

CHEMICAL ENGINEERING

SEMINAR SERIES



COLE A. DEFOREST

Monday, April 29, 2019

Assistant Professor, UW Chemical Engineering
Department of Bioengineering
Institute for Stem Cell and Regenerative Medicine
Molecular Engineering & Sciences Institute

User-Programmable Hydrogel Biomaterials to Probe and Direct 4D Stem Cell Fate

ABSTRACT: The extracellular matrix directs stem cell function through a complex choreography of biomacromolecular interactions in a tissue-dependent manner. Far from static, this hierarchical milieu of biochemical and biophysical cues presented within the native cellular niche is both spatially complex and ever changing. As these pericellular reconfigurations are vital for tissue morphogenesis, disease regulation, and healing, *in vitro* culture platforms that recapitulate such dynamic environmental phenomena would be invaluable for fundamental studies in stem cell biology, as well as in the eventual engineering of functional human tissue. In this talk, I will discuss some of our group's recent success in reversibly modifying both the chemical and physical aspects of synthetic cell culture platforms with user-defined spatiotemporal control. Results will highlight our ability to modulate intricate cellular behavior including stem cell differentiation, protein secretion, and cell-cell interactions in 4D.

BIOGRAPHY: Dr. Cole A. DeForest is the Dan Evans Career Development Assistant Professor in the Department of Chemical Engineering, an Assistant Professor in the Department of Bioengineering, and a core faculty member of the Institute for Stem Cell & Regenerative Medicine at the University of Washington (UW) where he began in 2014. He received his B.S.E. degree from Princeton University in 2006, majoring in Chemical Engineering and minoring in Material Science Engineering and Bioengineering. He earned his Ph.D. degree under the guidance of Dr. Kristi Anseth from the University of Colorado in Chemical and Biological Engineering with an additional certificate in Molecular Biophysics.,

LECTURE 4:00 – 5:00pm | PAA A-114
RECEPTION 3:30 | PAA LOBBY

W CHEMICAL ENGINEERING
UNIVERSITY of WASHINGTON
Knowledge and solutions for a changing world

CHEMICAL ENGINEERING

SEMINAR SERIES

His postdoctoral research was performed with Dr. David Tirrell in the Divisions of Chemistry and Chemical Engineering at the California Institute of Technology. He has authored ~40 peer-reviewed articles, including as the corresponding author for those appearing in Nature Materials, Nature Chemistry, Advanced Materials, and Nature Reviews Materials. Dr. DeForest has received numerous research awards and honors including the Safeway Early Career Award (2018), NSF CAREER Award (2017), AIChE 35-Under-35 Award (2017), ACS PMSE Young Investigator Award (2017), Jaconette L. Tietze Young Scientist Award (2015), Biomedical Engineering Society Student Fellow Award (2013), DSM Polymer Technology Award (2011), ACS Excellence in Graduate Polymer Research Award (2010), MRS Graduate Student Research Gold Award (2009), Society for Biomaterials Outstanding Achievement Award (2009), Princeton University Material Science Student of the Year (2006), Princeton University Most Approachable Resident Adviser (2005), and Boulder High School Valedictorian (2002). Notably, he has also been recognized for excellence in teaching and was awarded the UW Presidential Distinguished Teaching Award (2016), given annually to a single Assistant Professor across all of the UW. His research has been supported through fellowships and grants from the National Science Foundation, the National Institutes of Health, and the US Department of Education.

LECTURE 4:00 – 5:00pm | PAA A-114
RECEPTION 3:30 | PAA LOBBY



CHEMICAL ENGINEERING

UNIVERSITY of WASHINGTON

Knowledge and solutions for a changing world