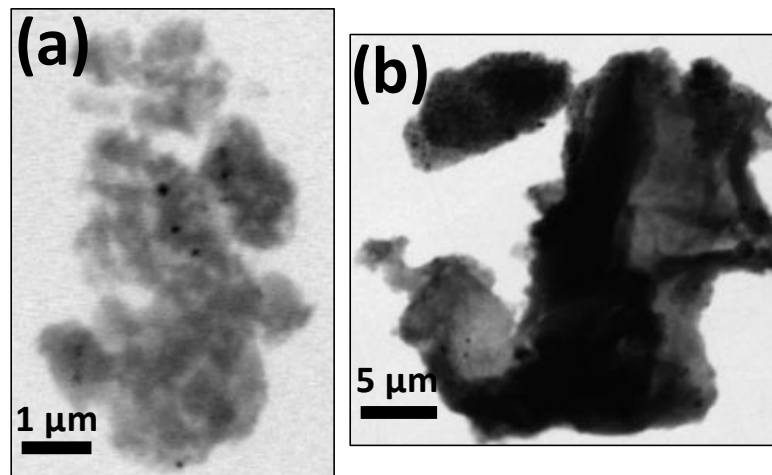
**Figure S1.** Scaled iron  $L_{2,3}$ -edge absorption reference spectra used to fit the amyloid plaque core iron spectra described in the main text.



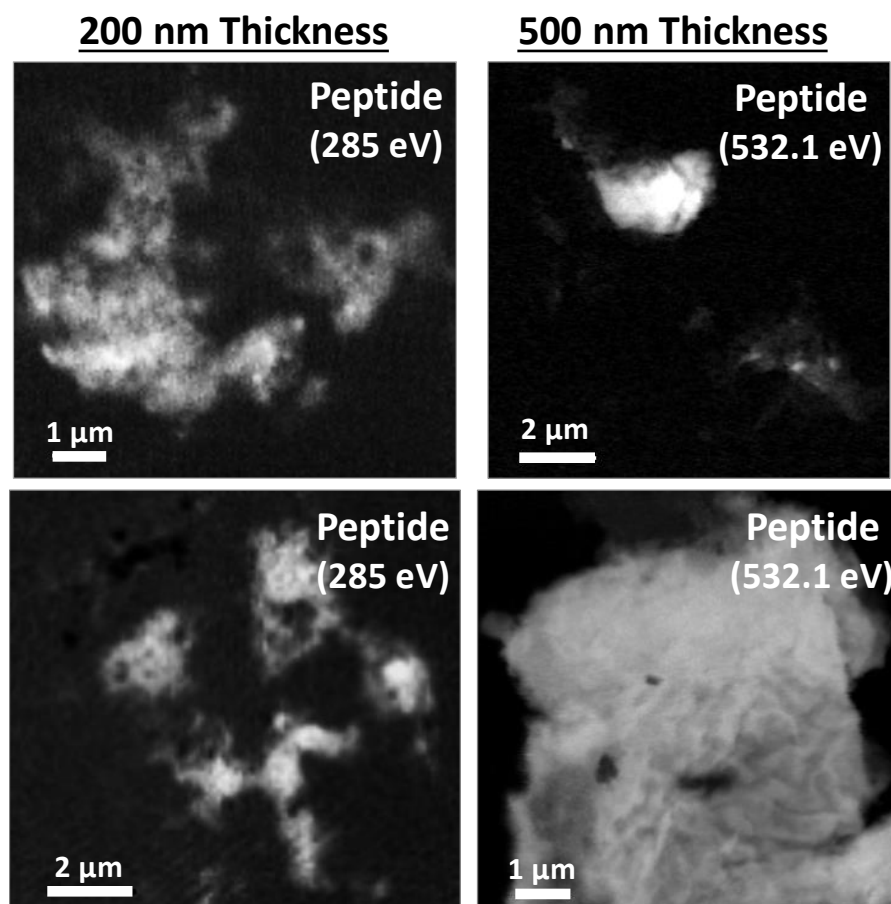
**Figure S2.** Positive correlation between x-ray microscopy peptide maps taken at the carbon  $K$ -absorption edge (left) and oxygen  $K$ -absorption edge (right) absorption edges of a plaque core taken from case Y. Section thickness = 500 nm.



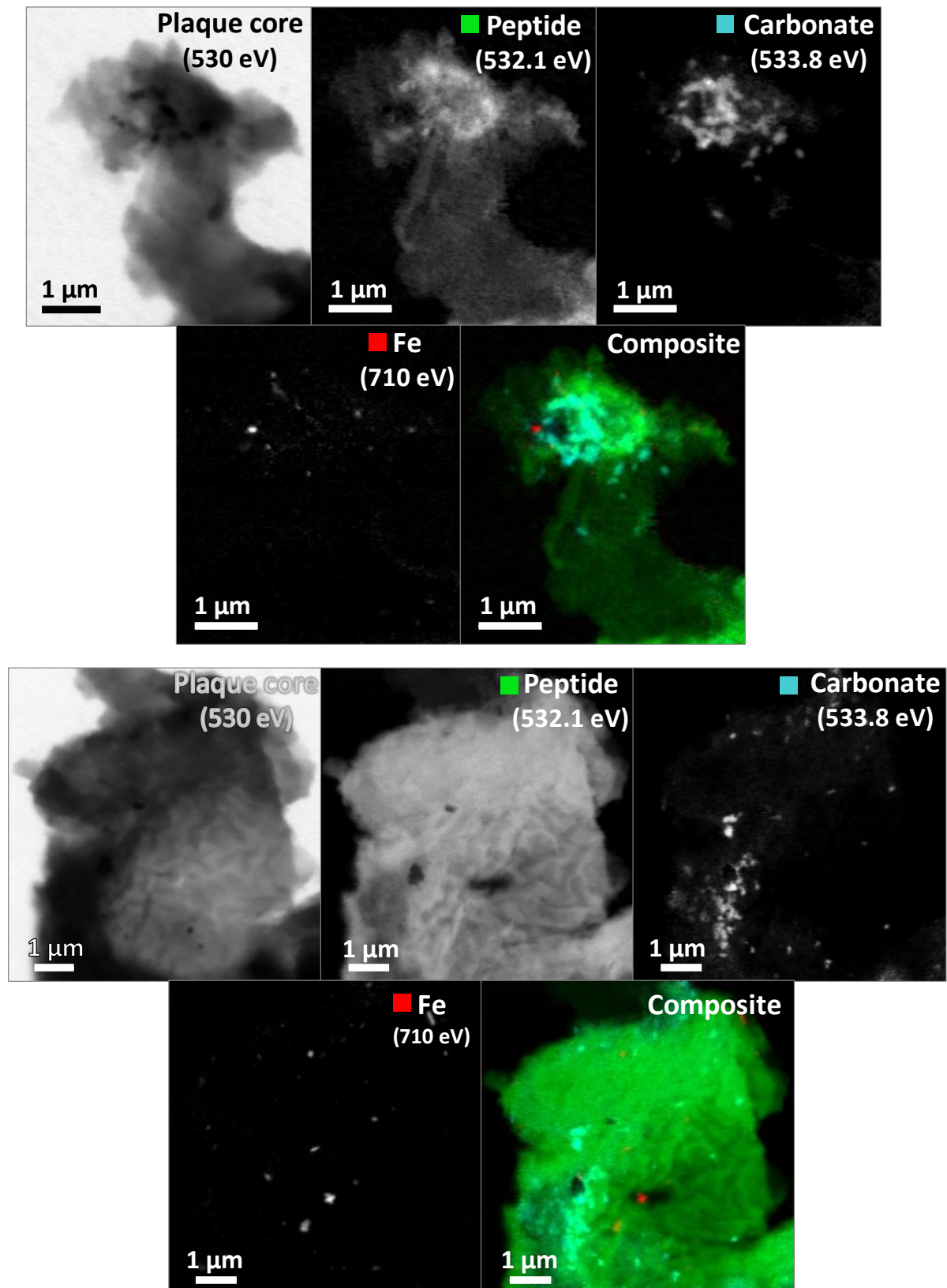
**Figure S3.** X-ray microscopy images taken at 530 eV, displaying the variation in amyloid plaque core size. From AD case Y. Section thickness = 500 nm.



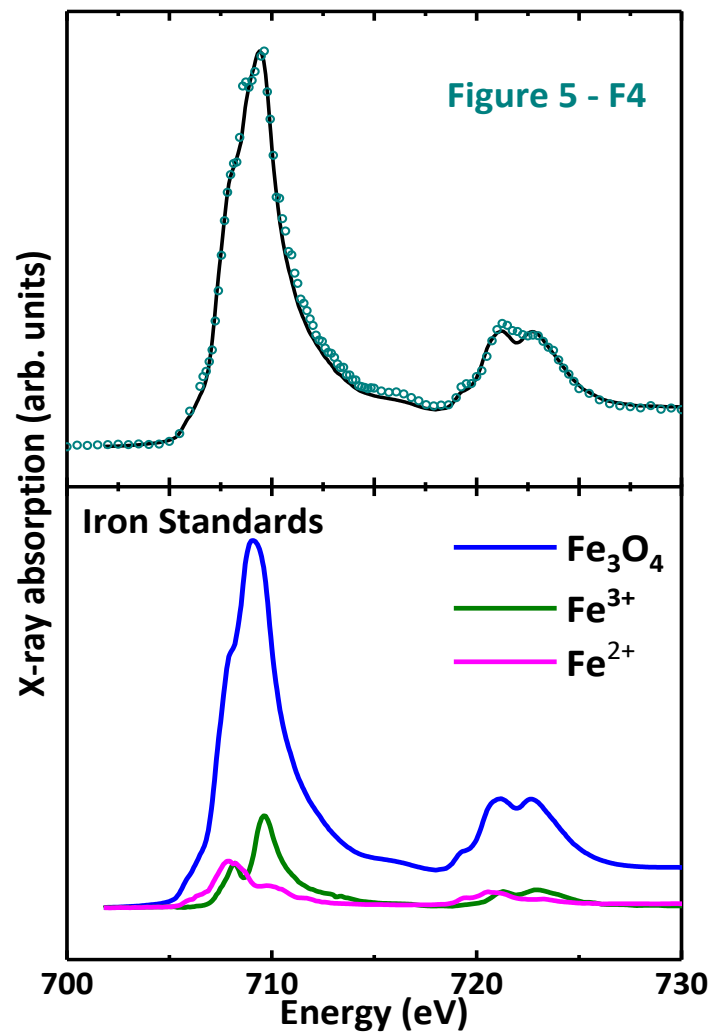
**Figure S4.** Comparisons of x-ray microscopy peptide maps obtained from amyloid plaque cores 200 nm (left) and 500 nm (right) in thickness. 200 nm and 500 nm sections are from cases X and Y respectively.



**Figure S5.** X-ray microscopy images and speciation dependent maps of amyloid plaque cores from case Y.



**Figure S6.** Relative intensities of the iron  $L_{2,3}$ -edge absorption reference spectra used to create a fit for spectrum F4 from Figure 5 in the main text.



**Figure S7.** Relative intensities of the iron  $L_{2,3}$ -edge absorption reference spectra used to create a fit for spectrum H1 from Figure 5 in the main text.

