

# GRADUATE SEMINAR SERIES

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## **Biomaterials for Drug Delivery and Cell Transplantation to Treat Nerve Injury**

**Dr. Shelly Sakiyama-Elbert**  
**The University of Texas at Austin**

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**Monday, November 18, 2019**

Reception 3:30-4:00 p.m. | NANOENGINEERING 181

Lecture 4:00-5:00 p.m. | NANOENGINEERING 181

### **Abstract**

The development of biomaterials to serve as scaffolds for wound healing and tissue repair is crucial for successful tissue engineering. My research focuses on developing biomaterials that promote cell survival and/or differentiation after transplantation for the treatment of nerve injury. My lab has developed heparin-binding affinity-based drug delivery systems that sequester growth factors within scaffolds and release growth factors in response to cell in-growth during tissue regeneration. More recently we have combined these scaffolds with embryonic stem cell-derived neural progenitor cells and shown that the combination of fibrin scaffolds and growth factor delivery can enhance cell survival and differentiation of neural progenitor cells transplanted after spinal cord injury. Furthermore, we demonstrated this approach enhanced functional recovery after spinal cord injury, as assessed by gridwalk. In conclusion, fibrin scaffold containing our drug delivery system can serve as a platform for cell transplantation for many applications in regenerative medicine by tailoring the choice of growth factors and the cell type used.

## Bio



Shelly E. Sakiyama-Elbert, Ph.D., is Department Chair of Biomedical Engineering and the Fletcher Stuckey Pratt Chair in Engineering at the University of Texas at Austin. Her research focuses on developing biomaterials for drug delivery and cell transplantation for the treatment of peripheral nerve and spinal cord injury. Dr. Sakiyama-Elbert is funded by the NINDS & NIAMS (NIH), and previously she received early career awards from the Whitaker Foundation and the WH Coulter Foundation. Her honors include the Fellow of the National Academy of Inventors, Society for Biomaterials Clemson Award for Basic Research (2017), WU Distinguished Faculty Award and Outstanding Faculty Mentor from the WU

Graduate Student Senate. She is a Fellow of the American Institute for Medical and Biological Engineering, the Biomedical Engineering Society (BMES), the American Association for the Advancement of Science (AAAS), and the International College of Fellows in Biomaterials Science and Engineering. Her other professional service includes serving as an Associate Editor for Biotechnology and Bioengineering and the Journal of Biomedical Materials Research Part A, a member of the Editorial Board of Acta Biomaterialia, and serving as a standing member of the Biomaterials/ Biointerfaces (BMBI) NIH study section (2010- 2013). She served as Chair for the 2013 Gordon Research Conference on Biomaterials & Tissue Engineering and the 2017 BMES Annual Meeting. She is currently the President-Elect for the Society for Biomaterials, and previously she served as the Secretary/Treasurer of the Society for Biomaterials, on the Board of Directors for the BMES and the Americas Council for the Tissue Engineering and Regenerative Medicine International Society (TERMIS).