

Department of Chemistry and Molecular Biology Seminar  
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## **Nanoparticle Fluorescence Based Technology For Biological Applications**

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In this presentation, I will mainly discuss the potential applications of luminescence nanoparticles for biomedical applications. I will start by discussing the definition of so called nanotechnology. Then, I will introduce the methods for making highly luminescence semiconductor nanoparticles and nanoparticle bioconjugation. Next, I will focus on my projects for using near-infrared and upconversion nanoparticles for in vivo cancer imaging, particularly for tumor vascular imaging, hypoxia and dose imaging. Then, I will present the basic concepts for nanoparticle photodynamic therapy in combination with radiation therapy for cancer treatment. Finally, I will discuss the application of nanoparticle systems for bacteria and virus detection based on energy transfer and antigen-antibody interaction as well as quantum dots for fingerprint detection.