**BME Seminar Series**

**Brian Diekman, PhD**  
Assistant Professor of Biomedical Engineering  
University of North Carolina

**Date:** Monday, November 4, 2019  
**Time:** 1:30 pm  
**Location:** Traylor 709  
No VTC to Clark 110

**Faculty Host:** Jennifer Elisseeff

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**Insight into Osteoarthritis Pathogenesis from Senescence Reporter Mice and Genome-edited Human Chondrocytes**

**Abstract:** Aging and Joint injury are a strong risk factors for the development of osteoarthritis (OA). In both settings, the secretion of catabolic factors by senescent cells may contribute to disease progression. The use of “senolytic” compounds to specifically target senescent cells for apoptosis has strong potential to mitigate OA, but there is a need for a better understanding of senescence induction and the efficiency of senolytic clearance in joint tissues. The use of \( p16^{tdTomato} \) reporter mice facilitates quantification of the senescence burden with single-cell resolution in both explant and in vivo settings. Genetic background is also a key driver of OA, but has studies (GWAS) onto novel therapies. To enable functional follow-up studies on known genetic variants, we developed a genome-editing workflow to generate robust engineering cartilage from edited primary human chondrocytes. By modeling specific genetic changes or introducing the homozygous knockout of target genes, this system will provide mechanistic insight into cellular and tissue changes associated with OA risk and pathogenesis.

**Bio** – Brian Diekman is an Assistant Professor of Biomedical Engineering in a joint department that spans both the University of North Carolina at Chapel Hill (UNC) and North Carolina State University. His research laboratory is housed within the Thurston Arthritis Research Center at UNC. After completing his undergraduate degree at Duke University, Brian worked with Drs. Mary Murphy and Frank Barry at the National University of Ireland Galway through a Fulbright research grant. Brian then received his PhD in Biomedical Engineering at Duke University, with his graduate work focusing on cartilage tissue engineering in the laboratory of Dr. Farshid Guilak. Dr. Diekman completed post-doctoral research in the fields of cellular senescence and aging biology at UNC with Dr. Normal “Ned” Sharpless in the UNC Lineberger Comprehensive Cancer Center. He launched his research laboratory in 2017 and the lab has received funding from the Arthritis National Research Foundation and the American Federation of Aging Research.