

**Millicent Sullivan****Centennial
Associate Professor of
Chemical and
Biomolecular Engineering****University of Delaware
Newark, DE****Thursday,****March 29, 2018****11:00 a.m.****171 Durham Center****Iowa State University**

Unlocking Intracellular Therapeutic Targets Using Bioinspired Materials

Our group addresses challenges in drug and gene delivery by coupling principles in molecular design, molecular self-assembly, and chemical reaction kinetics with principles of cell and extracellular matrix (ECM) biology and the cell-material interface. In particular, soft materials (e.g. polymers and peptides) exhibit enormous chemical and mechanical tunability and have been self-assembled by our group and others into a versatile array of gene and drug-loaded nanostructures. We are particularly interested in developing nature-inspired approaches to harness native gene delivery and regulation mechanisms, and to actively control self-assembly vs. disassembly in gene and drug-loaded structures. This talk will highlight ways in which our laboratory has developed and use nanoscale materials to understand and probe cellular "unit ops," with long-term applications including targeted drug delivery for prostate and breast cancer, and gene therapy for wound and tissue repair.

Millicent Sullivan is the Centennial Associate Professor of Chemical & Biomolecular Engineering at the University of Delaware. Sullivan graduated from Princeton University with a B.S.E. degree in Chemical Engineering and a Certificate in Engineering Biology in 1998. Subsequently, she attended Carnegie Mellon University as a Clare Boothe Luce Graduate Fellow, where she earned her Ph.D. degree in Chemical Engineering with Professor Todd Przybycien in 2003. As a Ruth L. Kirchstein NIH postdoctoral fellow, Sullivan worked with Professor E. Helene Sage in the Matrix Biology/Hope Heart Program of the Benaroya Research Institute. In 2006, Sullivan moved to the University of Delaware. Her laboratory develops new biomaterials for drug delivery, gene delivery, and tissue engineering, with specific therapeutic targets including metastatic breast cancer, bone repair, wound healing, and cardiovascular repair. Specific fundamental foci include *de novo* peptide design, peptide and polymer self-assembly, and subcellular processing mechanisms. Sullivan is a faculty member in the Delaware Biomaterials COBRE, a member of the Penn Center for Targeted Therapeutics and Translational Nanomedicine (CT³N), an Affiliate Member of the Delaware Biotechnology Institute, and an Affiliate Faculty in the Department of Biomedical Engineering at UD. She was selected as an AIMBE fellow in 2017, named as a Georgia Tech Frontiers in Bioengineering Young Investigator in 2013, selected as the Outstanding Junior Faculty in Engineering at UD in 2011, and has received various other awards including the NSF CAREER Award and a Merck Faculty Fellow Award.

The Graduate Seminar Series events are part of the required curriculum for chemical engineering graduate students, but open to all Iowa State University graduate students, post-doctoral researchers, scientists, faculty and staff. See the full seminar schedule at cbe.iastate.edu/semnar-series/