



BIOENGINEERING

UNIVERSITY of WASHINGTON

A Department of the College of Engineering & School of Medicine

BIOEN 509 – DEPARTMENTAL SEMINAR SERIES

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12:30-1:20 PM

Foege Bioengineering Building N130A

Smart Nanobiomaterials for siRNA Delivery and Molecular Imaging *Dr. Tae Gwan Park*

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A variety of novel nano-biomaterials, such as polymeric micelles, nanoparticles, and microparticles, have been studied for drug delivery, tissue engineering, and gene therapy. A number of biodegradable polymers and smart hydrogels containing bioactive molecules including therapeutic protein drugs have been utilized for achieving sustained release and target-specific delivery. Self-assembled nano-scale particulates and micelles tagged with a cancer-targeting moiety on the surface were produced for actively targeting tumor cells. Recently, various novel inorganic/organic hybrid materials were synthesized for efficient intracellular delivery of antisense ODN, siRNA, magnetic nanoparticles, and optical imaging agents into cells. We are particularly interested in self-assembled bio-mimetic nano-biomaterials useful for therapeutic and diagnostic applications. Synthetic polymers and biomolecules (peptides, proteins, and nucleic acids) have been physically and chemically hybridized to create novel functional biomaterials. In this presentation, a series of new target-specific strategies for delivering anti-sense oligonucleotides, therapeutic siRNA, and imaging agents will be mainly introduced.

Professor Tae Gwan Park received B.S. in chemical engineering from Seoul National University in 1980, M.S. in biological sciences from Korea Advanced Institute of Science and Technology in 1983, and Ph.D. in bioengineering from the University of Washington in 1990 under the direction of Prof. Allan S. Hoffman. Following a postdoc research associate experience (1990-1991) at the Massachusetts Institute of Technology in Prof. Robert Langer lab, he joined Temple University, School of Pharmacy as an assistant professor. In 1995, he returned to Korea and became a professor at the Korea Advanced Institute of Science and Technology. He received numerous awards: New Faculty Development Award from the Parenteral Drug Association, USA (1992), New Faculty Award from the Whitaker Foundation, USA (1993), Seoam Scholar Award, Korea (2002), Soodang Award, Korea (2002), Nanotechnology Innovative Research Award, Korea (2006), KAIST Research Award, Korea (2007), Clemson Award for Contributions to Literature from the Society for Biomaterials, USA (2009), and Samsung Polymer Award (2010). His research interests include nanobiomaterials based drug delivery systems, gene therapy, and tissue engineering. He published over 223 papers in peer reviewed SCI journals, 30 domestic and foreign patents, and several book chapters. He commercialized PLGA scaffolds (Innopool-D[®]) for soft tissue engineering and licensed out several protein and gene delivery technologies. He currently serves as an editorial board member of Bioconjugate Chemistry, Journal of Controlled Release, Pharmaceutical Research, Macromolecular Bioscience, Journal of Bioactive and Compatible Polymers, Biomacromolecules, and Nano Today.



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