

Non-invasive *In Vivo* Quantification of Metals in Human Tissue

Linda H. Nie, School of Health Sciences, Purdue University

Abstract:

The broad applications of metals in industry, agriculture, and other fields have dramatically increased metal exposure to human population over the last several decades. Studies have linked metal exposures to various health effects and diseases. Many metals accumulate in bone. Metal concentration in bone provides unique information regarding long term chronic metal exposure, a pattern seen in most of the exposure scenarios. X-ray fluorescence (XRF) and Neutron activation analysis (NAA) are two powerful noninvasive techniques for in vivo quantification of metals. In our lab, two XRF systems and one NAA system were developed and validated to measure multiple metals, such as lead (Pb), strontium (Sr), manganese (Mn), aluminum (Al), sodium (Na), calcium (Ca), etc., in bone and/or toenail in vivo. In this project, Dr. Nie will introduce these technologies, explain the development of these systems, talk about the application of the technology in epidemiology studies, and show some of the data we collected on studies of the health effects of metals. Possible collaborations with biostatisticians on data analysis will be discussed.