



## **Nanomaterials for Biomedical Applications – Biosensors and Bionanocomposites**

**Wednesday March 31, 2010**  
***Babbio 122, 11 am***

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Nanostructured materials may exhibit novel and significantly improved properties and the systematic organization of matter on the nanoscale is also a key feature of biological systems. As a result, nanomaterials may have novel properties and functions that are particularly useful for biomedical applications. This presentation will provide a few examples on how nanomaterials and nanostructures could be applied to make sensors and nanocomposites with potential biomedical applications. We recently developed a three-dimensional (3-D) nanostructured DNA probe electrodes for electrochemical DNA detection. The unique probe design provides highly sensitive (attomolar sensitivity), rapid, and specific detection of DNA sequences and also provides a very unique and efficient way for handling biological samples. In addition, we explored the viability of using horizontally aligned ZnO nanonecklaces as surface enhanced Raman scattering (SERS) sensors. At last, we will report our recent findings on ceramic (such as SiC nanofibers) reinforced polymer nanocomposites and the critical influence of surface/interface engineering on nanocomposite mechanical properties.

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**Dr. Hao Li** received his B.E. and M.E. degree in Materials Science and Engineering at Xi'an Jiaotong University (China) and Ph.D. under Professor Woo Yong Lee in Materials Science and Engineering at Stevens Institute of Technology (New Jersey) in 2003. Upon graduation, he joined Brown University, as a postdoctoral research associate. In 2005, Dr. Li joined University of Missouri at Columbia (MU) as an assistant professor in the Mechanical & Aerospace Engineering department and he also holds a joint position in the Biological Engineering department. Dr. Li's current research focuses on synthesis, characterization, and application of novel nanostructured materials and biomedical materials with advanced properties. The medical applications being explored in Dr. Li's lab includes dentistry, orthopedics, cardiovascular, and diagnostics. Since he joined University of Missouri in 2005, Dr. Li has secured 8 federal grants in the general field of nanotechnology and biomaterials, primarily from NSF, NIH, and the EPA. Dr. Li published 26 journal papers and 1 book chapter. Dr. Li received NSF Career Award in 2009. Dr. Li is also very active in entrepreneurial activities and he received Rising Star of Entrepreneurship and Innovation with recognition from both Senate and House of Representatives, State of the Missouri, in 2008.

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