

Chet T. Moritz, PhD

Curriculum Vitae

Education

Undergraduate

1995-1998 Bachelor of Science, Zoology, University of Washington, Seattle, WA

Graduate

1999-2003 Doctor of Philosophy, Integrative Biology, University of California, Berkeley, CA

Postgraduate Training

2003-2004 Postdoctoral Fellow, University of Colorado, Boulder, CO

2004-2008 Senior Fellow, University of Washington, Seattle, WA

Faculty Positions Held

2009-2010 Research Assistant Professor, Department of Physiology & Biophysics, University of Washington, Seattle, WA

2010- Assistant Professor, Rehabilitation Medicine, University of Washington, Seattle, WA

2010- Assistant Professor (joint), Department of Physiology & Biophysics, University of Washington, Seattle, WA

2010- Graduate Faculty, Neurobiology and Behavior Graduate Program, University of Washington, Seattle, WA

Honors

1995-1998 Washington Scholar: four-year undergraduate tuition waiver

1998 Graduated *Cum Laude* from University of Washington Honors Program

2001 Outstanding Graduate Student Instructor, University of California, Berkeley

2003 American Society of Biomechanics President's Award

2008 Manuscript selected as one of top scientific advances by editors of *Nature*

2009 Invited keynote speaker, University of Calgary Medical Science symposium

2009 American Heart & Stroke Association Scientist Development Grant recipient

2009 National Institutes of Health EUREKA Award recipient

2010 Recognized at UW School of Medicine Distinguished Faculty Celebration

2012 DARPA Young Faculty Award

Professional Organizations

2002- American Society of Biomechanics

2003- Society for Neuroscience

2005- American Physiological Society

Teaching Responsibilities

2006 P BIO 520A, Introduction to Matlab for Scientists, 1 credit (Autumn)
Responsible for course design, all lectures & grading

2009 BIOL 497B, Muscle Physiology and Movement, 3 credits (Winter)
Responsible for course design, coordination, and all lectures and exams

2010 BIOL 464, Muscle Physiology and Movement, 3 credits (Summer & Autumn)
Responsible for course design, coordination, and all lectures and exams

- 2010 REHAB 562: Graduate Seminar (Spring)
Present 1 guest lecture on Future Treatments for paralysis
- 2010- NBIO 402, Disorders of the Nervous System, 3 credits (Annually in Winter)
Present 3 guest lectures annually (~10% of lectures)
- 2011 REHAB 521, Pathophysiology for Rehabilitation, 3 credits (Spring)
Present 4 lectures (all in-person lectures in this primarily online course)
- 2011- 2012 REHAB 503, Geriatrics, 3 credits (Spring)
Present 1 Guest lecture on exercise physiology and aging
- 2012- REHAB 525, Exercise Physiology for Rehabilitation (Annually in Spring)
Responsible for course design, all lectures and assessments
- 2012- REHAB 562: Graduate Seminar in Neuroscience (Bi-annually in Spring)
Present 3 guest lectures on motor control, neuroplasticity, and neurotechnology
- 2012 EE599: Graduate Seminar in Brain-computer interface (BCI) (Spring)
Present 1 guest lecture on BCIs to restore and regenerate motor function

Editorial Responsibilities

- 2009 - Review Editor; Frontiers in Neuroprosthetics journal
2013 - Editorial Board Member, Brain-Computer Interfaces Journal

Special National Responsibilities

Grant reviewer

- 2009-2010 NIH study section ad-hoc member: ZRG1-F02B Sensory, Motor & Cognitive Neuroscience Fellowship Section
- 2011 NIH Study Section: ZHD1 DSR-K 52, Controller Development for Upper Limb Movement
- 2010- Wings for Life – Spinal Cord Research Foundation
- 2010 US-Israel Bi-national Science Foundation
- 2012 NSF Division of Information and Intelligent Systems, Ad hoc reviewer
- 2013 NIH study section ad-hoc member: NIBIB K-Award review panel

Referee (27 journals)

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| Nature | Neuroscience Letters |
| Journal of Neuroscience | Neural Networks |
| Journal of Neurophysiology | Symmetry |
| Journal of Applied Physiology | PLoS Biology |
| Journal of Neural Engineering | Gait and Posture |
| Journal of Sports Sciences | Experimental Neurology |
| Journal of Experimental Biology | Human Movement Science |
| Journal of Applied Biomechanics | Frontiers in Neuroprosthetics |
| Journal of Neuroscience Methods | Bioinspiration & Biomimetics |
| Journal of Computational Neuroscience | Somatosensory and Motor Research |
| Journal of Neural Engineering and Rehabilitation | Exercise and Sports Science Reviews |
| Annals of Biomedical Engineering | European Journal of Applied Physiology |
| Sensors | IEEE Transactions on Biomedical Engineering |
| | IEEE Transactions on Neural Systems & Rehabilitation Engineering |

Special Local Responsibilities

- 2005-2008 Post-doctoral representative to Faculty, Physiology & Biophysics
2005 Co-organizer: Howard Hughes Medical Institute Future Faculty workshop
2008- K-12 science outreach: Future of Neurotechnology – Snohomish School District and University Child Development School
2011- Testbed Leader, NSF ERC in Sensorimotor Neural Engineering.

Research Funding

Current Funding

- 2009-2013 PI (20% time) Restoring movement following stroke: training spared cortical areas to control paralyzed muscles. American Heart & Stroke Association, NCRP Scientist Development Grant 09SDG2230091. Moritz (PI). \$70,000/year.
- 2009-2013 PI (20% time) Combined stem cell transplantation and targeted microstimulation to direct the formation of functional connections and neural repair. NIH/NINDS EUREKA R01 1R01NS066357. Moritz & Horner (multi-PI). \$200,000/year, Moritz Share \$100,000/year.
- 2011-2014 PI (5% time) NeuroGame Therapy to improve hand function following stroke. Bayley Family Stroke Care Fund in Rehabilitation Medicine. \$111,681.
- 2011-2013 Co-Investigator (1% time). Low Power Wireless Stimulation Chips for BCIs. Center for Sensorimotor Neural Engineering (CNSE) seed funding. CSNE-2011-6. Otis (PI). \$47,100/year.
- 2011-2013 Mentor (1% time). Closed Loop Neurostimulation for Psychiatric Disorders. Center for Sensorimotor Neural Engineering (CNSE) seed funding. CSNE-2011-6. Widge (Medical Resident Trainee). \$5,560/year.
- 2011-2013 Co-mentor (1% time). Optimizing BMI Design for Brain Adaptation. Center for Sensorimotor Neural Engineering (CNSE) seed funding. CSNE-2011-6. Matlack (Graduate Trainee). \$47,344/year.
- 2011-2016 Thrust-Leader (8% time). Center for Sensorimotor Neural Engineering (CNSE). National Science Foundation Engineering Research Center EEC-1028725. Daniel (PI). \$3.7M/year total; Moritz Share \$9,738/year.
- 2012-2013 PI (4% time) Automated NeuroGame Therapy after brain injury. Washington Research Foundation \$48,279
- 2012-2013 PI (5% time) Enhancing sensation following stroke. Bayley Family Stroke Care Fund in Rehabilitation Medicine. \$25,000.
- 2012-2013 Co-PI (1% time) Information coding and learning in brain-to-brain communication. UW Royalty Research Fund. Rao (PI) \$23,412.
- 2012-2014 PI (15% time) A Brain-Machine-Spinal Interface (BMSI) to replace and repair the injured nervous system. DARPA Young Faculty Award, D12AP00251. \$100,000/year.

- 2012-2014 Mentor (2% time) Light-activated interneuron transplants for targeted repair of the central nervous system. Sackler Scholars in Biophysics Postdoctoral Fellowship. \$50,000/year.
- 2013-2015 PI (2% time). A Brain-Machine-Spinal Interface (BMSI) to reanimate & rehabilitate the injured nervous system. Center for Sensorimotor Neural Engineering (CNSE). CSNE-2013-6. Ievins (Graduate Trainee). \$50,387/year.
- 2013-2015 PI (15% time) Synchronous stimulation and ChABC therapy to restore function after SCI. Neilsen Foundation Pilot Grant. \$136,000/year.

Pending Funding

- 2013-2015 PI (15% time) Intraspinal stimulation and CSPG disruption to promote recovery after SCI. NIH/NINDS R21. \$150,000/year.

Past Funding

- 2010-2011 PI (25% time). Administrative Supplement. NIH/NINDS EUREKA R01 1R01NS066357. Moritz (PI). \$50,000.
- 2009-2010 PI (16% time) Reconnecting the brain and spinal cord after injury via an autonomous electronic device. Univ. of Washington Royalty Research Fund # 4471. Moritz (PI). \$38,339.
- 2009-2010 PI (5% time) Rehabilitation gaming for improvement of neurological function & compliance with movement practice. Pacific Northwest Center for Neural Engineering. Moritz, McCoy, Flick (multi-PI). \$5,500.
- 2009-2010 PI (5% time) Neural control of a robotic finger: individual muscles vs. endpoint control. Pacific Northwest Center for Neural Engineering. Moritz & Matsuoka (multi-PI). \$4,980
- 2009-2010 Co-PI (2% time) Lower level feedback enhances brain computer: interface control of robots for grasping tasks. Pacific Northwest Center for Neural Engineering. Chizeck, Moritz, Smith (multi-PI). \$10,000
- 2010-2011 Co-PI (10% time), Rehabilitation gaming using wireless electromyography. Commercialization Gap Fund. University of Washington Center for Commercialization and Washington Research Foundation. Otis, Moritz & McCoy (multi-PI). \$44,275.
- 2011-2012 Co-PI (1% time). Rehabilitation gaming and upper extremity recovery after stroke: a pilot study. ITHS Washington Small Grant. McCoy, Moritz, Otis (co-PIs). \$10,000.

Past Training Grants

- 2005-2008 PI (100% time) Cortical signals restore functional muscle activation. NIH NINDS Ruth L. Kirschstein NRSA Individual Postdoctoral Fellowship F32NS5101 Moritz PI. \$149,772 total direct costs.
- 2002-2003 American Society of Biomechanics Graduate Student Grant-in-aid \$1,500

Bibliography

Peer-Reviewed Publications & Conference Proceedings (* indicates corresponding author)

1. Moritz, C. T.* & Farley, C. T. (2003) Human hopping on damped surfaces: strategies for adjusting leg mechanics. *Proceedings of the Royal Society of London, Series B*, 270, 1741-1746.
2. Moritz, C.T.* & Farley, C.T. (2004) Passive dynamics change leg mechanics for an unexpected surface during human hopping. *Journal of Applied Physiology*, 97 (4), 1313-1322.
3. Moritz, C. T.*, Greene, S.M., & Farley, C. T. (2004) Neuromuscular changes for hopping on a range of damped surfaces. *Journal of Applied Physiology*, 96 (5), 1996-2004.
4. Moritz, C. T.* & Farley, C. T. (2005) Human hopping on very soft surfaces: implications for muscle pre-stretch and elastic energy storage in locomotion. *Journal of Experimental Biology*, 208, 939-949.
5. Shinohara, M., Moritz, C. T., Pascoe, M.A., Enoka, R.M. (2005) Prolonged vibration increases stretch reflex amplitude, motor unit discharge rate, and force fluctuations in a hand muscle. *Journal of Applied Physiology* 99(5), 1835-1842.
6. Moritz, C. T.*, Christou, E. A., Meyer, F. G., Enoka, R. M. (2005) Coherence at 16-32 Hz can be caused by short-term synchrony of motor units. *Journal of Neurophysiology*, 94 (1), 105-118.
7. Moritz, C. T.*, Barry, B. K., Pascoe, M. A., Enoka, R. M. (2005) Discharge rate variability contributes to the variation in force fluctuations across the working range of a hand muscle. *Journal of Neurophysiology*, 93 (5), 2449-2459.
8. Moritz, C. T.* & Farley, C. T. (2006) Human hoppers compensate for simultaneous changes in surface compression and energy dissipation on heavily damped surfaces. *Journal of Biomechanics*, 39(6), 1030-1038.
9. Jackson, A., Moritz, C. T., Mavoori, J., Lucas, T. H., Fetz, E. E. (2006) The Neurochip BCI: towards a neural prosthesis for upper limb function. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*, 14(2), 187-190.
10. Moritz, C. T., Lucas, T. H., Perlmutter, S. I., Fetz, E. E. (2007) Forelimb movements and muscle responses evoked by microstimulation of cervical spinal cord in sedated monkeys. *Journal of Neurophysiology*, 97(1), 110-120.
11. Moritz, C. T.*, Perlmutter, S. I., Fetz, E. E. (2008) Direct control of paralyzed muscles by cortical neurons. *Nature*, 456, 639-642.
12. van der Krogt, M. M., de Graaf, W. W., Farley, C. T., Moritz, C. T., Casius, R. L. J., Bobbert, M. F. (2009) Robust passive dynamics of the musculoskeletal system compensate for unexpected surface changes in human hopping. *Journal of Applied Physiology* 107(3), 801-8.
13. Otis, B., Moritz, C., Holleman, J., Mishra, A., Pandey, J., Rai S., Yeager, D., Zhang, F. (2009) Circuit Techniques for Wireless Brain Interfaces. *IEEE Engineering in Medicine and Biology Society*, September 2009.

14. Moritz, C. T.* & Fetz, E. E. (2011) Volitional control of single cortical neurons in a brain-machine interface. *Journal of Neural Engineering*. 8 (2011) 025017.
15. Moritz, C.*, Morrison, T., Otis, B., Burt, J., Rios, D., Gilbertson, T., and McCoy, S. (2011) 'Neurogame therapy' for improvement of movement coordination after brain injury: Developing a wireless biosignal game therapy system. Proceedings of the IEEE Global Humanitarian Technology Conference, Seattle, WA.
16. Matlack, C., Moritz, C., and Chizeck, H. (2012) Applying Best Practices from Digital Control Systems to BMI Implementation. *IEEE Engineering in Medicine and Biology Society*.
17. Kasten M. R., Sunshine M.D., and Moritz C. T.* (2012). Cervical intraspinal microstimulation improves forelimb motor recovery after spinal contusion injury. International Functional Electrical Stimulation Society (iFESS).
18. Sunshine M. D., Cho F. S., Lockwood D. F., Fechko A. S., Kasten M. R., and Moritz C. T.* (2013) Cervical intraspinal stimulation evokes robust forelimb movements before and after injury. *Journal of Neural Engineering* 10 (2013) 036001.
19. Rios, D.C., Gilbertson, T., McCoy, S.W., Price, R., Gutman, K.F., Miller, K.E.F., Fechko, A., and Moritz, C. T.* (2013) NeuroGame Therapy to improve wrist control in children with cerebral palsy: A case series. *Developmental Neurorehabilitation*. Published Online April 25, 2013 (doi:10.3109/17518423.2013.766818).
20. Kasten M. R., Sunshine M. D., Secrist E., Horner P. J., and Moritz C. T.* Cervical intraspinal stimulation improves forelimb motor recovery after spinal contusion injury. *Journal of Neural Engineering*. In Press.

Book Chapters

1. Widge, A. S., Moritz, C. T. & Matsuoka, Y. (2010) Direct Neural Control of Anatomically Correct Robotic Hands. Pages 105-119 In: *(B+H)CI: The Human in Brain-Computer Interfaces and the Brain in Human-Computer Interaction*. Editors: Tan DS, Nijholt A. Springer, New York.

Other publications

1. Moritz, C. T.* (2009) A bounce in your step: some is good, more is not always better. *Journal of Applied Physiology* 107(3), 643-4. (Invited Editorial)

Manuscripts Submitted

1. Nutt, S.E., Chang, E-A., Suhr, S.T., Schlosser, L.O., Moritz, C. T., Cibelli, J. B., and Horner, P.J. (2012) Caudalized human iPSC-derived neural progenitor cells produce neurons and glia but fail to restore function in a chronic spinal cord injury model. Under Revision: *Experimental Neurology*. April 2, 2013
2. Donoso Brown, E., Westcott McCoy, S., Gilbertson, T., Price, R., Moritz, C. A Preliminary Investigation of Neurogame Therapy as a Home Program for Persons in the Chronic Phase of Stroke Recovery. Submitted to Archives of Physical Medicine and Rehabilitation. May 8, 2013.

Manuscripts in Preparation

1. Donoso Brown, E., Westcott McCoy, S., Dudgeon, B., Moritz, C. Understanding the Nature of Home Programs for Persons After Stroke. To be submitted to Archives of Physical Medicine and Rehabilitation.
2. Miller, K., Donoso Brown, E., Lindley, C., Westcott McCoy, Sally, Gilbertson, T., Price, R., Gutman, K., Moritz, C. Neurogame Therapy for upper extremity function in adults with traumatic brain injury and incomplete spinal cord injury. To be submitted to the Journal of Rehabilitation Research and Development (JRRD).

Published Abstracts

1. Moritz, C. T., Tu, M.S, Daniel, T.L. (1998) Temperature gradients in *Manduca* flight muscle mediate spatial gradients in force generation. American Zoologist. 35(5): 82A.
2. Moritz, C. T., Greene, S. M., & Farley, C. T. (2002) Neuromuscular adjustments for hopping on a heavily damped surface. IV World Congress of Biomechanics. Calgary.
3. Moritz, C. T. & Farley, C. T. (2003) Human hopping on very soft surfaces. American Society of Biomechanics. Toledo, OH.
4. Moritz, C. T. & Farley, C. T. (2003) Humans anticipate surface changes during bouncing gaits. American Society of Biomechanics. Toledo, OH
5. Moritz, C. T. & Farley, C. T. (2003) Neuromechanical anticipation and reaction during human locomotion. Society for Neuroscience, New Orleans, LA.
6. Shinohara, M., Moritz, C. T., Frigon, A., Enoka, R. M. (2004) Vibration - induced enhancement of the stretch reflex is accompanied by an increase in the force fluctuations for a hand muscle. Society for Neuroscience, San Diego, CA
7. Moritz, C. T., Christou, E. A., Meyer, F. G., Enoka, R. M. (2004) Time- and frequency-domain measures of motor unit synchronization. Society for Neuroscience, San Diego, CA
8. Christou, E. A., Rudroff, T., Moritz, C. T., Enoka, R. M. (2004) The variability in motor unit discharge is determined by low - frequency oscillations in discharge rate. Society for Neuroscience, San Diego, CA
9. Moritz, C. T., Barry, B. K., Pascoe, M. A., Enoka, R. M. (2005) Discharge rate variability is responsible for the variation in force fluctuations across the working range of a hand muscle. International Union of Physiological Sciences, San Diego, CA.
10. Moritz, C. T., Lucas, T. H., Perlmutter, S. I., Fetz, E. E. (2005) Output effects evoked by microstimulation of cervical spinal cord in sedated monkeys – implications for neuroprosthetic applications. Brain-Computer Interface Technology, Rensselaerville, NY
11. Lucas, T. H., Moritz, C. T., Perlmutter, S. I., Fetz, E. E. (2005) Forelimb movements and muscle responses evoked by microstimulation of cervical spinal cord in sedated monkeys. Society for Neuroscience, Washington DC.
12. Moritz, C. T., Zanos, S., Perlmutter, S. I., Fetz, E. E. (2006) Operant conditioning of pre- and post-central unit activity in forelimb area of monkey using biofeedback of discharge rate. Society for Neuroscience, Atlanta GA.

13. Moritz, C. T., McElwain, K. L., Perlmutter, S. I., Fetz, E. E. (2007) Monkeys use cortical activity to control electrical stimulation of paralyzed muscles. Society for Neuroscience, San Diego CA.
14. Moritz, C. T., Perlmutter, S. I., Fetz, E. E. (2008) Monkeys use cortical activity to control functional electrical stimulation of paralyzed muscles. Society for Neuroscience, Washington DC.
15. Zanos, S., Richardson, A., Shupe, L., Moritz, C., Nishimura Y., Miles, F., Perlmutter, S., Fetz, E. (2009) The Neurochip-2: An implantable system for recording neural and behavioral signals and delivering electrical stimuli in freely behaving monkeys. Society for Neuroscience, Chicago IL.
16. Fetz, E., Jackson, A., Moritz, C., Nishimura, Y., Lucas, T., Perlmutter, S. (2010) Learning and plasticity in neural populations with recurrent brain-computer interfaces. AREADNE - Research in Encoding And Decoding of Neural Ensembles. Santorini, Greece
17. Fetz, E. E., Perlmutter, S., Moritz, C. T. Nishimura, Y., Zanos, S., Richardson, A. Lucas, T., and Eaton, R. (2010) Applications of recurrent brain-computer interfaces. Fourth International Brain-Computer Interface Meeting, Asilomar, CA.
18. Moritz, C. T. & Fetz, E. E. (2010). Volitional control of cortical neurons. Fourth International Brain-Computer Interface Meeting, Asilomar, CA.
19. McCoy S., Lubetzsky-Vilnai A., Moritz C. (2011). Exploration of technology use for enjoyable task-specific practice to improve selective volitional muscle activation in children with cerebral palsy. World Physical Therapy, Amsterdam, Netherlands.
20. Gilbertson, T., Rios, D., Donoso Brown, E., Price, R., McCoy, S., Moritz, C. (2011) 'Neurogame' Therapy for Upper Extremity Function in Children with Cerebral Palsy. American Physical Therapy Association Combined Sections Meeting (APTA-CSM), Chicago, IL.
21. Widge AS, Fetz E, Moritz CT. Preliminary Validation of Closed-Loop Neurostimulation in Rat Models of Psychiatric Illness. (2011) American Psychiatric Association Meeting, Honolulu, HI, May 14-18, 2011.
22. Moritz, C.T. (2011) Neuroprosthetic approaches to the treatment of spinal cord injury in *International Spinal Research Trust Network Meeting*. London, UK.
23. Moritz, C.T. (2011) Leveraging neural plasticity for the treatment of paralysis and other movement disorders in *International Symposium on Neural Regeneration*. Asilomar, CA.
24. Widge AS, Moritz CT. (2012) Operant conditioning of frontal-limbic pathways in rodents: first steps towards a closed-loop psychiatric neural prosthesis. In 2012 American Psychiatric Association Meeting, Philadelphia, PA, May 6-10, 2012
25. Miller, Katherine; Donoso Brown, Elena; Westcott McCoy, Sally; Gilbertson, Torey; Price, Robert; Gutman, Karli; Moritz, Chet (2012). Neurogame Therapy for upper extremity function in adults with stroke and traumatic brain injury. Combined Sections Meeting (CSM) of the American Physical Therapy Association (APTA), San Diego, CA, January 2012.
26. Gutman, Karli; Donoso Brown, Elena; Moritz, Chet; Rios, Dianne; Gilbertson, Torey; Miller, Katherine; Price, Robert; Westcott McCoy, Sally (2012). Differences in motor coordination between adults post stroke with or without sensory loss. Combined

Sections Meeting (CSM) of the American Physical Therapy Association (APTA), San Diego, CA, January 2012.

27. Matlack, C., Chizeck, H. Moritz, C. (2013) Correctly Applying Performance Metrics to Neuroprosthetic Control Interfaces. 5th International Brain-Computer Interface Meeting. Asilomar, CA, June 2013.
28. Widge AS, Moritz CT. (2013) Rodent Proof of Concept for a Patient-Controllable Brain Stimulator (Closed-Loop Limbic Prosthesis). In 2013 Society of Biological Psychiatry Meeting, San Francisco, CA, May 16-18, 2013.

National and International Invitational Lectures

Keynote Speaker, University of Calgary Medical Science symposium (2009) *A brain-machine interface for the treatment of paralysis.*

Presidential Lecture, Association for Applied Psychophysiology & Biofeedback (2009) *Direct control of paralyzed muscles by cortical neurons: Implications for biofeedback in the treatment of paralysis.* Albuquerque, NM

Symposium speaker, International Spinal Research Trust Network Meeting, London, UK (2011) *Neuroprosthetic approaches to the treatment of SCI.*

Symposium Speaker, International Symposium on Neural Regeneration (2011) *Leveraging neural plasticity for the treatment of paralysis and other movement disorders.* Asilomar, CA.

Keynote Address, Association for Applied Psychophysiology & Biofeedback (2013) *Neural Devices and Biofeedback for Rehabilitation of the Damaged Central Nervous System.* Portland, OR.

Plenary Presentation, International Collaboration on Repair Discoveries (ICORD) Trainee Symposium (2013), *Neural engineering techniques to activate and rehabilitate the injured spinal cord,* Vancouver, BC

National and International Presentations

Dept. of Integrative Physiology, Univ. of Colorado (2003) *Control and mechanics of bouncing gaits on natural surfaces.*

School of Kinesiology, Simon Fraser University (2005) *Challenges in reanimating the limbs after spinal cord injury: the interplay of biomechanics & neural control.*

Dept. of Cell Biology and Neuroscience, Univ. of Alberta (2007) *Toward a neuroprosthetic for reanimating paralyzed limbs.*

Dept. of Biology, Psychology and Behavioral Neuroscience, Western Washington Univ. (2010). *Promoting neural plasticity for the treatment of paralysis and other movement disorders.*

The Northwest Intermountain consortium (NIC) of Physical Therapy Clinical Education Conference (2011). *Translating pathophysiology knowledge into physical therapy practice.*

Neurosurgery Grand Rounds, University of Kansas Medical School (2011). *Developing neuroprosthetics for the treatment of paralysis following CNS injury.*

International Functional Electrical Stimulation Society (2012). *Cervical intraspinal microstimulation improves forelimb motor recovery after spinal contusion injury.* Banff, CA

DARPA RE-NET PI meeting (2012) *A Brain-Machine-Spinal Interface (BMSI) to replace and repair the injured nervous system*. New Orleans, LA.

Local Presentations

Neurobiology and Behavior, Univ. of Washington (2007) *Toward a neuroprosthetic for reanimating paralyzed limbs*.

H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2007) *Using brain activity to control stimulation of paralyzed muscles*.

Computational Neuroscience Connection, University of Washington (2009) *Brain-machine interfaces: Giving priority to the most intelligent controller*.

H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2009) *Leveraging technology for the treatment of movement disorders*.

Department of Rehabilitation Medicine, University of Washington (2009) *Neuroprosthetic technology for the treatment of movement disorders*.

Department of Rehabilitation Medicine, University of Washington (2010) *Developing technology for the treatment of movement disorders*.

H.D. Patton Symposium, Physiology and Biophysics, Univ. of Washington (2010) *Promoting neural plasticity for the treatment of movement disorders*.

Grand Rounds, Department of Rehabilitation Medicine, University of Washington (2010) *Shaping neural activity for the treatment of paralysis and other movement disorders*.

UW TAPAS, South Lake Union Seminar Series (2011) *Promoting neural plasticity for the treatment of movement disorders*

Northwest Regional Spinal Cord Injury System, Consumer Forum (2011) *Developing neuroprosthetic treatments for spinal cord injury*

Pacific Northwest American Academy of Orthotists and Prosthetists Annual Meeting (2011) *Brain Computer Interfaces (BCI): Implications for the Future of Prosthetics & Orthotics*.

Harborview Medical Center Department of Rehabilitation Therapies Stroke Symposium (2011) *Computer Brain Interfaces for Stroke Rehabilitation*.

Neurobiology and Behavior program, Univ. of Washington (2011) *Leveraging neural plasticity for the treatment of paralysis and other movement disorders*.

UW Medicine SCI Core Group (2012) *Electrostimulation methods for spinal cord rehabilitation*.

UW Institute for Stem Cell and Regenerative Medicine, Symposium on Neural Regeneration: Cell engineering to cell therapy (2012) *Can neural devices replace or repair the damaged CNS?*

Center for Sensorimotor Neural Engineering (2012) *Neural Engineering to Replace, Repair, and Rehabilitate the Central Nervous System*.

Justus F. Lehman Day (2012) *Neural Technology to Rehabilitate, Replace, or Regenerate the Damaged Central Nervous System*.

Seattle Public Library (2012) Neuroscience community outreach. *Brain-Computer Interfaces to replace or repair the injured central nervous system*.

Electrode workshop: Center for Sensorimotor Neural Engineering (2013) *Cortical Recording Performance and Neuroprosthetic Applications*.

International Symposium on Cognitive Neuroscience Robotics (2013) *Intraspinal stimulation for re-animation and repair of the injured spinal cord.*

TriBeta Undergraduate Biology Club, Department of Biology (2013) *Neuroprosthetic Technology: Treatment of paralysis and other movement disorders.*

Center for Integrative Brain Research, Seattle Children's Research Institute (2013). *Neural Devices for Rehabilitation of the Injured Central Nervous System.*

Trainees and Students Mentored in Research Laboratory

Post-doctoral fellows

Sarah Mondello, PhD (co-mentor with Phil Horner)

Dianne Rios, PhD (co-mentor with Sarah McCoy)

PhD students

Charlie Matlack (Electrical Engineering, co-mentor with Howard Chizeck)

Elena Donoso-Brown (Rehabilitation Sciences, co-mentor with Sally McCoy)

Aiva levins (Neurobiology & Behavior; co-mentor with Phil Horner)

Torey Gilberston (Rehabilitation Sciences, co-mentor with Sally McCoy)

Medical Residents

Alik Widge (Psychiatry)

Medical Students

Curt Lindley (UW School of Medicine)

Behnum Habibi (Case Western Reserve School of Medicine)

Physical Therapy Students

Karli Gutman (UW DPT Program)

Katherine Miller (UW DPT Program)

Julia Selander (UW DPT Program)

Undergraduate Students

Eric Secrist (UW Biology)

Peter Kim (UW Biology)

Ryan Miller (UW Biology)

Nathaniel Cook (UW Biology)

David Boe (UW Neurobiology)

Anand Kaul (UW Molecular & Cell Biology)

Tia Secasiu (UW Molecular & Cell Biology)

Frances Cho (Columbia Neuroscience)

Danielle Lockwood (Arizona Bioengineering)

Ryan Carlson (UW Biology)

Comron Ganji (UW Biology)

Alice Bosma-Moody (UW Bioengineering)

Jan Jimenez (UW Freshman undeclared)

Reni Magbagbeola (UW Freshman)