

# **BIOENGINEERING SEMINAR: LESSONS LEARNED IN A DECADE OF PRINTING CARTILAGE**

## **Spring 2018 Seminar**

**Location:**  
**Research Hall 163**

**Date:**  
**Thursday, April 12, 2018**

**Time:**  
**12:00 pm - 1:00pm**

**Topic:** While tissue engineering holds great promise for clinical reconstruction of cartilage for a variety of applications, a great challenge in tissue engineering is the reliable and scalable generation of tissues that match the desired anatomy and reproduce the microstructure of the tissue that ensures proper function. Over the past decade our lab has developed an array of platform technologies for co-processing cells and biomaterials to enable larger scale and standardized methods for generating engineered cartilage. These processes includes tissue injection molding, tissue sintering, living lithography, and 3D tissue printing technologies, with target applications ranging from articular cartilage, ear cartilage, trachea, meniscus, and intervertebral disc. The focus of this seminar is detailing the development of these processes with particular focus on the critical role that biomaterials play in tissue engineering via rapid prototyping. The talk will also discuss interfacing this tissue production technology with bioreactors for mechanical conditioning and present in vivo studies of the efficacy of these engineered tissues.



**Lawrence J. Bonassar,  
PhD**

**Biography:** Dr. Bonassar is a professor in the Meinig School of Biomedical Engineering and the Sibley School of Mechanical and Aerospace Engineering at Cornell University. He received his bachelor's degree from the Departments of Biomedical Engineering and Materials Science and Engineering from the Johns Hopkins University.

He received both his masters and doctoral degrees from the Department of Materials Science and Engineering at MIT. He completed postdoctoral training in the Department of Orthopedic Surgery at Massachusetts General Hospital. He was an Assistant Professor in the Center for Tissue Engineering at University of Massachusetts Medical School prior to joining the faculty at Cornell.

Dr. Bonassar has authored more than 200 peer-reviewed manuscripts that have been cited more than 10,000 times and is an inventor on 11 patents. He has served in the editorial boards for *Tissue Engineering, Parts A, B, and C, International Journal of Biomaterials, and 3D Printing and Additive Manufacturing*. He has won several national and international awards including the Hansjorg Wyss Research Award at the World Forum for Spine Research and the 2013 World Technology Award in Health and Medicine.

Dr. Bonassar's research focuses on cartilage biomechanics and tissue engineering. His work is aimed at understanding structure-property relationships in cartilage to elucidate mechanisms of disease and inform design of tissue replacements. His research focusing on tissue regeneration includes the development of tissue injection molding and 3D tissue printing aimed at scale-up and manufacturing of high fidelity living implants design based on medical imaging. His work on regenerative medicine has been featured in the Health and Science Section of the *Washington Post*, National Geographic's *Explorers*, BBC's *Horizons*, CBC's *The Nature of Things*, CBS's *Sunday Morning*, and CNN's *Fareed Zakaria GPS*.