Isotope metallomics of aging mice

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The metallome, including metal concentrations and isotopic compositions, is suspected to be variable during lifetime having thus the potential for capturing some specificities of aging. Here, we have measured a suite of trace element concentrations as well as the Cu and Zn isotope compositions in organs (liver, muscle, kidney, brain and heart) at different time points (6, 16 and 24 months) of aging mice. The mice were also characterized by phenomic, metabolomic and proteomic analysis. The results show a wealth of associations between the (isotopic) metallome and other omic layers. We show for instance that changes in hepatic Cu isotope compositions are correlated to age and recapitulate several aspects of the glucose/fat metabolism. For the first time for animals, we introduce metallomic as a new omic layer and adapt classic bioinformatic tools to integrate it as a new component of biological systems.