

# PAGE MORTON HUNTER DISTINGUISHED SEMINAR SERIES



## Passive and Active Spinal Stabilizers: Influence on Chronic Low Back Pain

Chronic low back pain (cLBP) is a complex, multifaceted disorder where biological, psychological, and social factors affect its onset and trajectory. Consequently, the diagnostic label 'cLBP' encompasses many different disease variants, with multiple patient-specific pathophysiological mechanisms. To improve mechanistic insights for improving diagnostic and therapeutic approaches, we have studying structural spinal stability and using a range of model systems that include cell culture, small and large animals, and clinical cohorts that include NASA astronauts. Results from these studies indicate the importance of crosstalk (physical and biological) between spinal tissues that provide structural stability: intervertebral discs, vertebral bodies, and paraspinal muscles.

This presentation will review these data and how they integrate with the NIH Back Pain Consortium (BACPAC), which is a multi-site and multi-component consortium of research initiatives administered by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). BACPAC intends to identify the root mechanisms of chronic low back pain, examine why some treatments work differently in different patient populations, and test innovative approaches to cLBP through cohort studies and clinical trials.

### Jeffrey Lotz, Ph.D.



*David S. Bradford, M.D. Endowed  
Chair in Orthopaedic Surgery and Vice  
Chair of Orthopaedic Research, UCSF*

Dr. Lotz has led the Orthopaedic Tissue Engineering Laboratory at UCSF since 1992. He is principal investigator of one of the three Mechanistic Research Centers funded through the NIH Back Pain Consortium (BACPAC) Research Program (under NIH HEAL). BACPAC is a translational, patient-centered effort to address the need for effective and personalized therapies for chronic low back pain. Dr. Lotz is also director of three other research centers, including the NIDCR-funded Center for Dental, Oral and Craniofacial Tissue and Organ Regeneration (C-DOCTOR); the NIH-funded Core Center for Musculoskeletal Biology in Medicine (CCMBM); and the NSF-funded Industry/University Cooperative Research Center (CDMI). Dr. Lotz has expertise in spine biomechanics, intervertebral disc biology, and tissue engineering, and his laboratory work focuses on identifying mechanisms of disc degeneration, developing novel diagnostics and therapies for low back pain, and the biomechanics of spinal instrumentation. Dr. Lotz earned a doctorate degree in Medical Engineering from the Harvard/MIT Division of Health Sciences and Technology, a Master Degree in Mechanical Engineering Design from Stanford University, and Bachelor of Science in Mechanical Engineering from UC Berkeley.

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*Virtual seminar*

<https://clemson.zoom.us/j/99002639746>



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