*Stephenson School of Biomedical Engineering*
*Seminar Series Presents*

# MATRIX BINDING NANOCARRIERS FOR MOLECULARLY TARGETED OSTEOARTHRITIS THERAPY


## DR. CRAIG DUVALL

Biomedical Engineering
Vanderbilt University


1:30 p.m., Wednesday, December 5, 2018
CEC Rm. 100

## BIO:

Dr. Duvall completed his Ph.D. in BME at Georgia Tech and Emory University under the direction of Bob Guldberg and Bob Taylor in 2007. He then joined the labs of Patrick Stayton and Allan Hoffman at the University of Washington for his NIH NRSA-funded postdoctoral fellowship. Based on these foundations, the Duvall Advanced Therapeutics Laboratory (ATL) was launched in the Vanderbilt Biomedical Engineering Department in 2010, and Dr. Duvall was promoted to Associate Professor in 2016. Dr. Duvall has won awards such as the PECASE, NSF CAREER Award, AHA Scientist Development Grant, Society for Biomaterials Young Investigator Award, BMES Cellular and Molecular Bioengineering Young Innovator Award, AIMBE Fellow, and standing membership on the Gene and Drug Delivery NIH Study Section. The ATL is funded by grants from the National Institutes of Health, Department of Defense Congressionally Directed Medical Research Program, and National Science Foundation.

## ABSTRACT:


The Duvall Advanced Therapeutics Laboratory (ATL) in the Department of Biomedical Engineer-ing at Vanderbilt University (Nashville, Tennessee, USA) specializes in design and application of smart polymer-based technologies for: (1) intracellular delivery of biological drugs such as peptides and nucleic acids, (2) proximity-activated targeting of drugs to sites of inflammation and matrix remodeling, and (3) long-term, "on-demand" drug release from localized depots. These delivery systems are designed to improve the therapeutic index of existing drugs and/or to serve as enabling technologies for manipulation of intracellular targets currently considered to be "undruggable". To achieve optimal, finely-tuned therapeutic properties, polymers are utilized that respond to one or more environmental stimuli including pH, matrix metalloproteinases, reactive oxygen species, and temperature. This talk will focus on our recent innovation of molecularly-tar-geted RNAi therapies for biomechanical overload-induced osteoarthritis.


GALLOGLY COLLEGE OF ENGINEERING
STEPHENSON SCHOOL
OF BIOMEDICAL ENGINEERING
*The* UNIVERSITY *of* OKLAHOMA