CURRICULUM VITAE
THOMAS (GEORGE) HORNBY

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PRESENT POSITIONS

Associate Professor, Department of Physical Therapy and Department of Kinesiology and Nutrition, University of Illinois at Chicago

Adjunct Research Associate Professor, Department of Physical Medicine and Rehabilitation, Northwestern University Feinberg School of Medicine

Research Scientist/Director, Locomotor Recovery Laboratory, Sensory Motor Performance Program, Rehabilitation Institute of Chicago, Chicago, IL

EDUCATION

University of Arizona	PhD	Physiological Sciences	2000
University of Pittsburgh	MPT	Physical Therapy	2000
University of California, Los Angeles	BS	Physiological Sciences	1992

PROFESSIONAL LICENSE

Physical Therapist, State of Illinois, Department of Financial and Professional Regulation, Division of Professional Regulation, License No. 070-012426.

PROFESSIONAL EXPERIENCE

Department of Physical Therapy, University of Illinois, Chicago, IL
- Associate Professor 08/09 - present
- Assistant Professor 8/03 – 8/09

Sensory Motor Performance Program, Rehabilitation Institute of Chicago, IL
- Research Scientist/Director: Locomotor Recovery Laboratory/Ability Lab 1/03 – present

Department of Physical Medicine and Rehabilitation, Northwestern University, Chicago, IL
- Adjunct Research Associate Professor 08/09 - present
- Adjunct Research Assistant Professor 1/03 – 8/09

Clinical Resource Department, Rehabilitation Institute of Chicago, Chicago, IL
- Physical Therapist (per diem) 2/01-present

Department of Physical Medicine and Rehabilitation, Northwestern University, Chicago, IL
- Post-doctoral fellow 7/00-12/02

Department of Physiology, University of Arizona, Tucson, AZ
- Graduate Research Assistant 8/93-8/00
- Graduate Teaching Assistant 8/94-5/98

PEER-REVIEWED PUBLICATIONS

Hornby TG, Echauz T, Heitz RD. Effects of selective serotonin reuptake inhibitors on volitional strength and spastic reflexes in human spinal cord injury. To *J Physiol*

Hornby TG, Kinnaird CK, Moore JL. Combined serotonergic agents and training improve locomotor function post-stroke. Submitted to Stroke.

Holleran, CL, Straube DD, Kinnaird CK, Leddy AL, **Hornby TG**. High intensity stepping training in variable contexts improves locomotor function in individuals post-stroke.. Submitted to Neurorehabil Neural Repair. 2012. In revision.

Gourab K, Schmit BD, Bogey RA, **Hornby TG**. Effects of selective serotonergic reuptake inhibitors on volitional and reflex function post-stroke. Submitted to *Clin Neurophysiol*

Courtney CA, O'Hearn MA, **Hornby TG**. Neuromuscular Function in Painful Knee Osteoarthritis. *Curr Pain Headache Rep.* Dec;16(6):518-24. 2012. PMID: 23054978

Thompson CK, Hornby TG. Divergent modulation of clinical measures of volitional and reflexive motor behaviors following serotonergic medication in human incomplete spinal cord injury. J Neurotrauma. 2012 In press. PMID: 22994901

O'Donnell LA, Straube DD, Rodriguez KS, **Hornby TG**. Concurrent Validity of the StepWatch Activity Monitor with Observational Counts of Stepping. 2011. Submitted to *Top Stroke Rehabil*

Hornby TG, Kinnaird CR, Holleran CL, Rodriguez KS, Rafferty MR, Cain JS. Kinematic, electromyographic, and metabolic responses during exoskeletal-, elliptical- or therapist-assisted stepping in incomplete spinal cord injury. *Phys Ther*.. 2012 92:1278-1291. PMID:22700537

Wu M, Landry J, Schmit BD, **Hornby TG**, Yen SC. Robotic resistance treadmill training improves locomotor function in human SCI: a pilot study. *Arch Phys Med Rehabil.* 2012. In press.

Hornby TG, Straube DS, Kinnaird CR, Holleran CL, Echauz AJ, Rodriguez KS, Wagner EJ, Narducci EA. Importance of Specificity, Amount and Intensity of Locomotor Training to Improve Ambulatory Function in Patients Post-stroke. *Top Stroke Rehabil.* 2011 Jul-Aug;18(4):293-307. PMID:21914594

Thompson CK, Lewek MD, Jayaraman A, **Hornby TG**. Central Excitability Contributes to Supramaximal Volitional Contractions in Human Incomplete Spinal Cord Injury. 2011. *J Physiol. Aug* PMID: 21610138

Thompson CK, Jayaraman A, Kinnaird CR, **Hornby TG**. Methods to quantify pharmacologically induced alterations in motor function in human incomplete SCI. *J Vis Exp*. 2011 Apr 18;(50). pii: 2148. doi: 10.3791/2148. PMID: 21525848

Frigon A, Thompson CK, Johnson MD, Manuel M, **Hornby TG**, Heckman CJ. Extra Forces Evoked during Electrical Stimulation of the Muscle or its Nerve Are Generated and Modulated by a Length-Dependent Intrinsic Property of Muscle in Humans and Cats. *J Neurosci.* 2011. 13;31(15):5579-88. PMID: 21490198

Theiss RD, **Hornby TG**, Rymer WZ, Schmit BD. Riluzole decreases flexion withdrawal reflex but not voluntary ankle torque in human chronic spinal cord injury. *J Neurophysiol.* 105(6):2781-90. PMID: 21430280

Wu M, **Hornby TG**, Landry JM, Roth H, Schmit BD. A cable-driven locomotor training system for restoration of gait in human SCI. *Gait Posture.* 2011. 33(2):256-60. PMID: 21232961

Hornby TG, Reinkensmeyer DJ, Chen D. Manually-assisted versus robotic-assisted body weight-supported treadmill training in spinal cord injury: what is the role of each? *PMR*. 2(3):214-6, 2010. PMID: 20359687

Moore JL, Roth EJ, Killian C, **Hornby TG**. Locomotor training improves the amount of daily stepping and gait efficiency in individuals post-stroke who have reached a plateau in recovery during conventional rehabilitation. *Stroke*.41(1):129-35, 2010. PMID: 19910547

Courtney CA, Witte PO, Chmell S, **Hornby TG.** Heightened flexor withdrawal response in individuals with knee osteoarthritis is modulated by joint compression and joint mobilization. *J Pain.* 11:179-185, 2010.

Saraf P, Rafferty MR, Kahn JH, Moore JL, Hendron K, Leech K, **Hornby TG.** Daily stepping in individuals with incomplete spinal cord injury. *Phys Ther*;90(2):224-35, 2010. PMID: 20022997, PMID: 19910547

Lang CE, MacDonald JR, Reisman DS, Boyd L, Kimberley TJ, Schindler-Ivens SM, **Hornby TG**, Ross SA, Scheets PL. Observation of amounts of movement practice provided during stroke rehabilitation. *Arch Phys Med Rehabil*, 2009. 90(10):1692-8.

Courtney CA, Lewek MD, Witte PO, Chmell S, **Hornby TG**. Increased flexor withdrawal reflex excitability in patients with knee osteoarthritis. *J Pain, 2009,* In press.

Cotey D, **Hornby TG**, Gordon KE, Schmit BD. Increases in muscle activity produced by vibration of the thigh muscles during locomotion in chronic human spinal cord injury. *Exp Brain Res.* 2009 May 29.

Lewek MD, Cruz TH, Moore JL, Roth HR, Dhaher YY, and **Hornby TG.** Allowing Intralimb Kinematic Variability During Locomotor Training Poststroke Improves Kinematic Consistency: A Subgroup Analysis From a Randomized Clinical Trial. *Phys Ther* 89: 829-839, 2009. PMID: 19520734

Hornby TG, Lewek MD, Thompson CK, and Heitz R. Repeated Maximal Volitional Effort Contractions in Human Spinal Cord Injury: Initial Torque Increases and Reduced Fatigue. *Neurorehabilitation and Neural Repair* 23: 928-938, 2009. PMID: 19478056

Kahn JH, **Hornby TG**. Rapid and long-term adaptations in gait symmetry following unilateral step training in people with hemiparesis. *Phys Ther.* 2009 May;89(5):474-83.

Wu M, Kahn JH, **Hornby TG**, Schmit BD**.** Rebound responses to prolonged flexor reflex stimuli in human spinal cord injury**.** *Exp Brain Res*. 2009 Feb;193(2):225-37

Hidler J, Nichols D, Pelliccio M, Brady K, Campbell DD, Kahn JH, **Hornby TG**. .Multicenter randomized clinical trial evaluating the effectiveness of the Lokomat in subacute stroke. *Neurorehabil Neural Repair*. 2009 Jan;23(1):5-13.

Hornby TG, Campbell DD, Kahn JH, Demott T, Moore JL, Roth HR. Enhanced gait-related improvements following therapist- vs. robotic-assisted locomotor training in subjects with chronic stroke: a randomized controlled study. *Stroke.* 2008. 39(6):1786-92.

Bogey RA, **Hornby GT**. Gait Training Strategies Utilized in Poststroke Rehabilitation: Are We Really Making a Difference? *Top Stroke Rehabil*. 2007 14(6):1-8.

Lewek MD, **Hornby TG**, Dhaher YY, Schmit BD. Prolonged Quadriceps Activity Following Imposed Hip Extension: A Neurophysiological Mechanism for Stiff-Knee Gait? *J Neurophysiol*. 2007. Dec;98(6):3153-62.

Stauffer EK, McDonagh JC, **Hornby TG**, Reinking RM, Stuart DG. Historical reflections on the after-hyperpolarization-firing rate relation of vertebrate spinal neurons. *J Comp Physiol A Neuroethol Sens Neural Behav Physiol.* 2007 Feb;193(2):145-58.

Israel JF, Campbell DD, Kahn JH, **Hornby TG**. Metabolic costs and muscle activity patterns during robotic- and therapist-assisted treadmill walking in individuals with incomplete spinal cord injury. *Phys Ther.* 2006, 86:1466-1478.

Lewek MD, Schmit BD, **Hornby TG**, Dhaher YY. Hip joint position modulates volitional knee extensor muscle activity after stroke. *Muscle Nerve*. 2006 Dec;34(6):767-774.

Hornby TG, Kahn JK, Wu M, Schmit BD. Temporal facilitation of spastic stretch reflexes following human spinal cord injury. *J Physiol (Lond)* 2006. J Physiol. 2006 Mar 15;571(Pt 3):593-604.

Wu M, **Hornby TG,** Hilb JA, Schmit BD**.** Flexor reflex responses triggered by imposed knee extension in chronic human spinal cord injury. *Exp Brain Res.* 2006;168:566-576.

Hornby TG, Campbell DD, Zemon DH, Kahn JH. Clinical and quantitative evaluation of robotic-assisted treadmill walking to retrain ambulation following spinal cord injury. *Top SCI Rehabil.* 2005. 11;1-17

Stinear JW, **Hornby TG.** Stimulation-induced changes in lower limb corticomotor excitability during treadmill walking in humans. *J Physiol.* 2005. 567:701-711

Deutsch K, **Hornby TG**, Schmit BD. The intralimb coordination of the flexor reflex response is altered in chronic human spinal cord injury. *Neurosci Lett.* 2005 Jun;380(3):305-10.

Wu M, **Hornby TG,** Hilb JA, Schmit BD**.** Extensor spasms triggered by imposed knee extension in chronic human spinal cord injury. *Exp Brain Res*. 2005; 162:239-249.

Wirz M, Zemon DH, Rupp R, Scheel A, Colombo G, Dietz V, **Hornby TG.** Effectiveness of automated locomotor training in patients with a chronic incomplete spinal cord injury: a multicenter trial. *Arch Phys Med Rehab.* 2005, 86:672-80.

Stauffer EK, Stuart DG, McDonagh JC, **Hornby TG**, Reinking RM. Afterhyperpolarization-firing rate relation of turtle spinal neurons. *J Comp Physiol A Neuroethol Sens Neural Behav Physiol*. 2005 Feb;191(2):135-46

Benz EN, **Hornby TG**, Bode RK, Scheidt RA, Schmit BD. A physiologically based clinical measure for spasticity in spinal cord injury, *Arch Phys Med Rehab* 2005, 86:52-59..

Hornby TG, Zemon DH, Campbell D. Use of a robotic device to assist body-weight supported treadmill training in individuals following spinal cord injury. *Phys Ther*. 2005, 85(1):52-66.

Gorman RB, McDonagh JC, **Hornby TG**, Reinking RM, Stuart DG. Measurement and nature of firing rate adaptation in turtle spinal neurons. *J Comp Physiol A Neuroethol Sens Neural Behav Physiol*. 2005, 191:583-603.

Hornby TG, Tysseling-Mattiace VM, Benz EN, Schmit, B.D. Contribution of muscle afferents to prolonged flexion reflexes following chronic spinal cord injury. *J Neurophysiol* 2004, 92:3375-3384.

Hornby TG, Heckman CJ, Harvey R, Rymer WZ. Changes in voluntary torque and electromyographic activity following oral baclofen. *Muscle Nerve* 2004; 30:784-795.

Schmit BD, **Hornby TG,** Tysseling-Mattiace VM, Benz EN. Absence of local sign withdrawal in chronic human spinal cord injury, *J Neurophysiol*, 2003; 90:3232-3241.

Hornby TG, Rymer WZ, Benz EN, Schmit BD. Wind-up of flexion withdrawal in subjects following chronic spinal cord injury: A marker for neuronal plateau potentials? *J Neurophysiol* 2003, 89:416-426.

Kamper DG, **Hornby TG**, Rymer WZ. Role of the extrinsic flexor muscles in finger joint flexion. *J. Biomech*. 2002; 35:1581-1589.

Hornby TG, McDonagh JC, Reinking RM, and Stuart DG. Effects of excitatory modulation on intrinsic properties of turtle motoneurons. *J Neurophysiol.* 2002, 88:86-97.

Hornby TG, McDonagh JC, Reinking RM, Stuart DG.. Electrophysiological properties of spinal motoneurons in the adult turtle. *J Comp Physiol A Neuroethol Sens Neural Behav Physiol.* 2002, 188:397-408.

Hornby TG, McDonagh JC, Reinking RM, Stuart DG. Motoneurons: a preferred firing range across vertebrate species? *Muscle Nerve*. 2002, 25:632-648.

McDonagh JC, **Hornby TG**, Reinking RM, Stuart DG. Associations between the morphology and physiology of spinal motoneurons and interneurons in the turtle. *J Comp Neurol*. 2002, 454:177-191.

Hornby TG, McDonagh JC, Reinking RM, Stuart DG. Associations between the passive, transitional, and active properties of turtle motoneurons. *Acta Physiol. Pharm. Bulg.* 2001, 26: 15-19.

McDonagh, J.C., Gorman, R.B., Gilliam, E.E., **Hornby, T.G.,** Reinking, R.M. and Stuart, D.G. Electrophysiological and morphological properties on neurons in the ventral horn of the turtle spinal cord. *J. Physiol. (Paris).* 1999, 93: 3-16.

McDonagh, J.C., Gorman, R.B., Gilliam, E.E., **Hornby, T.G**., Reinking, R.M. and Stuart, D.G. Properties of spinal motoneurons and interneurons in the adult turtle: Provisional classification by cluster analysis. *J. Comp. Neurol.* 1998, 400: 544-570.

BOOK CHAPTERS

McDonagh, J.C., Gorman, R.B., Gilliam, E.E., **Hornby, T.G**., Reinking, R.M. and Stuart, D.G. Turtle models for study of segmental motor mechanisms: Advances, issues, and possibilities. In*: Motor Control VIII*, edited by G.N. Gantchev, V.S. Gurfinkel, D.G. Stuart, M. Wiesendanger and S. Mori. Sophia, Academic Publishing House, Bulgarian Academy of Sciences, pp. 25-28. 1996

Hornby, T.G., Stauffer, E.K., and Stuart, D.G. Open Issues on the Functional Role of the Plateau Potential in the Repetitive Discharge of Motoneurons in Experimental Animals and Humans. In: *Sensorimotor Control*, edited by R. Dengler and A. Kossev, Amsterdam, IOS Press

Stuart DG, Stauffer EK, **Hornby TG**, McDonagh JC and Reinking RM. 2002a. Effects of excitatory modulation on the stimulus current-spike frequency relation and afterhyperpolarization of turtle motoneurons. Abstr., International Symposium on Motor Control and Proprioception, Paris, France, July 09-12.

Manuscripts in Preparation

Thajchayapong M, Schmit BD, **Hornby TG**. Adaptations and aftereffects to swing phase assistance during treadmill walking. Submitted to *Med Sci Sports Exerc*

Hornby TG, Kahn JH, Moore JL, Kinnaird C, Echauz A. Combined selective serotonin reuptake inhibitors and locomotor training improves treadmill walking vs locomotor training alone in individuals with motor incomplete spinal cord injury. To be submitted to *JAMA*

INVITED PRESENTATIONS

"Physical and Pharmacological Interventions to Maximize Motor Recovery following Spinal Cord Injury". 4th Annual Rehabilitation Research Day: Advances in Neuro Rehabilitation, The Rehabilitation Institute of St Louis. Oct 20, 2012

"Structuring practice to maximize motor recovery after stroke and spinal cord injury: the importance of amount, intensity and type of practice." Eight hr educational session, Annual Meeting, Illinois Physical Therapy Association, Oct 12, 2012 (in combination with Leddy, A, and Holleran, C).

"The LEAPS Trial Revisited: Research, Current Evidence, and Clinical Practice in Post-stroke Rehabilitation". Two hr education session; Combined Sections Meeting 2012 Chicago, IL Feb 8-11 (In combination with Pamela Duncan, PT, PhD, FAPTA, Andrea L. Behrman, PT, PhD, FAPTA, Bruce Dobkin, MD Scott Janis, PhD, etc).

"Recipe for Future Success: How Do We Identify the Active Ingredients for Effective Locomotor Rehabilitation? Part 1-2". Four hr education session; Combined Sections Meeting 2012 Chicago, IL Feb 8-11 (In combination with Andrea L. Behrman, PT, PhD, FAPTA, Carolyn Patten, PT, PhD, and Daniel Ferris, PhD).

"Structuring practice to maximize motor recovery after stroke and spinal cord injury: the importance of amount, intensity and type of practice." Eight hr educational session, Annual Meeting, New York Physical Therapy Association, Oct 27, 2011 (in combination with Reisman DS).

"From Bench to Bedside: Translation of Basic Scientific Findings of Spinal Cord Physiology to Clinically Relevant Interventions for Individuals with Spinal Cord Injury." Three hr educational sessions. Combined Sections Meeting 2011New Orleans, LA, Feb 9-12, 2011 (in combination with Thompson CK, Hyngstrom AL, Jayaraman A)

"Recipe for Success: Have we identified the active ingredients for effective locomotion rehabilitation?." Three hr educational sessions. Combined Sections Meeting 2011New Orleans, LA, Feb 9-12, 2011. (in combination with Behrman AL and Patten C)

"Structuring practice to maximize motor recovery after stroke and spinal cord injury: the importance of amount, intensity and type of practice." Three hr educational session, Combined Sections Meeting, American Physical Therapy Association, Feb 10, 2011 (in combination with Lang CE, Reisman DS, Moore JL).

"Recovery of Locomotion in SCI: Clinical Experience with Robots and Therapist". Congress on Spinal Cord Medicine and Rehabilitation, Precourse: Neural Plasticity in SCI: The "Black Box" of Neurophysiology in disability and Recovery. Dallas, TX Sept 2009

"Robotic-Assisted Treadmill Walking Following Neurological Injury" 7th International Symposium on Experimental Spinal Cord Repair and Regeneration. Brescia Italy, Feb, 2009

"Efficacy of Locomotor Training Paradigms in Individuals with Neurological Injury"

"Locomotor Training in Persons Post-Stroke: Are We Ready for The Robots?" Crossing the Synapse/Annual Stroke Seminar, Florida Ft Lauderdale Hospital System, Summer 2007.

"Lower Extremity Robotic Devices in Rehabilitation" Respondent to Primary Presenter (S. Harkema), State of the Science, Rehabilitation Engineering Research Center, La Jolla, CA, Winter 2006

"Use of Robotic-Assisted Treadmill Training for Patients with Neurological Injury: Current Issues and Potential Advances", Department of Physical Medicine and Rehabilitation, Northwestern University, Chicago, IL Winter 2006

"Lower Extremity Rehabilitation Devices to Improve Walking Following Neurological Injury", American Congress of Rehabilitation Medicine/America Society of Neurological Rehabilitation, Annual Meeting, Chicago, IL, Fall 2005

"Rehabilitation Robotics to Enhance Recovery Following Neurological Injury", Neural Control of Movement, Key Biscayne, FL, Spring 2005

"Locomotor Control Post-stroke: Beyond Spasticity: Neuropharmacological and Spinal Contributions to Impaired Locomotion", APTA Combined Sections Meeting, New Orleans, LA, Winter 2005

"Rehabilitation Robotics to Enhance Recovery following Neurological Injury"; "Gait Restoration Following Neurological Injury using Robotic-Assisted Treadmill Training", APTA Annual Conference, Chicago IL, Summer 2004

"Clinical Practice of Body Weight Supported Treadmill Training in the Rehabilitation Setting: Guidelines, Evidence and Barriers", given in conjunction with Jeffrey Israel, BPT, UIC Department of Physical Therapy Seminar, Spring 2004

"Mechanisms Underlying Prolonged Flexion Withdrawal Reflexes in Individuals with Spinal Cord Injury" UIC Department of Movement Science Seminar, Spring 2004

"Mechanisms Underlying Prolonged Flexion Withdrawal Reflexes in Individuals with Spinal Cord Injury" UIC Department of Physical Therapy Seminar, Fall 2003

"Current Trends in the Rehabilitation of Locomotion Following Neurological Injury: Bridging Basic Science to Clinical Practice" Grand Rounds, Rehabilitation Institute of Chicago, Chicago, IL Spring, 2002.

"Wind-up of human motor unit behavior in healthy subjects and of flexor withdrawal reflexes in individuals with spinal cord injury: evidence for plateau potential behavior?" Sensory Motor Performance Program, Rehabilitation Institute of Chicago, Chicago, IL Spring 2001

"Neuromodulation of the current-frequency relation of turtle spinal motoneurons." *Plateau Potentials and the Repetitive Discharge of Motor Neurons.* University of Colorado, Summer 2000

"Adventures in spinal neurophysiology: Possible functional roles of the plateau potential", Neuroscience Data Blitz, University of Arizona, Tucson, AZ, Winter 1996.

"Extrinsic modulation of intrinsic motoneuron properties in the adult turtle", Flinn Foundation Symposium, Tucson, AZ, Spring 1997.

"Regulation of motoneuron discharge by plateau potentials: implications for human motor unit behavior" Doings in Motor Control, University of Arizona, Tucson, AZ, Spring 1998.

SCIENTIFIC ABSTRACTS AND POSTER PRESENTATIONS

Hornby, T.G., Kinnaird, CK, Holleran CL, Echauz A, Rodriguez KA. Serotonergic Agents Facilitate Locomotor Recovery in Individuals Post-Stroke Only When Paired With Locomotor Training**.** *Combined Sections Meeting for the American Physical Therapy Association.* 2012. (platform presentation)

Thompson CK, Koutakis P, Kim HE, Leech K, Stergiou N, **Hornby TG**. Non-clinic based objective measures of community mobility in persons with SCI: Preliminary findings of the MAPS Project *Combined Sections Meeting for the American Physical Therapy Association.* 2011.

Thompson CK, Jayaraman A, **Hornby TG**. Modulation of supramaximal volitional torques and spastic reflexes following pharmacological manipulation of serotonin in human incomplete spinal cord injury. *Combined Sections Meeting for the American Physical Therapy Association.* 2010.

Kahn JH, **Hornby TG**. Spring-loaded devices to facilitate locomotor training in people with incomplete SCI. *Combined Sections Meeting for the American Physical Therapy Association.* 2010..

Moore JL, Killian C, **Hornby TG.** Intensive training facilitates locomotor improvements beyond a "plateau" in motor recovery post-stroke. *Combined Sections Meeting for the American Physical Therapy Association*. 2010.

Jayaraman A, Thompson CK, Rymer WZ, **Hornby TG**. High-intensity intermittent vs. conventional resistance training: Impact on strength and function in individuals with incomplete spinal cord injury. *Combined Sections Meeting for the American Physical Therapy Association.* 2010.

Straube D, Leech KL, **Hornby TG**. Psychometric Analysis of the Berg Balance Scale in an Ambulatory Population with Subacute and Chronic Stroke . *Combined Sections Meeting for the American Physical Therapy Association*. 2010.

Thompson CK, Jayaraman A, **Hornby TG**. Serotonergic modulation of peak volitional torques and motoneuron excitability in human incomplete spinal cord injury. *Soc Neurosci Abstr.* 2009. Chicago, IL. 176.1

Jayaraman A, Thompson CK, Rymer WZ, **Hornby TG**. Neural mechanisms underlying augmented volitional torque following noxious stimulus in individuals with incomplete spinal cord injury. *Soc Neurosci Abstr.* 2009. Chicago, IL. 176.2

Hornby TG, Kahn JH, Moore JL, Kinnaird C, Echauz A. Combined selective serotonin reuptake inhibitors and locomotor training improves treadmill walking vs locomotor training alone in individuals with motor incomplete spinal cord injury. *Soc Neurosci Abstr.* 2009. Chicago, IL. 176.3

Wu M, Roth HR, **Hornby TG**, Schmit BD. Improved stepping in human SCI following controlled resistance load training . *Soc Neurosci Abstr.* 2009. Chicago, IL. 176.9

Trumbower RD, Jayaraman A, Schmit BD, **Hornby TG**, Mitchell GS, Rymer WZ. Effects of repetitive acute intermittent hypoxia on lumbosacral motor function in human SCI. *Soc Neurosci Abstr.* 2009. Chicago, IL. 563.1

Thompson CK, Lewek MD, **Hornby TG**. Increased spinal excitability contributes to volitional "warm-up" during repeated maximal volitional efforts in incomplete spinal cord injury. Combined Sections Meeting for the American Physical Therapy Association. 2009.

Jayaraman A, Thompson CK, **Hornby TG**. Intermittent resistance training following incomplete spinal cord injury: central contributions towards improved function. Combined Sections Meeting for the American Physical Therapy Association. 2009.

Saraf P, Rafferty MR, Moore JL, Kahn JH, Leech K, Hendron K, **Hornby TG**. Physical determinants of walking ability in individuals with spinal cord injury. Combined Sections Meeting for the American Physical Therapy Association. 2009.

Kahn JH, **Hornby TG**. Unilateral step training in chronic stroke. Combined Sections Meeting for the American Physical Therapy Association. 2009.

Hornby TG, Schmit BD, Thajchayapong M. Kinematic and electromyographic adaptations to swing-phase assistance during treadmill walking. Combined Sections Meeting for the American Physical Therapy Association. 2009.

Lewek MD, Thompson CK, Heitz RH, **Hornby TG**. Torque output during repeated maximal voluntary isometric contractions in subjects with motor incomplete spinal cord injury. *Soc Neurosci Abstr.* 2007. San Diego, CA. 75.10

Hornby TG, Thompson CK, Lewek MD. Potential neuromuscular mechanisms underlying torque augmentation during "fatiguing" contractions in human incomplete spinal cord injury. *Soc Neurosci Abstr.* 2007. San Diego, CA. 75.11

Thajchayapong M, Schmit BD, **Hornby TG**. 2007. Adaptations and aftereffects of muscle activation patterns and foot kinematics following passive swing phase assistance. *Soc Neurosci Abstr.* 2007. San Diego, CA. 410.18

Rymer WZ., **Hornby TG**, Mitchell GS, Schmit BD Trumbower R, Effects of intermittent hypoxia on motor function in persons with incomplete SCI. *Soc Neurosci. Abstr*. 2007. San Diego, CA. 82.18

Kahn JH, Campbell DD, Demott T, Moore JL, Roth HR, **Hornby TG**. Therapist- vs. robotic-assisted treadmill training in individuals with chronic hemiparesis post-stroke. *APTA Combined Sections Meeting*, 2007. Boston, MA

Stauffer EK, McDonagh JC, **Hornby TG**, Reinking RM, Stuart DG. Power relation between firing rate and afterhyperpolarization (AHP) in turtle motoneurons. *Soc. Neurosci Abstr*. 2006. Atlanta, GA. 55.13

Lewek MD, Schmit BD, **Hornby TG**, Dhaher YY.. The role of hip movement on quadriceps activity and its influence on stiff-legged gait post-stroke. *Soc Neurosci. Abstr*. 2006Atlanta, GA 656.13

Hornby TG, Schmit BD, Theiss RD. Serotonergic modulation of motor function in human spinal cord injury. *Soc. Neurosci Abstr.* 2006.. Atlanta, GA 146.20

Wu M, Kahn JH, **Hornby TG**, Schmit BD. Spastic reflexes following prolonged electrical stimulation of the thigh in human spinal cord injury *Soc Neurosci Abstr*. 2006. Atlanta, GA 146.19

Moore JL, Roth HR, Lewek M, **Hornby TG**, Dhaher YY Development and Validation of Circumduction Assessment Scale for Individuals With Hemiplegia. *APTA Combined Section Meeting* 2006. San Diego, CA.

Lewek M, Schmit B, **Hornby TG**, Dhaher Y Hip Joint Position Affects Volitional Knee Extensor Activity Post-stroke *APTA Combined Section Meeting.* 2006. San Diego, CA

Kahn JH, **Hornby TG** Single Limb Body Weight-Supported Treadmill Training. *APTA Combined Section Meeting.* 2006. San Diego, CA.

Israel JF, **Hornby TG**. Physiological Responses of Individuals With Spinal Cord Injury during Robotic-Assisted Treadmill Walking. *APTA Combined Section Meeting.* . 2006 San Diego, CA.

Prior MM, **Hornby TG**, Stinear JW. Paired associative stimulation increases corticomotor excitability when applied to tibialis anterior motor pathways. *Soc. Neurosci. Abstr.* 2005. 31:864.5.

Stauffer EK, McDonagh JC, **Hornby TG**, Reinking RM and Stuart, Reflections on the afterhyperpolarization (AHP) firing rate relation of spinal motoneurons and interneurons in vertebrates**.** *Soc. Neurosci. Abstr.* 2005. 31**:** 750.7

Wu M, **Hornby TG**, Hilb JA, Schmit BD. 2005. Extensor spasms in human spinal cord injury triggered by imposed knee extension. *Soc. Neurosci Abstr.* 30: 311.2

Dhaher YY. Hayes TE, Rymer WZ, **Hornby TG**. Swing-phase frontal plane kinetics in normal and stroke populations. *Soc. Neurosci Abstr.* 2004. 30: 180.3.

Zemon DH, Campbell DD, Hilb JA, **Hornby TG**. Therapist-assisted BWSTT-induced short and long term over ground gait speed adaptation in SCI. *APTA Combined Section Meeting* 2004. New Orleans, LA

Deutsch KM, **Hornby TG**, Schmit BD. Plastic changes in the flexor reflex in individuals with chronic spinal cord injury. *Soc. Neurosci Abstr.* 2004. 30: 69.2.

Hornby TG, Tysseling-Mattiace VM, Benz EN, Schmit BD. Contribution of muscle afferents to exaggerated flexion withdrawal reflexes in human spinal cord injury. *Soc. Neurosci Abstr*. 2003: 275.10.

Hornby TG, Zemon DH, Acosta S, Stine R, and Rymer WZ. Changes in locomotor performance in spinal cord injured subjects following body-weight supported, robotic-assisted treadmill training. *Soc Neurosci Abstr*. 2002. Orlando, FL

Schmit BD, **Hornby TG**, Benz EN, Tysseling-Mattiace VM.. The absence of local sign flexion withdrawal in human spinal cord injury. *Soc Neurosci Abstr.* 2002. 853.10.

Stuart DG, Stauffer EK, **Hornby TG,** McDonagh JC and Reinking RM. 2002a. Effects of excitatory modulation on the stimulus current-spike frequency relation and afterhyperpolarization of turtle motoneurons. Abstr., International Symposium on Motor Control and Proprioception, Paris, France, July 09-12.

Stuart DG, **Hornby TG**, Stauffer EK, McDonagh JC and Reinking RM. A Kernell-type analysis of spinal interneurons and motoneurons in the turtle. Abstr., International Symposium on Motoneurones And Muscles-The Output Machinery, 2002, University of Groningen, The Netherlands, June 27-29.

Hornby TG, Benz EN, Stuart DG, and Schmit BD. Wind-up of flexor reflexes in human spinal cord injury. *Soc Neurosci Abstr*. 2001. San Diego, CA

Hornby, TG, McDonagh JC, Reinking RM, and Stuart DG. Preferred firing range of motoneurons: human vs. cat vs. turtle. *Soc Neurosci Abstr*. 2000.26:460.

Stuart DG, McDonagh JC, **Hornby, TG**, Reinking RM. Quantitative morphology of vertebrate ventral-horn motoneurons vs. interneurons. *Soc Neurosci Abstr*. 2000.26: 460.

Hornby TG, McDonagh JC, Reinking RM, Stuart DG. Plateau potential contribution to the stimulus current-spike frequency relation of turtle motoneurons. 1998.*Soc Neurosci Abstr*. 24: 914.

McDonagh JC, **Hornby TG**, Reinking RM, Stuart DG. Morphological and physiological properties of turtle spinal motoneurons and interneurons. *Soc Neurosci Abstr*. 1998 .24: 914.

Hornby TG, McDonagh JC, Reinking RM, Stuart DG. Extrinsic modulation of the stimulus current-spike frequency relation of motoneurons in the adult turtle. *Soc. Neurosci. Abstr*. 1997. 23: 1301.

McDonagh JC, Gorman RB, Gilliam EE, **Hornby TG**., Reinking, R.M. and Stuart, D.G. Firing-rate properties of ventral-horn neurons in the turtle and their relevance to mammalian motoneurons and interneurons. Proceedings of the *37th ICB Seminar/Workshop* (Warsaw, Poland, April 7-10). 1997.

Stuart DG, McDonagh JC, Gorman RB, Gilliam EE, **Hornby TG**, Reinking RM. Firing-rate properties of spinal motoneurons vs. ventral-horn interneurons and their significance for spinal pattern generators. Proceedings *Brain and Movement Symposium* (St. Petersburg/Moscow, July 6-10), p. 187. 1997.

Gilliam EE, McDonagh JC, **Hornby TG**, Reinking RM Stuart DG. Morphological verification of a provisional electrophysiological classification of motoneurons vs. interneurons in the turtle spinal cord. Abstracts, *International Symposium on Sensorimotor Coordination: Amphibians, Models and Comparative Studies* (Sedona, AZ, Nov. 22-24) p. 64. 1996.

McDonagh JC, Gorman RB, Gilliam EE, **Hornby TG**, Reinking RM, Stuart DG. The stimulus current-firing frequency (I/f) relationship: motoneurons vs. interneurons. Abstracts, *VIII Int. Symp. Motor Control* (Borovets, Bulgaria, June 23-27), pp. 67-68. 1996.

Gilliam EE, Gorman RB, McDonagh JC, **Hornby TG,** Reinking RM, Stuart DG. Hysteresis in stimulus current-firing frequency relation of spinal motoneurons and interneurons. *Soc. Neurosci. Abstr*1995.. 21: 145.

Gorman RB, McDonagh JC, Gilliam EE, **Hornby TG**, Reinking RM, Stuart DG. Afterhyperpolarization of spinal motoneurons and interneurons in the adult turtle. *Soc. Neurosci. Abstr*. 1995. 21:145..

McDonagh JC, Gorman RB, Gilliam EE, **Hornby TG**., Reinking, R.M. and Stuart, D.G. Cluster analysis of spinal neurons in adult turtle. *Soc. Neurosci. Abstr*. 1995. 21: 144..

Stuart DG, McDonagh JC, Gilliam EE, **Hornby TG**, Gorman RB. Neural mechanisms for the graded development of muscle force. Proceedings, *Sixth Annual Spring Brain Conference* (Sedona, AZ) pp. 20. 1994.

RESEARCH SUPPORT

***Ongoing support*:**

Department of Defense Spinal Cord Injury Clinical Trials Award
Date of Project Period: 09/01/11 – 08/31/15 Direct Costs: $200,000/yr
Monoaminergic Modulation of Motor Function in Incomplete SCI (PI: Hornby)
Proposal to quantify effects of single dose monoaminergic agents (SSRIs, tizanidine) and combined agents with locomotor training in subacute incomplete spinal cord injury.
Role: PI (20% effort)

NIDRR - H133D344232

Date of Project Period: 11/1/11– 10/30/16 Direct Costs: $150,000/yr
Midwest Regional Model Systems Center for Spinal Cord Injury (PI: D. Chen; Rehabilitation Institute of Chicago)

Sub-project: *Low Cost Devices to Facilitate Locomotor Training in SCI.* A total of approximately 90 subjects will be recruited to participate in the short- and long-term adaptations and aftereffects which occur following passive (elastic) assistance provided at the legs and trunk during treadmill walking. The use of simple, low-cost devices which can augment treadmill walking may improve the delivery of intensive walking interventions in outpatient physical therapy facilities

Role: PI on Research Project (10% effort)

NIH/NICHD – R01-NS062982,
Date of Project Period: 09/20/09 – 08/31/12 no cost extension Direct Costs: $250,000/yr
Reflex Contributions to Enhanced Walking Function in SCI

Proposal to quantify reflex contributions to locomotor ability in patients with motor incomplete SCI during simulated or actual walking, with an emphasis on the effects of pharmacological interventions.

Role: Multiple PI (15% effort)

NIDRR/RRTC - H133B031127
Date of Project Period: 10/1/08 – 09/30/13 Direct Costs: $1, 001,453 total
Technology Promoting Integration for Stroke Survivors (PI: E. Roth; Rehabilitation Institute of Chicago)

Sub-project: *Short and Long Term Adaptations of Overground Ambulation in Subjects with Chronic Stroke.* A total of approximately 150 subjects will participate in four different projects.

Role: PI on Sub-Project (15% effort)

NIDRR - H133D344232
Date of Project Period: 10/1/06 – 09/30/11 no cost extension Direct Costs: $120,000/yr
Midwest Regional Model Systems Center for Spinal Cord Injury (PI: D. Chen; Rehabilitation Institute of Chicago)

Sub-project: *Low Cost Devices to Facilitate Locomotor Training in SCI.* A total of approximately 90 subjects will be recruited to participate in the short- and long-term adaptations and aftereffects which occur following passive (elastic) assistance provided at the legs and trunk during treadmill walking. The use of simple, low-cost devices which can augment treadmill walking may improve the delivery of intensive walking interventions in outpatient physical therapy facilities

Role: PI on Sub-Project (10% effort)

Completed support:
Craig H. Neilsen Foundation - 36830
Date of Project Period: 1/1/08 – 12/31/10 Direct Costs: $220,000 total
Serotonergic Mechanisms Underlying Motor Behaviors in Human Spinal Cord Injury (Rehabilitation Institute of Chicago)

Proposal to assess cortical and spinal mechanisms underlying altered volitional force and reflex function in human incomplete spinal cord injury, using agents to augment or depress endogenous serotonin activity.

Role: PI (10% effort)

NIDRR/FIP - H133G060124
Date of Project Period: 11/1/06 – 10/31/10 Direct Costs: $434,000 total
Enhanced Motor Recovery Using Serotonergic Agents (Rehabilitation Institute of Chicago)

Proposal to test the efficacy of selective serotonin reuptake inhibitors (i.e., SSRIs) to increase volitional forces and spastic motor activity alone or in combination with locomotor training. Ninety subjects with chronic hemiparesis post-stroke will participate in studies to investigate short and long-term changes in motor behaviors with pharmacological or combined physical interventions.
Role: PI (20% effort)

NIH/R21-HD046876-01A1
Date of Project Period 4/1/05 – 3/31/07 (extension through 3/31/2009) Direct Costs: $275,000
Physical and Pharmacological Effects on Movement in SCI (Rehabilitation Institute of Chicago)
Proposal to determine the efficacy of body-weight supported treadmill training and serotonergic agents in the improvement of strength, spasticity and locomotor ability following chronic (> 1yr) motor incomplete spinal cord injury. Variables of strength, spasticity, postural control and overground ambulation will be assessed and compared post walking training in groups with or without selective serotonin reuptake inhibitors.
Role: PI (25% effort)

NIDRR/RRTC - H133B031127
Date of Project Period: 10/1/03 – 9/30/08 Direct Costs: $1, 001,453
Technology Promoting Integration for Stroke Survivors (PI: E. Roth; Rehabilitation Institute of Chicago)
Sub-project: *Short and Long Term Adaptations of Overground Ambulation in Subjects with Chronic Stroke.* A total of approximately 150 subjects will participate in four different projects.
Role: PI on Sub-Project (25% effort)

Paralyzed Veterans of America/Spinal Cord Research Program - 2561
Date of Project Period: 1/1/08 – 12/31/09 Direct Costs: $145,000
Improved locomotion in SCI through locomotor adaptations (PI: M Wu; Rehabilitation Institute of Chicago)
The overall objective of this proposed study is to enhance walking function in people with incomplete SCI by minimizing the amount of assistance or by adding adaptive resistance to BWSTT. A specialized cable robot has been develop to more precisely apply limb loads during treadmill walking, similar to previously developed passive (elastic) devices.
Role: Co-I (5% NC effort)

NIH/1F32NS042516-01
Date of Project Period 12/1/01-11/30/03 Direct Costs: $ 74,400
Mechanisms of Weakness following Incomplete SCI (mentor: WZ Rymer)
The primary goals of this proposal were to characterize recruitment and rate coding patterns of human motor units in patients with spinal cord injuries during steady-state contractions and to quantify the time-varying rate modulation patterns during linearly-varying isometric contractions.

Paralyzed Veterans of America/Spinal Cord Research Program - 2261-01
Date of Project Period: 1/1/03 – 12/31/04 Direct Costs: $147,262
Effects of robotic-assisted treadmill training on the recovery of ambulation following acute, motor incomplete spinal cord injury (Rehabilitation Institute of Chicago)
Proposal to determine the effectiveness of a robotic assistive device, the Lokomat, in assisting the recovery of spinal cord injured patients. The Lokomat is a motorized orthosis in which a patient is strapped, with his or her weight supported, while suspended over a treadmill while the device assists the individual in walking in a normal pattern.
Role: PI (25% effort)

Christopher Reeve Paralysis Foundation - RA2-0203-2B

Date of Project Period 1/15/03 – 1/14/05 Direct Costs: $143,660
Effects of robotic vs. manual assistance on locomotor recovery in humans following motor incomplete spinal cord injury (Rehabilitation Institute of Chicago)

Proposal to determine the efficacy of robotic-vs manual-assisted body-weight supported treadmill training in the recovery of overground locomotion following acute (< 6 mo.), motor incomplete spinal cord injury. Variables of strength, spasticity, postural control and overground ambulation will be assessed and compared to measures obtained in individuals without treadmill training.

Role: PI (25% effort; initial PI: W.Z. Rymer, transferred status in 2nd year of grant)

NIDRR/RERC - H133E020724
Date of Project Period: 10/01/02 – 09/30/07 Direct Costs: $805,453
Machines Assisting Recovery From Stroke (PI: W.Z. Rymer; Rehabilitation Institute of Chicago)

Proposal to develop and test the efficacy of devices to facilitate rehabilitation in individuals with hemiplegia subsequent to stroke. Sub-project: *Gait Restoration in Hemiparetic Stroke Patients using Goal-Directed, Robotic-Assisted Treadmill Training* A total of approximately 300 subjects with stroke will participate in five different projects, each examining the effects of using machines in rehabilitative training.

Role: Co-PI on Research Sub-Project (10% effort)

NIDRR/FIP - H133G040065
Date of Project Period: 10/01/04 – 9/30/07 Direct Costs: $375,000
Gait abnormalities in individuals with stroke: Implications to rehabilitation (PI: Y.Y. Dhaher; Rehabilitation Institute of Chicago)

Proposal to quantify the mechanisms underlying hip circumduction during walking in patients post-stroke. Patients were followed for up to 1 yr post-stroke, with serial measures of weakness, spasticity and goal-directed lower limb movements during recovery of walking.

Role: Co-PI (5% NC effort)

CONTINUING EDUCATION WORKSHOPS CONDUCTED

"Neurologic Practice Essentials: Exploring Neuroplasticity and Its Rehabilitation Implications, Part 1"; Combined Sections Meeting APTA, Chicago, IL Winter 2012 (In combination with James V. Lynskey, PT, PhD, Deborah Backus, PT, PhD, Andrea L. Behrman, PT, PhD, FAPTA, etc)

"Locomotor Training in Individuals Post-stroke and Spinal Cord Injury: Lecture and Laboratory " Annual Spinal Cord Injury Course, Rehabilitation Institute of Chicago, Chicago, IL, Summer 2011

"Locomotor Training in Individuals Post-stroke and Spinal Cord Injury: Lecture and Laboratory" Annual Spinal Cord Injury Course, Rehabilitation Institute of Chicago, Chicago, IL, Summer 2010

"Introduction to Locomotor Control in Humans"; Walk the Walk: Strategies for treatment of locomotor dysfunction in individuals with neurological injury, Rehabilitation Institute of Chicago, Chicago, IL, March 2010

"Use of Robotic-Assisted Treadmill Training for Patients with Neurological Injury: Current Issues and Potential Advances" Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Summer 2009

"Use of Robotic-Assisted Treadmill Training for Patients with Neurological Injury: Current Issues and Potential Advances" Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Summer 2008

"Locomotor Training in Individuals Post-stroke" Annual Stroke Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2008

"Use of Robotic-Assisted Treadmill Training for Patients with Neurological Injury: Current Issues and Potential Advances" Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Summer 2007

"Locomotor Training in Individuals Post-stroke" Annual Stroke Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2007

"Use of Robotic-Assisted Treadmill Training for Patients with Neurological Injury: Current Issues and Potential Advances" Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2006

"Current Research in Locomotor Training and Recovery: Bridging Basic Science to Clinical Practice", (4 hrs lecture/laboratory) Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2006

"Current Research in Locomotor Training and Recovery: Bridging Basic Science to Clinical Practice", Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2005

"Clinical Trials to Enhance Recovery of Locomotion Following Spinal Cord Injury", Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2004

"Clinical Trials to Enhance Recovery of Locomotion Following Spinal Cord Injury", Advanced SCI Course, Rehabilitation Institute of Chicago, Chicago, IL, Spring 2003

MEMBERSHIP IN SCIENTIFIC ORGANIZATIONS

American Physical Therapy Association – Section on Neurology, Research

Society for Neuroscience

SERVICE

Departmental

Curriculum Committee, Department of Physical Therapy, UIC (2010-present)

Faculty Search Committee, Department of Physical Therapy, UIC (2007-present)

Admissions Committee, Department of Physical Therapy, UIC (2012)

Departmental Teaching Award Task Force, UIC (2005-present)

Departmental Graduate Assistantship Task Force (2005-present)

Organization and initiation of the DPT/PhD program - designed for entry level clinicians following graduation of the DPT for smooth transition to the PhD degree in related disciplines.

Professional

Biomedical journals

Editorial Board, Journal of Neurologic Physical Therapy 2010 -present

Ad hoc Reviewer for J Neurophysiol., J Physiol., J Neurosci., Exp Brain Res., Brain Res., Muscle Nerve, Can J Appl Physiol, Euro J Neurosci, Phys Ther, Arch Phys Med Rehabil, J Neurotrauma, J Neurol Phys Ther, Neurorehabil Neural Repair, J Appl Physiol

Granting agencies

Ad hoc Grant Reviewer: NIH/NICHD/NCMRR	2006, 2007, 2010-2012
Ad hoc Grant Reviewer: Shriners Children Hospital-Neuroscience	2011-2012
Ad hoc Grant Reviewer: VA Merit Review Program; Spinal Cord Injury, Stroke	2005-2010
Ad Hoc Grant Reviewer: Paralyzed Veterans of America	2007
Ad Hoc Grant Reviewer: Craig H. Neilsen Foundation	2007-2009

HONORS AND AWARDS

Excellence in Research in Neurological Physical Therapy, Neurology Section, APTA	2012
Advance for Physical Therapy and Rehabilitation: Innovation in Rehabilitation Award	2010
Suzann K Campbell Teaching Award, Dept of Physical Therapy, UIC	2009

Excalibur Award for Teaching Excellence, College of Applied Health Sciences, UIC 2009
Sarah Baskin Award for Excellence in Research, Rehabilitation Institute of Chicago 2002
Magnuson Service Award, Rehabilitation Institute of Chicago 2002
Alice Oulette Physical Therapy Scholarship 1998
Meritorious Performance in Teaching, University of Arizona Foundation 1996
Robert S. Flinn Foundation Fellowship 1995
American Psychological Association, Fellowship in Neuroscience 1995-1998

TEACHING

Current Teaching Responsibilities

University of Illinois, Chicago, IL

PT 605: Systems Physiology and Plasticity (4 units) 30-55 PT students 2001-present
Course coordinator/primary instructor
Previously: *Functional Histology*
Topics included: adaptive physiology/pathophysiology of multiple organ systems
Teaching evaluations rating (last 5 years): range 4.32-4.77 (out of 5)

PT 562: Neural Plasticity and Pathophysiology (3 units) 15-25 grad/CE students 2005-present
Course coordinator/primary instructor
Topics included: mechanisms of neural plasticity in reduced models and in humans with and without neurological injury
Teaching evaluations rating (last 5 years): range 4.45-4.86 (out of 5)

University of Illinois, Chicago, IL

PT 629: Science in Practice (3 units) 30-40 PT students 2005-2008, 2012
Course coordinator/primary instructor
Topics included: statistical and research methods in rehabilitation and neuroscience

PHYB 552: *Human Physiology II* 10-15 grad students 2006-present
Invited lecturer (1 2-hr lecture/discussion)
Topics included: Locomotor function and mechanisms of recovery following spinal cord injury

NEUR 502 – Systems Neurophysiology 5 grad students 2012
Invited lecturer (3 2-hr lectures/discussion)
Topics included: muscle/motor unit physiology, reflex and spinal cord function, cortical and cerebellar control of movement

Northwestern University

HMP: NUIN_442-0: Topics in Rehabilitation Research 5-10 grad students 2010--2012
Guest lecturer (2 2-hr lectures)
Topics: General information/recent research in spinal cord injury

Previous Teaching Responsibilities

PT 620: *Clinical Applications (2 units)* 30-40 PT students 2008-2009

Course co-coordinator: journal discussions

University of Arizona, Tucson, AZ

Exercise & Sport Sciences 421- Laboratory Lecturer Topics included: cardiovascular, respiratory, muscle function	13-26 undergraduate students	1994-1997
Physiology 601/801 - Systems Physiology Teaching assistant/discussion leader Topics included: ECG, mechanical heart model	120 medical and graduate students	1995-1996
Physiology 480/580 - Human Physiology Lecturer/teaching assistant Topics included: exercise physiology, neurobiology	160 undergraduate and graduate students	1995-1997
Physiology 695a - Motor Control Colloquium Co-coordinator Topics included: neurobiology of locomotor behaviors	8 graduate students	1996
Exercise & Sport Sciences 462- Neuromechanical Kinesiology Teaching assistant/lecturer Topics included: neuromuscular/biomechanical bases of movement	80 undergraduate and graduate students	1996
Neuroscience 805 - Human Neuroscience Teaching assistant Topics included: neuroanatomy and motor control pathophysiology	30 medical students	1996-1997
Physiology 418 - Physiology for Engineers Lecturer (7 lectures) Topics included: cellular neurophysiology; motor control pathophysiology	10 undergraduates	1996
Physiology 202 - Anatomy and Physiology Lecturer (12 lectures) Topics included: Cardiovascular/respiratory anatomy and physiology	100 undergraduates	1997

Theses/Dissertation Service

Primary Research Advisor:

Completed Students

Poonam Saraf, BS, - Masters of Science, Department of Physical Therapy, University of Illinois at Chicago, Aug 2008;Thesis title: Physical determinants of laboratory- and community-based measures of walking function in human spinal cord injury.

Jeffrey F. Israel, BPT – Masters of Science, Department of Physical Therapy, University of Illinois at Chicago, Dec. 2005; Thesis title: Cardiopulmonary and Electromyographic Responses to Robotic- vs. Therapist-Assisted Treadmill Walking in Patients with Incomplete Spinal Cord Injury

Michelle M. Prior, BS – Masters of Science, Department of Movement Science, University of Illinois at Chicago, Dec 2005; Thesis title: Spike-timing dependent plasticity of human motor cortex during walking

Ploy Thajchayapong, PhD , Department of Mechanical Engineering, Northwestern University, Dec 2011; Thesis title: Locomotor adjustments to swing phase assistance and resistance in intact and neurologically impaired subjects

Christopher K. Thompson, BS, (PhD July 2012), Department of Kinesiology and Nutrition, University of Illinois at Chicago; Tentative thesis tile: Mechanisms of augmented force production with repeated maximal effort contractions in human spinal cord injury

Current Students:

Kristan Leech, PT (PhD expected 2015), Northwestern University Institute of Neuroscience, Northwestern University, Tentative thesis title: Modulatory and growth factors contributions to exercise-related locomotor alterations in human incomplete spinal cord injury

Hyosub Kim, SPT (PhD expected 2015), Graduate Program in Kinesiology, Nutrition and Rehabilitation Sciences, University of Illinois at Chicago; Tentative thesis title: Alterations in motor unit discharge properties during physical and pharmacological interventions in human incomplete spinal cord injury.

Dissertation and Thesis Committees:

Completed Students

James Sulzer, PhD, Department of Mechanical Engineering, Northwestern University, 2009
Vijayasarat Govindarajan, MS, Department of Biomedical Engineering, Marquette University, 2008
Mary Ellen Stoykov, PhD, Department of Kinesiology, University of Illinois at Chicago, 2008
Alison Hyngstrom, PhD, Northwestern University Institute of Neuroscience, 2007
James Cotey, MS, Department of Biomedical Engineering, Marquette University, 2006
M. Kevin Garrison, PhD, Department of Biomedical Engineering, Marquette University, 2004
Tanvi Bhatt, PhD, Department of Movement Science, University of Illinois at Chicago, 2004

Mentoring

Undergraduate Students:

Michelle Fern, Department of Biomedical Engineering, Washington University	2012
Patrick (PJ) Harrison, Department of Biology, Simpson College, Iowa	2010
Meredith Mallory, BS, Department of Biology, Virginia Tech	2009
Jacob Segil, BS, Department of Mechanical Engineering, UIUC	2008
Robert Heitz, BS, Department of Biomedical Engineering, UIC	2006-2007

Physical Therapy Students/Research Assistants:

Julie Cain-Hamby, Department of Physical Therapy, UIC	
Kaitlyn Pasquilini, Department of Physical Therapy, UIC	2011-present
David Selak, Department of Physical Therapy, UIC	2011-present
Hyosub Kim, Department of Physical Therapy, UIC	2010-present
Leslie O'Donnell, Department of Physical Therapy, UIC	2010-present
Nathan Whitney, Department of Physical Therapy, UIC	2008-2010
Christopher K. Thompson, Department of Physical Therapy, UIC	2007-2009
Adam Janowski, Department of Physical Therapy, UIC	2007-2009
Kristan Leech, Department of Physical Therapy, UIC	2007-2010
Anthony J. Echauz, Department of Physical Therapy, UIC	2006-2010

Kathryn Hendron, Department of Physical Therapy, UIC 2006-2009
Marie Zolkiewski, Department of Physical Therapy, UIC 2003-2005
Kristine Henderson, Department of Physical Therapy, UIC 2003-2005

Medical Students:
Stephanie Hendricks, BS, Michigan State University (2nd year medical student) 2012
Blake Kandah, BS, George Washington University (2nd year medical student) 2012
Allison Ramsey, BS, Northwestern University (2nd year medical student) 2009
Matt Paluck, BS, Arizona Health Sciences University (2nd year medical student) 2007
Julia Coccia, BA, Northwestern University (2nd year medical student) 2004
Jon Myers, BS, University of Iowa (2nd year medical student) 2002

Research Physical Therapists/Assistants:
Patrick Hennessey, MPT, NCS, Research Physical Therapist, RIC 2012-present
Carey L. Holleran, MPT, NCS, Research Physical Therapist, RIC 2009-present
Abigail Leddy, DPT, MSCI, Research Physical Therapist, RIC 2011-present
Tony J. Echauz, DPT, Research Physical Therapist, RIC 2010-2012
Kelly S. Rodriguez MPT, NCS, Research Physical Therapist, RIC 2009-2011
Miriam R. Rafferty, MSPT, NCS, Research Physical Therapist, RIC 2008-2010
Jennifer L. Moore, MPT, NCS, DHS, Research Physical Therapist MPT, RIC 2004-2009
Heidi R. Roth, MSPT, NCS, Research Physical Therapist, RIC 2004-2008
Tobey Demott, MSPT, Research Physical Therapist, RIC 2004-2005
Jennifer H. Kahn, DPT, NCS, Research Physical Therapist, RIC 2003-2009
Donielle D. Campbell, PTA, Research Physical Therapist Assistant, RIC 2003-2008
David H. Zemon, MSPT, Research Physical Therapist, Rehabilitation Institute Chicago (RIC) 2002-2004

Post-doctoral Fellows
Virginia Chu, PhD (Rehabilitation Institute Chicago) 2009-current
Research focus: Pharmacological effects of volitional motor function in SCI

Arun Jayaraman, PhD, PT (Rehabilitation Institute Chicago) 2008-2011
Research focus: Harnessing alterations in spinal excitability to augment volitional strength
Current position: Director, Laboratory, Rehabilitation Institute of Chicago

Krishnaj Gourab, MD (Marquette University; co-advisor: B. Schmit) 2006-2008
Research focus: Enhanced motor recovery using serotonergic agents
Current position: Resident – PM&R, University of Michigan

Renee D. Theiss, PhD ((Rehabilitation Institute Chicago; co-advisor: W. Rymer) 2006-2008
Research focus: Pharmacological basis for motor function in human SCI
Current position: Assistant Professor, Governor's State University, Chicago, IL

James W. Stinear, PhD, DC (Rehabilitation Institute Chicago) 2003-2004
Research focus: TMS protocols to augment corticomotor excitability
Current position: Research Scientist, Rehabilitation Institute Chicago

Michael D. Lewek PhD, PT (Rehabilitation Institute Chicago; co-advisor: B. Schmit) 2003-2006
Research focus: Abnormal muscle activation patterns in subjects post-stroke
Current position: Assistant Professor, University of North Carolina

Medical Residents

Hector Lopez, MD (Rehabilitation Institute Chicago) 2006-2007
Research focus: Creatine supplementation and locomotor training post-stroke

Research Assistants:

Jaclyn Camardo, BS, Research Assistant, RIC 2012-present
Emily Kirk, BA, Research Assistant, RIC 2011-present
Taryn Lochhead, BS, Research Assistant, RIC 2010-2012
Eric Wagner, BS, Research Assistant, RIC 2009-2011, 2012-present