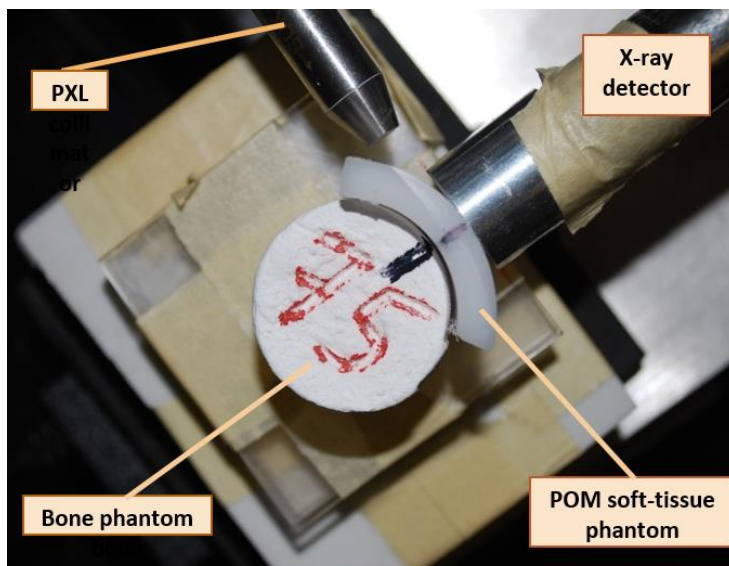




# COLLOQUIUM



Dr. Mihai Gherase  
California State University, Fresno

## **X-ray fluorescence (XRF) methods for *in vivo* bone lead (Pb) concentration measurements**

### **Abstract**

Lead (Pb) is a well-known neurotoxin. Clinical research over the past two decades indicates that there is no safe threshold of Pb exposure; neurodevelopmental problems in children were associated with low blood Pb levels ( $<10 \mu\text{g/dL}$ ). Blood Pb concentration measurement by sensitive mass spectrometry instrumentation is the current metric used in the clinical assessment of human Pb exposure. Bones, however, store about 95% of human body Pb burden. Exposure to Pb over many years or decades leads to its accumulation in bones where it resides for 15 to 20 years in adults. Therefore, bone Pb concentration is a better metric of cumulative long-term Pb exposure. *In vivo* bone Pb measurements using a noninvasive x-ray fluorescence (XRF) method were pioneered in Sweden in the 1970s. Two experimental approaches known by their acronyms as KXRF and LXRF (excitations of K- or L-shell atomic electrons of Pb) were investigated and developed throughout the early and mid-1980s. KXRF was the adopted method for clinical measurements over the past three decades. The talk will include a brief review of past and recent Pb exposure, XRF process, *in vivo* bone Pb XRF measurements and our research efforts aimed at improving bone Pb LXRF measurements using a microbeam XRF system.

<https://fresnostate.zoom.us/j/86876409409?pwd=VEhTMk05ZEJmbUtQcThMNDVnQURZZz09>

3:00 p.m. – 4:00 pm Friday, April 9<sup>th</sup> Virtual