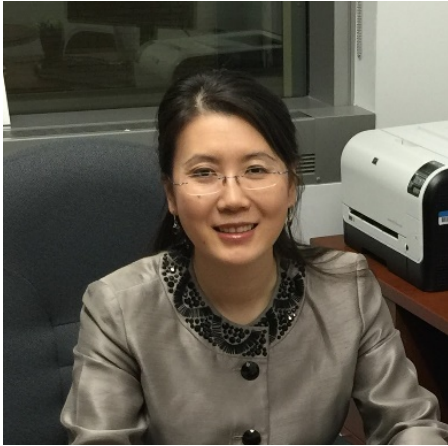


Stephenson School of Biomedical Engineering Seminar Series
Presents

**Integrating 3D Bioprinting and Nanomaterials for
Complex Tissue Regeneration**



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**Friday, October 28, 2016
1:30 P.M.
Oklahoma Memorial Union,
Associates Room (310C)**

As an emerging tissue manufacturing technique, 3D bioprinting offers great precision and control of the internal architecture and outer shape of a scaffold, allowing for close recapitulation of complicated structures found in biological tissue. Cells within the human body are in intimate contact with a 3D nanostructured extracellular matrix composed of numerous organic and inorganic components. However, current 3D bioprinting techniques exhibit difficulty in achieving a nano resolution for clinically relevant constructs. Therefore, the main objective of our research is to develop novel biologically inspired nanomaterials and advanced 3D bioprinting techniques to fabricate the next generation of biomimetic complex tissue constructs (such as vascularized tissue, osteochondral tissue and neural tissue). For this purpose, we designed and synthesized innovative biologically inspired nanomaterials (i.e., smart self-assembly materials, conductive carbon nanomaterials, biocompatible nano hydroxyapatites, and bioactive factor loaded core-shell nanospheres). Through 3D bioprinting in our lab, a series of biomimetic tissue scaffolds with nano and micro features were successfully fabricated. Our results show that these 3D bioprinted nano scaffolds have not only improved mechanical properties but also excellent cytocompatibility properties for enhancing various cell growth and differentiation, thus promising for complex tissue regeneration.