

## FALL 2016 CHEMISTRY COLLOQUIA, Co-Sponsored by Sigma Xi



### **Dr. Bryant C. Nelson, National Institute of Standards and Technology (NIST)**

**December 2, 2016**

#### **“Fundamental Interactions of Engineered Nanomaterials with DNA”**

Genomic DNA is continuously under attack from free radicals generated during endogenous metabolic processes and from free radicals generated from exogenous sources such as carcinogenic compounds in cigarette smoke, redox-cycling drugs and ionizing radiation. The ensuing transformation of DNA can lead to a multiplicity of DNA lesions such as abasic sites, oxidatively-modified bases and single strand breaks. If these lesions are not successfully repaired by a redundant DNA repair enzyme network, accumulation of the lesions can potentially result in mutagenesis, carcinogenesis, neurodegeneration and/or premature aging. Our laboratory is currently developing sensitive mass spectrometry based methods for accurately characterizing and measuring the formation and accumulation of oxidatively-modified DNA lesions induced by the interaction of nanomaterials (silver nanoparticles, carbon nanotubes, etc.) with DNA using organism models (plants, nematodes, etc.) of increasing biological complexity. The accurate measurement of nanomaterial induced DNA damage will allow us to better characterize the biochemical interactions of nanomaterials with DNA and also allow us to potentially understand the biological consequences of these interactions.

**3:15 Refreshments**  
**3:30 Seminar**

**112 Hamilton Hall**  
**Open to the public**

