



THE LONG ISLAND SUBSECTION OF THE NEW YORK AMERICAN CHEMICAL SOCIETY

Proudly presents

Dr. Qi Wang,

Department of Chemistry, Nassau Community College

Title of Talk: “Synchrotron Views of Transition Elements: Understanding Neuro -degeneration and Nanostructure”

Synopsis: Transition elements feature varied electronic and structural properties and have great importance in both biological and chemical systems. The interplay among the atoms of these elements and others leads to rich behaviors and surprising functions. For example, traces of metallic ion-contained proteins play essential roles for the biological metabolisms while the excess or deficiency may disrupt the normalities. Dr. Wang will present the evidence that metal accumulation is associated with protein misfolding, which has been believed to be a critical factor in neurodegenerative disorders (Alzheimer’s disease, Scrapie, etc.). The work highlighted the utilization of synchrotron-based x-ray fluorescence (XRF), in situ imaging metal (notably Cu, Fe, Zn) ion distributions, concentrations and oxidation states as the function of disease severity (using an animal model). The results were spatially and temporally correlated with the secondary structure of proteins (a-helices vs. b-sheets) in the same tissue samples by applying synchrotron Fourier transform infrared microspectroscopy (FTIRM). The coordinated analysis of metal species and protein conformations shed light on the association between metal dyshomostasis and neurodegeneration. In the second example, I will discuss an investigation of the nanostructures involved with transition metals (eg. Pt, Pd). We have conducted the research aimed at the fundamental understanding of nanoparticles by examining the electronic attributes, structural parameters (particle size, shape) and thermal behaviors. In this regard, a third synchrotron-based technique, X-ray fine structure spectroscopy (XAFS), was employed. The study provided the benchmark information for designing and tailoring the formation of nanostructures towards the potential properties and applications. The materials are based upon the research work done at National Synchrotron Light Source and Advanced Photon Sources. The presenter acknowledges the supports by the grants from U.S. Department of Energy and National Institute of Health.

All are welcome!

When: Thursday, February 6th, 2020

Where: Queensborough Community College, Science Building Rm S-112

Time: 5:30 p.m. – Social w/ Light Refreshments; 6:00 pm – Seminar Start

Directions: <http://www.qcc.cuny.edu/about/driving.html>

After Seminar Dinner: At a nearby restaurant, \$25 per person.

