**Association of hemodialysis patient plasma trace metals with response to erythropoiesis stimulating agents**

Metallomics Analysis: NIH ERCMRC

PI, RTI RCMRC P&F Study: Michael Merchant

University of Louisville

Institutional Review Board No.: 10.0654

**Abstract:**

Erythropoietin (EPO) is a cytokine used to treat the anemia of chronic renal disease in greater than 90% of all in-center hemodialysis patients at a cost of approximately 2 billion dollars per year (2010). Despite protocols for anemia management in the end stage kidney disease (ESKD) population, a large proportion of patients do not predictably respond to typical doses of EPO. Several recent randomized controlled trials looking to increase hemoglobin in patients with the anemia of renal disease have uncovered many questions about the treatment of anemia with erythropoietic stimulating agents (ESA) not previously addressed in new drug applications or in subsequent research. We sought to test the hypothesis that serum trace metal concentrations correlate with markers of anemia and response to ESA treatment.

EDTA-Plasma from 110 hemodialysis patients participating in an NIDDK funded study (R01-01DK091584) were analyzed by ICP-MS for the concentration of As, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Sb, Se, Sn, V, and Zn. Associations were determined between trace metals and gender, race, hemodialysis status, hemoglobin at the time of draw (Hgb), total ESA dose for the month the sample was collected (EPO), and erythropoietin resistance index determined over the 6 months of treatment leading up to sample collection (ERI).

**Sample Description**

EDTA-Plasma from 110 hemodialysis patients participating in an NIDDK funded study (R01-01DK091584).

The data required for the ICP-MS metallomics analysis can be found in the accompanying files and folders:

Procedures: 1. Metals and ESA Response Procedure.docx

Study Design Table: 2. Metals and ESA Response Study Design Table.xlsx

Metadata: 3. Metals and ESA Response METADATA.xlsx

Processed Data: 4. Metals and ESA Response Concentration Data.xlsx

Raw Data (folder): 5. Metals and ESA Response Raw Data.zip