"BNC Seminar"

March 14th, 2016 @ 10:00am

BRK, ROOM 1001

Omid Veiseh

Postdoctoral Fellow, Massachusetts Institute of Technology

Title: Engineering Advanced Biomaterials: From contrast agents for brain tumor imaging to superbiocompatible hydrogels for pancreatic islet cell immunoisolation

Bio: Dr. Omid Veiseh is a Postdoctoral Fellow at the Massachusetts Institute of Technology. Working in the laboratories of Institute Professor Robert Langer and Professor Daniel G. Anderson, his research is aimed at developing immune modulatory biomaterials for cell-based therapies. He obtained his Bachelors of Science degree in Cell Biology from Western Washington University, and a Dual Ph.D. in Materials Science & Engineering and Nanotechnology from the University of Washington. Dr. Veiseh has contributed to more than 45 peer-reviewed publications, including those in Nature Biotechnology, Nature Materials, Nature Medicine, and Nature Reviews Drug Discovery. He is an inventor on 12 pending or awarded patents and three separate biotechnology companies have licensed technologies invented by Dr. Veiseh for commercialization. Throughout his career, he has received numerous awards and fellowships including: NSF Integrative Graduate Education and Research Training (IGERT) Fellowship, NIH T32 Ruth L. Kirschstein National Research Service Award Postdoctoral Fellowship, Juvenile Diabetes Research Foundation Postdoctoral Fellowship, DOD/CDMRP Breast Cancer Research Program Postdoctoral Fellowship, and DOD/CDMRP Visionary Postdoctoral Fellowship, and most recently, a Young Investigator Award from the Arthritis National Research Foundation (ANRF).

Abstract: The first part of my talk will focus on work completed during my Ph.D. aimed at the development of multifunctional nanoparticles to aid in the diagnosis and treatment of brain tumors. Biological barriers continue to limit access of therapeutics and contrast agents to brain tumor cells. To overcome these limitations, we developed tumor-specific, optical/MR imaging nanoparticles, which were able to transverse biological barriers and aid in the diagnosis, staging, and resection of brain tumors. The second part of my talk will focus on our ongoing efforts at MIT aimed at advancing technologies geared towards the engineering of a bioartificial pancreas for the treatment of patients afflicted with Juvenile Diabetes (Type 1). Type 1 diabetes is triggered by T-cell mediated destruction of insulin producing β-cells localized in the pancreas. Exogenous cell therapy, in the form of islet transplantation, has been intensely investigated as a method to restore glycemic control. However, due to host rejection of transplanted cells and the lack of biocompatible encapsulation materials, its widespread clinical application has been limited. Our efforts have been two-fold, focused on both understanding the mechanism by which current encapsulation materials become rejected and innovating novel immune modulatory biomaterials that can mediate foreign body reactions and fibrosis. In my talk, I will describe the various influential parameters we have discovered to be critical to the effective design and fabrication of hydrogel materials for long-term protection of therapeutic cells.

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