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MOLECULAR EPIDEMIOLOGY: LEAD, BONES, PLASMA, AND GENES

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Although lead toxicity is perhaps the most studied hazard in all of environmental health, huge gaps remain in our knowledge, particular with respect to understanding the long-term health effects of lead and susceptibility factors. In this talk Dr. Hu will discuss his laboratory's 15-year history of research on lead toxicity, particularly with respect to the development of "molecular epidemiology" tools in the form of better biological markers of dose and genotyping for candidate polymorphisms in association studies. Emphasis will be placed on the development of K-x-ray fluorescence as a method for making in-vivo measurements of lead in bone and studies demonstrating bone lead level's ability to predict adverse outcomes such as hypertension, cardiac conduction abnormalities, and impaired fetal development. Measurement of lead in plasma, a new biological marker signifying the fraction of circulating lead that is most bioavailable to cross cell membranes, will also be discussed. Finally, we will review recent studies looking at candidate polymorphisms as modifiers of lead toxicity.