Cancer Nanotechnology (BioE479 and BioE598)

Spring 2019

**Home Work #1**

**Due Date: Tuesday, February 12, After Class (2 pm)**

1. Describe the scholarly works of Richard Feynman and Richard Smalley. For what specific contributions was each of them awarded a Nobel Prize?
2. What is CAR-T, and how does it work? Discuss the contributions of Steven Rosenberg and Carl June to the development of cancer immunotherapy.
3. What is cancer, and how is it similar or different to tumor? Discuss the properties or attributes of malignant and benign tumors.
4. Calculate the number of nanoparticles in a single cancer cell (assuming spherical shape and a diameter of 10 μm) if the nanoparticle concentration is 0.1 nM.

1. Explain the quantum confinement effect? For a semiconductor nanoparticle such as quantum dot (QD), would the bandgap energy go up or down if the particle size decreases, and why?