Stephenson School of Biomedical Engineering
Seminar Series Presents

EMULSION ELECTROSPUN FIBERS FOR SEX-DEPENDENT FIBROCARTILAGE REGENERATION

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1:30 p.m.
Friday, June 14, 2019
Carson Engineering Center, Room 100

BIO:

Dr. Jenny Robinson is an Assistant Professor in Chemical Engineering and the Bioengineering Graduate Program at the University of Kansas. Jenny received her B.S. in Bioengineering from Rice University, Ph.D. in Biomedical Engineering from Texas A&M University and conducted postdoctoral research in Biomedical Engineering and Craniofacial Biology at Columbia University. Her research has been recognized by a Whitaker Fellowship, NSF Graduate Research Fellowship, PEO Scholar Award, NIH NIDCR K12 Training Grant, a NIH F32 Ruth L. Kirschstein National Research Service Postdoctoral Award, and a NIH NIGMS COBRE award.

ABSTRACT:

The Robinson Lab is interested in developing biomaterials for sex- and age-dependent tissue regeneration. Specifically, Dr. Robinson's Lab focuses on elucidating the role of sex hormones on musculoskeletal tissue homeostasis and disease and developing biomaterial scaffolds engineered to modulate cell response to sex hormones to promote regeneration. We have previously illustrated the role of estrogen via estrogen receptor alpha (ERα) on the temporomandibular joint condylar fibrocartilage of female mice. In skeletally immature mice, estrogen via ERα promoted mandibular condylar fibrocartilage chondrogenesis partly by inhibiting the canonical Wnt signaling pathway through upregulation of sclerostin (Sost). In skeletally mature mice, protease activity was partly inhibited with estrogen treatment via the upregulation and activity of protease inhibitor 15 (Pi15) and alpha-2-macroglobulin (A2m). While our group and others have reported anabolic effects of estrogen, the effects are dependent on concentration and kinetics. As such, Dr. Robinson's seminar will highlight her lab's focus on developing emulsion electrospun nanofibers with tunable release of estrogen receptor alpha agonists to promote new extracellular matrix production from TMJ condylar and knee meniscus fibrochondrocytes. Modulation of compositional, processing, and environmental parameters allows for control of both fiber diameter and surface and internal architectures – all of which dictate diffusional release rates. The overall goal of this research is to promote regeneration and homeostasis after injury to reduce the onset and severity of osteoarthritis.

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