COPPER ISOTOPIC COMPOSITION OF ISOLATED CERULOPLASMIN FROM HUMAN SERUM **Kerri A. Miller[1]**, Arnie Charbonneau[1] Patrick L. Day[2], Anthony Maus[2], Paul J. Jannetto[2], Sunil Q. Mehta[3], Mukesh K. Pandey[2], Michael E. Wieser[1], [1]Cancer Institute, University of Calgary, 2500 University Drive NW, T2N 1N4, Calgary, AB, Canada; [2]Department of Laboratory Medicine and Pathology, Mayo Clinic, Rochester, MN, United States, 55905; [3]PrairieCare Medical Group, Rochester, MN, United States, 55905.

Copper stable isotope composition of blood serum has provided valuable insights into alteration of copper processing due to a disorder or disease. One persistent challenge is understanding the mechanism for these changes, which in living systems is the result of changes in binding sites available for the metal. Here we have developed an immuno-purification procedure for ceruloplasmin using antibody-coated magnetic beads to measure the isotopic composition of ceruloplasmin in human blood serum. We have assessed the isotopic composition of this protein and compared to the bulk serum and residual serum after ceruloplasmin removal. We tested this procedure in male and female adults, and in children between the ages of 2-4 years old with autism spectrum disorder and healthy age-matched controls. In adults, the measured isotopic composition of ceruloplasmin is consistent with theoretical predictions for those specific binding sites. In the children the measured isotopic composition did not match the theoretical predictions and indicate other factors driving the isotopic fractionation observed for ceruloplasmin in this age group. The ability to characterize the isotopic composition of individual proteins will be a critical tool to understand metal-protein interactions.