



# PHYSICS AND ASTRONOMY COLLOQUIUM

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### “Optimization of Bio-Nano Interface Using Gold Nanostructures as a Model Nanoparticle System”

#### Abstract

Advances in the field of nanotechnology have produced nanoparticles (NPs) with distinct, optical, electronic, and magnetic properties for many biomedical applications. To engineer NPs for optimal clinical applications, it is important to understand the interactions of NP-based therapeutic and imaging systems in a real biological environment, based on their size, shape, and surface properties. Among other NP systems, Gold Nanoparticles (GNPs) were used as a model NP system to improve the bio-nano interface since their size, shape, and surface properties can be varied easily. For example, NPs with diameter 50 nm showed the highest uptake among the size range 20-100 nm at monolayer level, while NPs of diameter 20 nm showed the highest accumulation at tissue-level. Elucidation of the physiochemical properties in a relevant biological environment will allow the development of guidelines for an appropriate design of NPs for different biomedical applications. A better understanding of the interface between nanotechnology and biology would accelerate the use of NPs in clinical-based applications. In particular, I will discuss the use of nanotechnology to improve cancer therapeutics. A multifunctional platform based on GNPs with targeting of ligands and therapeutic molecules holds an array of promising directions in the future cancer research.

Tuesday, March 24, 2015

3:00 p.m.

Elliott Building

Room 162