

## **Cognitive Effects of Manganese Exposure in Children**

The hypothesis to be tested in this study is that low-level exposure to manganese in children through drinking water is associated with impaired cognitive performance on standardized tests of intellectual function. The study is based on the pathological and toxicological effects of exposure to manganese in laboratory animals and recent epidemiologic evidence showing an association between exposures to manganese in drinking water and decreased intellectual function (IQ) as well as hyperactive behaviors in children. A clear analogy with lead exists. California has a statewide monitoring system for drinking water manganese; which will be used to identify school districts for water sampling and analysis. We will identify target school districts for sampling from the California Department of Public Health Drinking Water Program to identify 50 school districts with suspected manganese concentrations above 300 µg/L and 50 below that value. Water samples will be collected from each district and analyzed for Mn concentration. Cognitive assessment will be determined from standardized test score data for 3rd-5th grade school district. Multivariate linear and logistic regression analyses will be used to analyze the data and adjusted for covariates including age, sex, ethnicity, parental education and economic status. If this association is validated in future studies, the public health consequences would be substantial, as has been clearly demonstration for low level exposure of children to lead.