

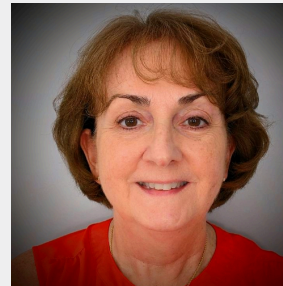
PAGE MORTON HUNTER DISTINGUISHED SEMINAR SERIES



UNDERSTANDING MOTOR RECOVERY AND CIRCUITRY SUBSTRATES IN A LARGE ANIMAL MODEL OF SPINAL CORD INJURY

Spinal cord injury leads to motor weakness and/or paralysis below the level of the lesion. Most human injuries, even if defined as clinically complete, have residual fibers spanning the injury site. These fibers present opportunities as therapeutic targets. Models of incomplete injuries allow us to probe the potential for plasticity of spared substrates as well as to assess recovery of specific motor contributions across multiple levels of the neuraxis, from primary motor cortex to spinal reflex. Despite evidence of notable spinal plasticity across species from our lab and others, motor deficits persist even following incomplete injuries. Our work suggests that while some motor disruptions, such as loss of targeted limb placements, may result from direct damage of descending motor control pathways at the lesion site, others may not. Basic and reflex functions with intact circuitry distant to a lesion may show fundamental alterations, suggesting the loss of critical modulatory influence(s). We have evidence that this is true across diverse motor systems including limb weight acceptance and swallow. Understanding the specific features and mechanisms of motor disruption, along with the use of clinically relevant assessments and approaches, are critical for the development of new therapeutic approaches, and refinement of existing, evidence-based rehabilitation.

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Dena Howland received her BS from Ohio State University (Columbus, OH) and initially practiced as an Occupational Therapist in a rehabilitation setting for individuals with spinal cord and head injuries. She then trained in Spinal Cord Injury Research and Intraspinal Transplantation at the Medical College of Pennsylvania (now known as Drexel College of Medicine) with the late Dr. Michael Goldberger and received her PhD in Anatomy and Neurobiology. After a post-doctoral fellowship at the University of Florida (Gainesville, FL) in the Department of Neuroscience working with Dr. Douglas Anderson, she obtained her first faculty position in the same department. In 2012, she moved to the Kentucky Spinal Cord Injury Research Center at the University of Louisville where she is Professor in Neurological Surgery and holds the Rebecca F. Hammond Chair in Spinal Cord Injury Research. Her research group focuses on understanding the impact of spinal cord injury on motor function and its underlying circuitry, and identification of approaches to enhance recovery and plasticity. Her published works include animal models and human subject research.

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