

BIOEN 509 – DEPARTMENTAL SEMINAR SERIES

Thursday, April 28 2011, 12:30-1:20 PM

Foege Bioengineering Building N130A

Biomaterial Engineering the Immune System

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Our research interfaces nanomaterials, the immune system and the engineering design. We use materials with defined properties to probe how the immune system interacts with synthetic materials at both cellular and molecular levels. Built upon our understandings, we design biomaterials to exploit intracellular pathways of immune cells for safe and effective therapeutics, such as tissue implants, non-viral gene delivery systems and vaccines. These biomaterials also provide an excellent tool for us to further dissect the cellular and molecular mechanisms by which immune responses are triggered and sustained. A challenge of current vaccines is to achieve a spectrum of immune responses in a single construct. In this talk, I will mainly discuss how we bring together the aforementioned research interests to address this challenge.

Dr. Shen is an assistant professor at Chemical Engineering Department at University of Washington. She received her B.S. degree from the Department of Chemical Engineering in Tsinghua University in China in 1995. At that time, any research was interesting to her. She joined a laboratory to design a process for purifying oily water. Though the process she designed was adapted by oil industries in China, she somehow lost her interest in traditional chemical engineering. After she obtained her M. S. in Tsinghua University in 1998, she left China and started her adventure at Cornell University under the supervision of Mark Saltzman. There, she worked on various types of biomaterials for DNA delivery and investigated migration of cells and macromolecules. Since then, she has been fascinated with the field of immunology. After she obtained her Ph. D. at Cornell University in 2004, she joined Dr. Iwasaki's laboratory at the Department of Immunology at Yale School of Medicine. In 2006, she joined the Department of Chemical Engineering at UW. She was awarded NSF Career award and NIH grants for her work in probing and engineering the immune responses with synthetic materials.

