

Curriculum Vitae

Date: 2023.04.26

Name: Jacob Graves McPherson, PhD

Contact Information:

Address, Telephone and email:

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 - 314-273-1183
 - 4444 Forest Park Ave., Campus Box 8502; St. Louis, MO 63108
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Present Position:

2019 - present Assistant Professor (*Investigator track – tenure earning*)
 Program in Physical Therapy, Department of Anesthesiology
 Washington University School of Medicine; St. Louis, MO

Education:

2005 **B.S.** – Biomedical Engineering, Applied Sciences
 University of North Carolina, Chapel Hill, NC

2008 **M.S.** – Biomedical Engineering
 Northwestern University, Evanston, IL

2011 **Ph.D.** – Biomedical Engineering
 Northwestern University, Evanston, IL
Thesis: McPherson JG (2011). *A quantitative and neuropharmacological investigation of mechanisms underlying upper limb movement abnormalities in individuals with chronic hemiparetic stroke*. ProQuest Dissertations and Theses, No. 3488499.
Advisor: Julius P.A. Dewald, P.T., Ph.D.

2011 - 2013 **Post-doctoral Fellowship:** Physiology and Biophysics (Neurophysiology)
 University of Washington School of Medicine, Seattle, WA

2013 - 2015 **Post-doctoral Fellowship:** Physical Therapy, Phys. Med. And Rehabil.
 Northwestern University Feinberg School of Medicine, Chicago, IL

Academic Positions / Employment:

2004 **Undergraduate Research Assistant**
 University of North Carolina, Chapel Hill, NC

2005 - 2011 **Graduate Research Assistant**

Northwestern University Feinberg School of Medicine, Chicago, IL

- 2011 - 2013 **Senior Fellow** (post-doctoral)
University of Washington School of Medicine, Seattle, WA
- 2012 - 2013 **Sackler Scholar of Integrative Biophysics**
University of Washington School of Medicine, Seattle, WA
- 2013 - 2015 **Post-doctoral Fellow**
Northwestern University Feinberg School of Medicine, Chicago, IL
- 2015 - 2019 **Assistant Professor** (tenure earning)
Department of Biomedical Engineering
Florida International University, Miami, FL
- 2015 - **Graduate Faculty Status**
Florida International University, Miami, FL
- 2019 - **Assistant Professor**
Program in Physical Therapy, Department of Anesthesiology;
Affiliate Faculty: Department of Biomedical Engineering;
Faculty: Washington University Pain Center, Program and Neurosciences
Washington University School of Medicine, St. Louis, MO

Clinical Title and Responsibilities: N/A

Teaching Title and Responsibilities:

Courses Taught:

Washington University in St. Louis:

MSP Curriculum:

- *MSP Program Seminar*
- *MSP Biocontrol*
- *MSP Bio-Instrumentation* (co-course master)

DPT Curriculum:

- *Diagnosis and Evidence Analysis III*
- *Neuroscience*: guest lecturer

Florida International University (2015 – 2019):

- *BME 3403*: Engineering Analysis of Biological Systems
- *BME 5411*: Biomedical Physiology and Engineering II
- *BME 4211*: Orthopedic Biomechanics
- *BME 4908*: Biomedical Engineering Senior Design

University, School of Medicine and Hospital Appointments and Committees:

Washington University:

- 2019 - 2020 Dept. of Biomedical Engineering Faculty Search Committee
- 2019 - Dept. of Biomedical Engineering PhD program applicant reviewer

Washington University School of Medicine:

- 2019 - Program in Physical Therapy MSP PhD program applicant reviewer
- 2020 - Program in Physical Therapy, co-lead: Pain Thread
- 2022 - Program in Physical Therapy, DPT student coaching

Florida International University:

- 2015 - 2017 **Dept.** of Biomedical Engineering Seminar Series Committee
- 2015 - 2019 **Dept.** of Biomedical Engineering Graduate Program Committee
- 2016 - 2019 **College** of Engineering and Computing Scholarship Committee
- 2017 - 2019 **College** of Engineering and Computing Faculty Council (*Secretary*)
- 2018 - 2019 **University** Provost's Leadership in Evaluating Teaching Committee

Medical Licensure and Certification: N/A

Military Service: N/A

Honors and Awards:

- 2011 Finalist, Best Student Paper. *IEEE International Conference on Rehabilitation Robotics*. Zurich, CH, 2011.
- 2015 Research featured in *IEEE Spectrum*: "Stimulating damaged spines rewires rats for recovery." Sept 14th, 2015.

- 2015 Research featured in *Medical Xpress*: “New electrostatic stimulation technique improves damaged nerve function in rats.” Sept 15th, 2015.
- 2015 Research featured in *Nature*: “Electric zaps help spinal-cord rehab.” 525: 428. Sept 24, 2015.
- 2015 Research featured in *Nature*: Nudo, RJ. “Rehabilitation: Boost for movement.” *Nature*, 527: 314-315, Sept 19th, 2015.
- 2015 Research featured: Ozpinar A, Tempel ZJ, Monaco EA 3rd. “Targeted, activity-dependent spinal stimulation produces long-lasting motor recovery in chronic cervical spinal cord injury.” Commentary in *Neurosurgery*. 2016 Feb; 78(2): N18-9. doi: 10.1227/01.neu.0000479893.25489.47.
- 2018 Research featured: “New insights into stroke treatment.” *Medindia*. Feb. 16th, 2018.
- 2018 Research featured: “Study could lead to new therapies to improve movement control in stroke survivors.” *The Medical News*. Feb. 16th, 2018.
- 2018 Research featured: “New research on the brain’s backup motor systems could open door to novel stroke therapies.” *EurekaAlert!* (American Association for the Advancement of Science; AAAS). Feb. 14th, 2018.
- 2018 – 2019 Top cited article of 2018 – 2019, *The Journal of Physiology*.
- 2023 Research featured: “Zeroing in on neuropathic pain in spinal cord injury: partnerships in the modern research community.” *Department of Defense Congressionally Directed Medical Research Program – Spinal Cord Injury Directorate*.

Editorial Responsibilities:

- 2016 - **Section Editor:** *Spinal Interfaces*; *The Encyclopedia of Computational Neuroscience*. Jaeger D and Jung R, eds. Springer, NY. ISBN: 978-1-4614-6676-5
- 2005 - **Reviewer, ad-hoc** (non-exhaustive): *eLife*, *Cell Reports Methods*, *Neuron*, *Current Biology*, *Journal of Physiology*, *Brain Stimulation*, *Experimental Neurology*, *Journal of Neural Engineering Neurorehabilitation and Neural Repair*, *Journal of Neurophysiology*, *Journal of Orthopaedic and Sports Physical Therapy*, *IEEE Transactions on Neural Systems and*

Rehabilitation Engineering, Journal of Neuroengineering and Rehabilitation, Archives of Physical Medicine and Rehabilitation; Journal of Electromyography and Kinesiology, Scientific Reports,

- 2017 - **Reviewer pool:** National Science Foundation
- 2019 - **Reviewer pool:** National Institutes of Health
- 2020 - **Ad-hoc reviewer:** NIH BNVT study section
- 2022 - **Ad-hoc reviewer:** NIH ICN/IFCN study sections
- 2022 - **Ad-hoc reviewer:** VA Rehabilitation Research and Development grants

National Panels, Committees, Boards: N/A

Community Service Contributions:

Professional Societies and Organizations

- 2017 - Society for Neuroscience
- 2016 - 2017 International Association for the Study of Pain
- 2017 - International Society of Motor Control
- 2018 - International Motoneuron Society
- 2018 - American Heart Association

Major Invited Professorships and Lectureships:

- 2012 A novel, physiologically based intervention for motor rehabilitation following spinal cord injury. *HD Patton Society Symposium*. Leavenworth, WA; September 14th, 2012.
- 2013 Targeted, activity-dependent spinal stimulation for motor rehabilitation following spinal cord injury. *Northwestern University Feinberg School of Medicine Grand Rounds, Department of Physical Therapy and Human Movement Sciences*. Chicago, IL; April 23rd, 2013.
- 2013 Targeted, activity-dependent spinal stimulation for motor rehabilitation following spinal cord injury. *3rd Annual Sackler Biophysics Symposium*. Seattle, WA; June 6th, 2013.

- 2014 Integrating technology with physiology to drive novel neurorehabilitation interventions. *Florida International University, Wallace H. Coulter Foundation and Department of Biomedical Engineering Seminar Series*. Miami, FL; May 12th, 2014.
- 2016 MRI and spinal cord injury edema: a biomarker for walking with potential predictive ability? *13th Annual Society of Brain Mapping and Therapeutics World Congress*. Miami, FL; April 9th, 2016.
- 2016 Neuroprosthetics to drive activity-dependent plasticity. *1st Annual Neural Engineering Research Symposium, University of Miami and the Miami Project to Cure Paralysis*. Miami, FL; Oct. 13th, 2016.
- 2017 Altered neuromodulatory drive post-stroke: evidence and implications. *University of Florida, Rehabilitation Science Seminar Series*. Gainesville, FL; February 22nd, 2017.
- 2017 Neuroprosthetics for plasticity-based sensorimotor recovery. *Northwestern University Feinberg School of Medicine Movement and Rehabilitation Sciences Training Day*. Chicago, IL; August 25th, 2017.
- 2018 Hebbian-type neural plasticity in spinal sensorimotor circuits. *International Motoneuron Society Conference*. Boulder, CO. June 11-14, 2018.
- 2018 Neuroprosthetics for plasticity-based multimodal rehabilitation. *Progress in Clinical Motor Control: Neurorehabilitation I*. State College, PA. July 23-25, 2018.
- 2018 Spinal neuromodulation for plasticity-based, multimodal rehabilitation. *American Society of Neurorehabilitation Annual Meeting*. San Diego, CA. October 31st, 2018.
- 2018 Therapeutic intraspinal microstimulation to rebalance transmission in motor and pain pathways after spinal cord injury. *Drexel University College of Medicine, Department of Neurobiology and Anatomy Seminar Series*. Philadelphia, PA; November 14th, 2018.
- 2018 Leveraging the interconnectivity of spinal motor and pain pathways to drive multi-modal rehabilitation. *University of Florida, Department of Applied Physiology and Kinesiology Seminar Series*. Gainesville, FL; December 10th, 2018.
- 2018 Therapeutic intraspinal microstimulation to rebalance transmission in motor and pain pathways after spinal cord injury. *University of Miami, Department of Biomedical Engineering Seminar Series*. Miami, FL; December 12th, 2018.

- 2019 Leveraging the interconnectivity of spinal motor and pain pathways to drive multi-modal rehabilitation. *Resident Research Day Keynote Address*. Larkin Community Hospital Physical Medicine and Rehabilitation. Miami, FL. June 3rd, 2019.
- 2020 Activity-dependent plasticity in spinal sensorimotor circuits: from basic science to clinical relevance. *Annual Spinal Cord Plasticity Meeting (Sponsors: National Center for Neuromodulation for Research and National Center for Adaptive Neurotechnologies)*. Charleston, SC. March 23rd, 2020 (postponed due to SARS-COV-2; delivered December 2020).
- 2021 Spontaneous neural synchrony links intrinsic spinal sensory and motor networks during unconsciousness: implications for plasticity-promoting interventions. *Washington University School of Medicine in St. Louis Department of Anesthesiology Seminar Series*.
- 2022 It's not a matter of if, but when: spatial vs. temporal specificity for plasticity-promoting spinal neuromodulation. *Spinal Cord Plasticity in Motor Control Meeting: Neuromodulation for Engaging and Enhancing Spinal Cord Plasticity*. November 11th, 2022. San Diego, CA. Sponsored by the National Center of Neuromodulation for Rehabilitation (P2C HD086844) and the National Center for Adaptive Neurotechnologies (P41 EB018783).
- 2023 A matter of 'if' not 'when'? Spatial and temporal specificity for plasticity-promoting spinal neuromodulation. *Arizona State University Department of Biomedical Engineering Seminar Series*. April 21st, 2023. Tempe, AZ.
- 2023 Zombie cats, cyborg rats, and monkeys with computer chip hats: just another day in the clinic? *Progress in Clinical Motor Control Meeting*. July 13-15th, 2023. Chicago, IL.

Research Support:

Past

Governmental

R01 NS054269	Dewald (PI)	09/01/2005 - 05/31/2010
NINDS		\$1,150,031
Title: " <i>Monoaminergic drive and discoordination following stroke.</i> "		
Role: Graduate research associate		
R01 HD079076-01A1	Elliott (PI)	12/01/2014 - 05/01/2015
NICHD		\$1,258,840
Title: " <i>Neuromuscular mechanisms underlying poor recovery from whiplash injuries.</i> "		

Role: Post-doctoral research associate

K12HD073945 Dewald, **McPherson JG** (PI) 01/01/2017 - 06/30/2018
 NICHD IRE-K12 Program \$187,500
 Title: "*Spinal stimulation for neuropathic pain.*"
 Role: Scholar/Principal Investigator of individual award under parent K12 (PI, Dewald)

Non-governmental

Scholar of Integrative Biophysics **McPherson JG** (PI) 01/01/2012 - 10/01/2013
 Raymond and Beverly Sackler Foundation \$89,333
 Title: "*Development of flexible, biocompatible electrode arrays for chronic stimulation of the central nervous system following neurological injury.*"
 Role: Principal Investigator

SEED Grant **McPherson JG** (multi-PI) 5/01/2017 - 04/30/2018
 Wallace H. Coulter Foundation \$25,000
 Title: "*Exploring Neural Contributions to Aortic Valve Function and Disease*"
 Role: Principal Investigator

SEED Grant **McPherson JG** (Multi-PI) 06/21/2018 – 06/20/2019
 Wallace H. Coulter Foundation \$59,952.34
 Title: "*Non-invasive decoding of neuromuscular activity for rehabilitation and prosthetic control.*"
 Role: Principal Investigator

SCIRTS Grant 460399 Danziger and **McPherson** 07/31/2017 - 06/30/2021
 Craig H. Neilsen Foundation \$321,000
 Title: "*Post-SCI bladder reflex conditioning with pelvic neuromodulation.*"
 Role: Co-Principal Investigator

Present

Governmental

5 R01 NS11234-04 **McPherson JG** (PI) 03/15/2019 – 02/29/2024
 NINDS \$1,142,506
 Title: "*Intraspinal microstimulation for multi-modal rehabilitation.*"
 Role: Principal Investigator

3 R01 NS11234-04S1 **McPherson JG** (PI) 05/04/2022 – 05/03/2023
 NINDS \$78,750
 Title: "*Intraspinal microstimulation for multi-modal rehabilitation.*" – Research supplement to promote retention.
 Role: Principal Investigator

3 R01 NS11234-04S2 **McPherson JG** (PI) 05/05/2022 – 05/04/2023*
 NINDS \$62,950/annual
 Title: “*Intraspinal microstimulation for multi-modal rehabilitation.*” – Research supplement to promote diversity in health-related research. *renewable
 Role: Principal Investigator

W81XWH-22-1-1100 **McPherson JG**, Thompson AK (MPI) 09/30/2022 – 09/30/2025
 DoD \$1,222,964
 Title: “*Targeted spinal cord plasticity for alleviating SCI-related neuropathic pain.*”
 Role: Principal Investigator

Non-governmental

19IPLOI34760603 **McPherson JG** (PI) 07/01/2019 – 06/30/2021 (NCE)
 American Heart Association Innovative Project Award \$199,998
 Title: “*Restorative neuroplasticity in brainstem motor pathways to enhance rehabilitation post-stroke.*”
 Role: Principal Investigator

19IPLOI34760603-S1 **McPherson JG** (PI) 07/01/2021 – 06/30/2022 (NCE)
 American Heart Association Innovative Project Award \$45,455
 Title: “*Restorative neuroplasticity in brainstem motor pathways to enhance rehabilitation post-stroke.*” Research supplement
 Role: Principal Investigator

Trainee/Mentee/Sponsorship Record:

Senior scientists

2023 - Leila Etemadi, PhD
 Mentor: Jacob McPherson, PhD
 Discipline: Neurophysiology and neurorehabilitation engineering

Post-doctoral Fellows

2017 - 2018 Behdad Tahayori, PT, PhD
 Mentor: Jacob McPherson, PhD
 Discipline: Neurophysiology and neurorehabilitation engineering

2023 - Javier de Lucas Romero, PhD
 Mentor: Jacob McPherson, PhD
 Discipline: Neurophysiology and neurorehabilitation engineering

PhD students

2014 - 2016 Andrew Smith, PT, PhD

Advisor: James Elliott, PT, PhD
Program: Northwestern University Neuroscience Program
Role (if not advisor): Dissertation Committee Member
Current position: Assistant Professor, Regis University

2015 - 2019 Ricardo Siu

Advisor: Ranu Jung, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member
Current position: post-doctoral fellow

2015 - 2020 Andres Peña

Advisor: Ranu Jung, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member

2017 - 2020 Ilian Black

Advisor: Ranu Jung, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member

2016 - 2021 Lakshmini Balachandar

Advisor: Jorge Riera, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member

2016 - 2021 Md Ashfaq Ahmed

Advisor: Ranu Jung, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member

2017 - 2021 Arezoo Pour

Advisor: Zachary Danziger, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member

2017 - 2022 Carolina Moncion

Advisor: Jorge Riera, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member

2017 -

Maria Bandres
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering, 2017-2019; Washington University Biomedical Engineering, beginning Fall 2019.

- 2018 - 2021 Megan Buchanan
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering, 2018-2019; Washington University Biomedical Engineering, beginning Fall 2019. Left laboratory June 1st, 2021.
- 2019 - 2022 Sathyakumar Kuntaegowdanahalli
Advisor: Ranu Jung, PhD
Program: FIU Biomedical Engineering
Role (if not advisor): Dissertation Committee Member
- 2022 - Jacob Parsons
Advisor: Gretchen A Meyer, PhD
Program: WUSM MSP PhD Program
Role (if not advisor): Dissertation Committee Member
- 2023 - Gerson Moreno Romero
Advisor: Jacob McPherson, PhD
Program: Washington University Biomedical Engineering
- 2023 - Avery Twyman
Advisor: Jacob McPherson, PhD
Program: Washington University Biomedical Engineering

MS students

- 2016 - 2018 Vivian Soliz, BS, MS
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering (Professional Track)
- 2016 - 2017 Daniel Duben, BS, MS
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering (Professional Track)
- 2016 - 2017 Nathalie Brossard, BS, MS
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering (Professional Track)
- 2016 - 2017 Luis Barreto, BS, MS
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering (Professional Track)
- 2017 Alexander Copa, BS, MS
Advisor: Jacob McPherson, PhD
Program: FIU Biomedical Engineering (Professional Track)

2018 - Rabeya Zinnat Adury
 Advisor: Ranu Jung, PhD
 Program: FIU Biomedical Engineering (Research Track)
 Role (if not advisor): Thesis Committee Member

2018 - 2020 Lorraine Campos
 Advisor: Jacob McPherson, PhD
 Program: FIU Biomedical Engineering (Research Track)

Undergraduate students

2015 - Valentina Melero
 Program: FIU Biomedical Engineering; Coulter Undergraduate Research
 Excellence Program Fellow

2016 - 2017 Kelly Rojas
 Program: FIU Biomedical Engineering; Ronald E. McNair Post-
 baccalaureate Achievement Program Scholar

2017 - Rayniel Perez, BS
 Program: FIU Biomedical Engineering

2017 - Afra Toma, BS, MS
 Program: FIU Biomedical Engineering
 Current position: Georgia Tech/Emory BME PhD Program

2023 - Jane Wu
 Program: Washington University Biochemistry, Global Health, and
 Environmental Anthropology

Patents: N/A

Bibliography:

Peer-reviewed articles

1. **McPherson JG**, Ellis MD, Heckman CJ, Dewald JPA (2008). Evidence for increased activation of persistent inward currents in individuals with chronic hemiparetic stroke. *J Neurophysiol.* 2008 Dec; 100(6): 3236-3243. DOI: 10.1152/jn.90563.2008
2. Stienen AH, **McPherson JG**, Schouten AC, Dewald JPA (2011). The ACT-4D: a novel rehabilitation robot for the quantification of upper limb motor impairments following brain injury. *IEEE Int Conf Rehabil Robot.* 2011:5975460. DOI: 10.1109/ICORR.2011.5975460.

3. **McPherson JG**, Stienen AH, Drogos JM, Dewald JPA (2011). The relationship between the flexion synergy and stretch reflexes in individuals with chronic hemiparetic stroke. *IEEE Int Conf Rehabil Robot*. 2011: 5975516. DOI: 10.1109/ICORR.2011.5975516.
4. **McPherson JG**, Edwards WB, Prasad A, Troy KL, Griffith JW, Schnitzer TJ (2014). Dual energy x-ray absorptiometry of the knee in individuals with spinal cord injury: methodology and correlation with quantitative computed tomography. *Spinal Cord*. 2014 Nov; 52(11): 821-825. DOI: 10.1038/sc.2014.122.
5. Smith AC, Parrish TB, Hoggarth MA, **McPherson JG**, Tysseling VM, Wasielewski M, Kim HE, Hornby TG, Elliott JM (2015). Potential associations between chronic whiplash and incomplete spinal cord injury. *Spinal Cord Ser Cases*. 2015; 1. pii: 15024. PMID: 27630770.
6. **McPherson JG**, Miller RR, Perlmutter SI (2015). Targeted, activity-dependent spinal stimulation produces long-lasting motor recovery in chronic cervical spinal cord injury. *Proc Natl Acad Sci USA*. 2015 Sept 29; 112(39): 12193-12198. DOI: 10.1073/pnas.1505383112.
7. Smith AC[§], Knikou M, Yelick K, Alexander A, Murnane M, Kristelis A, Houmpavlis P, **McPherson JG**, Wasielewski M, Hoggarth M, Elliott (2016). MRI measures of fat infiltration in lower extremities following motor incomplete spinal cord injury: reliability and potential implications for muscle activation. *Conf Proc IEEE Eng Med Biol Soc*. 2016 Aug; 2016:5451-5456. DOI: 10.1109/EMBC.2016.7591960.
8. Elliott JM, Sudarshan D, Haxie C, Hoggarth M, **McPherson JG**, Sparks C, Weber K (2016). Advancements in imaging technology: do they (or will they) equate to advancements in our knowledge of recovery in whiplash? *J Orthop Sports Phys Ther*. 2016 Oct; 46(10):862-873. PMID: 27690846.
9. Smith AC, Weber KA, Parrish TB, Hornby TG, Tysseling VM, **McPherson JG**, Wasielewski M, Elliott JM (2017). Ambulatory function in motor incomplete spinal cord injury: a magnetic resonance imaging study of spinal cord edema and lower extremity muscle morphometry. *Spinal Cord*. 2017 Jul; 55(7): 672-678. DOI: 10.1038/sc.2017.18.
10. **McPherson JG**, Stienen AH, Drogos JM, Dewald JPA (2017). Modification of spastic stretch reflexes at the elbow by flexion synergy expression in individuals with chronic, hemiparetic stroke. *Arch Phys Med Rehabil*. 2018 Mar; 99(3): 491-500; Epub 2017 Jul 24. DOI: 10.1016/j.apmr.2017.06.019.
11. **McPherson JG**, Chen A, Ellis MD, Yao J, Heckman CJ, Dewald JPA (2018). Progressive recruitment of contralesional cortico-reticulospinal pathways drives

- impairment post-stroke. *J Physiol.* 2018 Apr 1; 596(7):1211-1225. DOI: 10.1113/JP274968.
12. **McPherson JG**, McPherson LM, Thompson CK, Ellis MD, Heckman CJ, Dewald JPA (2018). Altered neuromodulatory drive may contribute to exaggerated tonic vibration reflexes in chronic hemiparetic stroke. *Front Hum Neurosci.* 2018 Apr 9; 12:131. DOI: 10.3389/fnhum.2018.00131.
 13. **McPherson JG**, Ellis MD, Harden RN, Carmona C, Drogos JM, Heckman CJ, Dewald JPA (2018). Neuromodulatory inputs to motoneurons contribute to the loss of independent joint control in chronic moderate to severe hemiparetic stroke. *Front Neurol.* 2018 Jun 21; 9:470. DOI: 10.3389/fneur.2018.00470.
 14. **McPherson JG***, Smith AC, Duben D, Wasielewski M, McMahan K, Parrish TB, Elliott JM (2018). Short- and long-term reproducibility of diffusion-weighted magnetic resonance imaging of lower extremity musculature in asymptomatic individuals and a comparison to individuals with spinal cord injury. *BMC Musculoskeletal Disorders.* 2018 Dec 6th; 19:443. DOI: 10.1186/s12891-01802361-7.
 15. **McPherson JG**, Stienen AH, Schmit BD, Dewald JPA (2018). Biomechanical parameters of the elbow stretch reflex in chronic hemiparetic stroke. *Exp. Brain Res.* 2018 Oct 1st; DOI: 10.1007/s00221-018-5389-x.
 16. **McPherson JG***, Smith AC, Duben D[†], Wasielewski M, McMahan K, Parrish TB, Elliott JM (2018). Short- and long-term reproducibility of diffusion-weighted magnetic resonance imaging of lower extremity musculature in asymptomatic individuals and a comparison to individuals with spinal cord injury. *BMC Musculoskeletal Disorders.* 2018 Dec 6th; 19:443. DOI: 10.1186/s12891-01802361-7.
 17. **McPherson JG**, Chen A, Ellis MD, Yao J, Heckman CJ, Dewald JPA (2019). Response to Letter to the Editor. *J Physiol.* 2019 Aug; 597(16): 4413-4414; DOI: 10.1113/JP278464.
 18. **McPherson JG***, Bandres MF[†] (2021). Spontaneous neural synchrony links intrinsic spinal sensory and motor networks during unconsciousness *eLife.* 2021;10:e66308 DOI: 10.7554/eLife.66308. [†]student author; *corresponding author.
 19. Bandres, MF[†], Gomes, J., **McPherson, JG*** (2021). Spontaneous multimodal neural transmission suggests that adult spinal networks maintain an intrinsic state of readiness to execute sensorimotor behaviors. *J Neurosci,* doi:10.1523/JNEUROSCI.0662-21.2021. [†]student author; *corresponding author.

20. Bandres MF[†], Gomes JL, **McPherson JG*** (2022). Spinal stimulation for motor rehabilitation immediately modulates nociceptive transmission. *J Neural Engineering*. doi: 10.1088/1741-2552/ac9a00 †student author; *corresponding author.
21. Bandres MF¹, Gomes J, Moreno-Romero GN¹, Twyman AR¹, **McPherson JG*** (2023) Precision neuromodulation: promises and challenges of spinal stimulation for multi-modal rehabilitation. *Front. Rehabil. Sci.*, 4; DOI: 10.3389/fresc.2023.1135593. *corresponding author; ¹doctoral student trainee.
22. Bandres MF[†], Gomes JL, **McPherson JG*** (2023). Motor-targeted spinal stimulation promotes concurrent rebalancing of pathologic nociceptive transmission in chronic spinal cord injury. *bioRxiv*. DOI: <https://doi.org/10.1101/2023.04.12.536477>. *corresponding author; ¹doctoral student trainee.
23. **McPherson JG***, Bandres MF[†] (2023). Neural population dynamics reveal that motor-targeted intraspinal microstimulation preferentially depresses nociceptive transmission in spinal cord injury-related neuropathic pain. *bioRxiv* (DOI pending). Submission to *Experimental Neurology*. †student author; *corresponding author.

In preparation:

24. Twyman AR[†], Moreno-Romero GN[†], Bandres MF[†], **McPherson JG*** (2023). Leveraging the off-target effects of spinal stimulation to enhance rehabilitation from spinal cord injury. Submission to *Bioelectronic Medicine* summer 2023. †student author; *corresponding author.
25. **McPherson JG***, Bandres MF[†] (2023). Transient shifts in intraspinal functional connectivity are associated with the anti-nociceptive effects of motor-targeted spinal stimulation. *Submission* summer 2023. †student author; *corresponding author.
26. Bandres MF[†], **McPherson JG*** (2023). Spinal cord injury constrains the variability of neuronal population activity despite the emergence of sensory hyperexcitability. *Submission to J Physiol* summer 2023. †student author; *corresponding author.
27. **McPherson JG***, Bandres MF[†] (2023). Scale-free dynamics of intraspinal local field potentials, but not spontaneous oscillations, reveal structural and functional organization of spinal networks. *Submission* fall 2023. †student author; *corresponding author.
28. Moreno GR[†], Bandres MF[†], Gomes JL, **McPherson JG*** (2023). Intraspinal microstimulation of deep spinal sensory networks: a new approach for managing spinal cord injury-related sensorimotor impairments. *Submission* fall 2023. †student author; *corresponding author.

Book chapters

1. Dewald JPA, Ellis MD, Acosta AM, **McPherson JG**, Stienen AH, (2012). Implementation of impairment-based neurorehabilitation devices and technologies following brain injury. In: Dietz V, Nef T, Rymer Z (eds.) *Neurorehabilitation Technology*: Chapter 19: 343-358. Springer, 1st edition. DOI: 10.1007/978-1-4471-2277-7.
2. Dewald JPA, Ellis MD, Acosta AM, **McPherson JG**, Stienen AH (2016). Implementation of impairment-based neurorehabilitation devices and technologies following brain injury. In: Dietz V, Reinkensmeyer DJ (eds.) *Neurorehabilitation Technology*: Springer, 2nd edition. DOI: 10.1007/978-3-319-28603-7.
3. Lemay M, **McPherson JG** (2019). Spinal Interfaces: An Overview. In: Jaeger D and Jung R (eds.) *Encyclopedia of Computational Neuroscience*. ISBN: 978-1-4614-6674-1.
4. Moorjani S, **McPherson JG**, Perlmutter S (2019). Electrical Conditioning for Spike Timing-Dependent Plasticity of Neural Circuits. In: Jaeger D and Jung R (eds.) *Encyclopedia of Computational Neuroscience*. Springer. ISBN: 978-1-4614-6674-1.

Abstracts (selected)

1. **McPherson JG**, Ellis MD, Heckman CJ, Dewald JPA (2007). Bistable motoneuron behavior as indicator of increased bulbospinal monoaminergic drive following stroke. *Society for Neuroscience Annual Meeting*. San Diego, CA.
2. **McPherson JG**, Ellis MD, Heckman CJ, Dewald JPA (2008). Enhanced tonic vibration reflexes in individuals with chronic hemiparetic stroke. *Mechanisms of Plasticity and Disease in Motoneurons*. Seattle, WA.
3. **McPherson JG**, Acosta AM, Dewald JPA (2009). Stretch reflex hyperexcitability as a function of shoulder abduction loading during the onset of ballistic reaching in individuals with chronic hemiparetic stroke. *Society for Neuroscience Annual Meeting*. Chicago, IL.
4. **McPherson JG**, Stienen AH, Dewald JPA (2010). The relationship between velocity and shoulder abduction loading in post-stroke upper limb stretch reflexes. *Society for Neuroscience Annual Meeting*. San Diego, CA.
5. Alcaro M, Lucido C, Meiksins L, Surico N, **McPherson JG**, Sukal-Moulton T, Dewald JPA (2011). Tonic vibration reflexes in children with hemiplegia. *American Physical Therapy Association Combined Sections Meeting*. New Orleans, LA.
6. **McPherson JG**, Stienen AH, Drogos JM, Dewald JPA (2011). The relationship between the flexion synergy and stretch reflexes in individuals with chronic

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