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Magnesium Isotope Compositions as a Diagnostic Tool: Exploring Mg Status Across Mouse Organs and Ages

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Magnesium (Mg), the second most abundant intracellular cation in the body, plays an important role in RNA and DNA synthesis, bone and teeth formation, muscular contraction, the cardiovascular tone, nerve transmission and insulin metabolism. However, assessing total Mg status using common laboratory methods is challenging due to the low content of Mg in serum and other body fluids.

The Mg isotope compositions (δ^{26}Mg) were used to trace conditions such as obesity, diabetes and endotoxemia, indicating that Mg isotopes can be a valuable tool for assessing Mg status and diagnosing related diseases. Despite this potential, the limited availability of Mg isotope data across different animal organs and biological reference materials limits broader applications and inter-laboratory comparisons. In addition, the impact of aging on the Mg isotopic composition of organs remains unexplored systematically while it has been previously shown to affect the stable isotopic composition of other elements. In this study, we present the Mg isotope compositions of various organs from 15 mice of ages 3, 6, 9 and 12 months, as well as six biological references. The δ^{26}Mg of ERM CE464 and ERM BB184 in this study are -1.50 ± 0.09 ‰ (2SD, n = 3) and -1.019 ± 0.08 ‰ (2SD, n = 3), respectively, consistent with literature values. The data for the organs are currently being processed and will be presented at the conference.