



DEPARTMENT OF BIOMEDICAL ENGINEERING

# 2021 SEMINAR SERIES

## LORI A. SETTON, Ph.D.

Lucy and Stanley Lopata  
Distinguished Professor & Chair of  
Biomedical Engineering  
*Washington University in St. Louis*

**11/19/2021**

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Passcode: 2010

**10:30 AM EST**

### ABSTRACT:

## *NAVIGATING A PATH TO UNDERSTANDING DRUG DELIVERY IN THE TREATMENT OF ARTHRITIS*

Research and development have advanced clinical use of protein and small molecule drugs that can modify the progression and symptoms of osteoarthritis and inflammatory pain, including mediators of TNF-alpha and the NF-kappa B pathway. Systemic administration of these drugs can have serious side effects that motivate use of local drug delivery strategies, such as intra-articular injection, to prolong drug residence time and decrease serum exposure. Our laboratory both develops in situ forming drug depots for sustained drug delivery to the joint over time and constructs computational models of drug clearance to understand governing processes. Here we will review the synthesis and design of intra-articular drug depots, and show evidence that drugs retain substantial bioactivity and disease-modifying effects in vivo. We further describe our ex vivo models to advance an understanding of factors affecting drug transport in the joint space towards the goal to design optimal drug delivery strategies.

### BIOGRAPHY:

Dr. Setton received her B.S.E. from Princeton University and M.S. and Ph.D. degrees in Mechanical Engineering from Columbia University. Dr. Setton joined the Department of Biomedical Engineering at Duke University in 1994, where she served as the Bevan Professor of Biomedical Engineering and Orthopaedic Surgery. In 2015, Dr. Setton joined the Department of Biomedical Engineering at Washington University and holds the position of Lopata Professor & Chair of Biomedical Engineering.

Dr. Setton's research has focused on understanding mechanisms that control drug delivery and tissue regeneration in the knee joints and spine. She has funded her lab through grants from the NIH, NSF, Whitaker Foundation, Coulter Foundation, OREF, AO Foundation, and research agreements with several corporations.

Dr. Setton is a Fellow of the BMES, ASME, and AIMBE, has served as President of the Biomedical Engineering Society, and received a PECASE Award, Dean's Award for Outstanding Research, Graduate Dean's Award for Excellence in Mentoring, and ASME's Mow Medal.



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