

**The Physical and Chemical Basis for X-ray
Nanotechnology**

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Abstract

In this presentation, I will introduce the subject of X-ray nanochemistry, which is a discipline that studies how to use nanochemistry to harvest X-rays, i.e., to use nanochemistry to convert X-ray photons to other forms of energy including chemical, optical, magnetic, electrical and possibly thermal energies. The emphasis of the discussion is on the chemical and physical basis of X-ray nanochemistry, which include physical and chemical processes that are used to convert X-ray energy to other forms of energy. For example, energetic electrons are the main energy chaperon that moves X-ray to chemical or optical energy. This is the physical basis of X-ray nanochemistry. On the other hand, catalysis is discovered to play an important role in this energy conversion process. This forms a major chemical basis of X-ray nanochemistry.

Biography

Ting Guo is Professor of the Department of Chemistry. Ting received her Ph.D. in chemistry from Rice University and conducted his postdoctoral work at the University of California, San Diego. He has pioneered a new scientific discipline called X-ray nanochemistry. His research group is working on many projects in this area as well as other areas through collaborations with colleagues on UC Davis campus. These works may lead to many practical applications such as treating cancer without the side effect of radiotherapy and chemotherapy, detecting draught stress in plants, drying crops with minimal use of clean energy, and delivering genetic contents into live plants with high spatial precision.