

Chemical & Biological Engineering Seminar

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When Biomolecules Meet Synthetic Materials: New Tools for Non-invasive Diagnosis and Therapeutics

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Abstract:

Our humans suffer from various diseases. The diagnostic and therapeutic procedures of some serious diseases (e.g. cancer) are painful and inefficient. Biomolecules (e.g. nucleic acids and proteins) play indispensable (either positive or negative) roles in the biological processes of these diseases. Therefore, selective isolation and detection of the interested biomolecular information can help us to diagnose the disease promptly, while transportation of bioactive biomolecules to target tissue and cells has tremendous impacts on the development of more efficient therapeutic strategies. Although promising, implantation of these ideas is limited due to lack of tools. With the rapid development of materials science and nanotechnology, synthetic materials have been attracted increasing attention and applied in biomedicine. Development of new biofunctional materials is dependent on the understanding of how synthetic materials interact with the biological systems. I seek to understand the synthetic materials/biomolecules interactions to create new biomedical tools for non-invasive diagnosis and therapeutics. My talk will show my efforts on 1) the development of affinity nanoprobe for isolation and detection of phosphoproteins and extracellular vesicles from human blood; and 2) the construction of novel biomimetic nanosystems for protein delivery and therapeutics.

Bio:

Dr. Gong Cheng is a Research Associate at Rowland Institute at Harvard University. He received his Ph.D. degree in chemistry from University of Chinese Academy of Science in 2013. After graduation, he worked as a postdoctoral scholar in the department of biomedical engineering at the Pennsylvania State University before he moved to Harvard in 2017. His research interests lie at the intersection of materials science, chemical and biological engineering, with a major focus on biomaterials and their application in biotechnology and biomedicine.

