Stephenson School of Biomedical Engineering Seminar Series
Presents

Enabling High Precision Cancer Therapy with Engineered Nanoparticles

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1:30 P.M.
Rawl Engineering Practice Facility, Room 200

The past several decades have witnessed an explosive growth in our knowledge of cancer biology, which has led to improved treatment strategies. Despite these advances, however, most conventional treatments are still limited by insufficient results and off-target toxicity. There is an urgent clinical need for innovative technological platforms that enable high precision, tumor-specific therapy. Towards this goal, my research focuses on developing engineered nanoparticles that have unique physical and chemical properties that enable them to be implemented as tools to transform the treatment of cancer. In this presentation, I will describe different engineered nanoparticles that I have created and demonstrate their potential in treating aggressive forms of cancer. Specifically, I will show how the core structure and surface layer of these nanoparticles can be modified to enable them to act as photothermal therapeutics or gene regulatory agents. These materials have been evaluated both *in vitro* and *in vivo* against aggressive breast and brain cancers and have greatly reduced tumor growth resulting in improved survival, supporting the continued development and application of these nanoparticles for management of cancer.

Emily Day obtained her B.S. in Physics with a Minor in Mathematics from the University of Oklahoma in 2006, graduating s*umma cum laude*. Emily was recipient of the Carl Albert Award, which is given to the top senior in the College of Arts and Sciences based on academics, moral force of character and promise of future service to the state and nation. She then moved to Rice University to pursue a Ph.D. in Bioengineering under the guidance of Jennifer West. There, her research focused on developing nanoparticle-based photothermal therapy for the treatment of glioblastoma multiforme, which is the most aggressive and lethal form of primary brain tumor. During her time at Rice University, Emily received a National Science Foundation Graduate Research Fellowship, a Rice President's Graduate Fellowship, and was also named a Howard Hughes Medical Institute Med-Into-Grad Fellow. Upon completing her Ph.D. in 2011, Emily was awarded an International Institute for Nanotechnology postdoctoral fellowship and joined the laboratory of Chad Mirkin at Northwestern University, where her research focused on developing small interfering RNA-gold nanoparticle conjugates known as spherical nucleic acids to treat glioblastoma multiforme through gene regulation. Emily also received a National Institutes of Health F32 Ruth L. Kirschstein National Research Service Award during her time at Northwestern University. Emily joined the faculty in the Department of Biomedical Engineering at the University of Delaware in 2013. Her research builds upon the theme of engineering nanoparticles for management of disease developed during her graduate and postdoctoral work.

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