

# Synchrotron-based X-ray fluorescence microscopy enables multiscale spatial visualization of ions involved in fungal lignocellulose deconstruction

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**Supplementary Movie 1.** 360 degree rotations micron-scale resolution XFM ion volume reconstructions of a wood sliver and attached fungal fragments and ECM residue cut from the Fe-rich region near the bottom of exposed Block 3 (Figure 1). During tomographic reconstruction, the quantification of the ions was lost, however relative ion concentration differences can be detected and compared. The ratios indicated are molar ratios with respect to the amount of Zn. The boxes have a square base of 90  $\mu\text{m}$  per side and a 75  $\mu\text{m}$  height.

**Supplementary Movie 2.** 360-degree rotations of Ca K Fe (a, d), Ca Mn Fe (b, e), Ca Zn Fe (c, f) ion collocation volume reconstructions (a-c) and orthogonal cuts (d-f) from the volume of ion concentration

within ECM residual material located near the bottom of the wood sliver (Figure 7). The boxes have a rectangular base of 21  $\mu\text{m}$  by 24.3  $\mu\text{m}$  and a 30  $\mu\text{m}$  height. The ratios indicated in the figure are molar ratios with respect to the amount of Zn.