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.