Curriculum Vitae

Date: 2024.07.02
Name: Jacob Graves McPherson, PhD

Contact Information:

Address, Telephone and email:

- Office
  - 314-273-1183
  - 4444 Forest Park Ave., Campus Box 8502; St. Louis, MO 63108
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  - 919-606-8604
  - 4142 Shenandoah Ave., St. Louis, MO 63110
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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

2023 - Dept. of Neurosurgery, NIH Mock Study Section

2024 - Program in Physical Therapy, Research Faculty Search Committee

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." *EurekAlert!* (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, Science Advances, 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

National Panels, Committees, Boards:

2017 - **Reviewer pool**: National Science Foundation

2019 - **Reviewer pool**: National Institutes of Health

2019 - **Reviewer pool**: American Heart Association

2020 - **Reviewer**: NIH/NINDS BNVT study section

2022 - **Reviewer:** NIH/NINDS ICN/IFCN study sections

2022 - **Reviewer:** VA Rehabilitation Research and Development grants

2023 - **Reviewer:** NIH/NINDS ZNS1-SRB Program Grant (P01) study section

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 Why do pets like to be petted? Does the spinal cord sound like a sleep machine? Can you get better at playing the piano by taking a nap? Curiosities from a guided tour through the lumbar enlargement. *Washington University Program in Physical Therapy Seminar Series.* January 24th, 2023. St. Louis, MO.

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.

2023 Zombie cats, cyborg rats, and monkeys with computer chip hats: just another day in the clinic? *Avioli Musculoskeletal Research Seminar.* Oct. 27th, 2024. St. Louis, MO.

Research Support:

Past

Governmental

R01 NS054269 Dewald (PI) 09/01/2005 - 05/31/2010
NINDS $1,150,031
Title: *"Monoaminergic drive and discoordination following stroke."*
Role: Graduate research associate

R01 HD079076-01A1 Elliott (PI) 12/01/2014 - 05/01/2015
NICHD $1,258,840
Title: *"Neuromuscular mechanisms underlying poor recovery from whiplash injuries."*
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

1 F99 NS13581101 Bandres MF (trainee), **McPherson JG** (sponsor) 09/15/2023 - 08/31/2025
NINDS $35,424
Title: "*Integrative spinal physiology to restore neural control of sensorimotor functions after neurological injury.*"
Role: Sponsor and primary mentor for PhD student trainee

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

McPherson JG (PI) and de Lucas* (PI) 07/01/2024 – 06/30/2026
McDonnel Center for Systems Neurosciences $100,000
Title: *"Parvalbumin interneurons and retinoic acid signaling in spinal cord injury-related neuropathic pain."*
Role: Principal Investigator
*post-doctoral trainee of McPherson JG

Ray (PI) and **McPherson JG** (Co-I) 03/01/2024 – 02/28/2025
University of Missouri Spinal Cord Injury/Disease Research Program $100,000
Title: *""Electrical stimulation therapy to improve outcomes of nerve transfer surgery in tetraplegia."*
Role: Co-investigator

Trainee/Mentee/Sponsorship Record:

Senior scientists/Lab managers

2023 - Jeremie Ferey, PhD
Mentors: Jacob McPherson, PhD, and Gretchen Meyer, PhD
Discipline: Neurophysiology and muscle physiology

Post-doctoral Fellows

2017 - 2018 Behdad Tahayori, PT, PhD
Mentor: Jacob McPherson, PhD
Discipline: Neurophysiology and neurorehabilitation engineering
Current position: Assistant Professor of Physical Therapy, University of St. Augustine for Health Sciences

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: Associate Professor, University of Colorado

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 Iian 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, McMahon 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, McMahon 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 MF[1], Gomes J, Moreno-Romero GN[1], Twyman AR[1], **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; [1]doctoral 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. *Brain Communications*. DOI: https://doi.org/10.1101/2023.04.12.536477. *corresponding author; [1]doctoral student trainee.

23. Twyman AR[†], Moreno-Romero GN[†], Bandres MF[†], **McPherson JG*** (2024). Leveraging the off-target effects of spinal stimulation to enhance rehabilitation from spinal cord injury. *Bioelectronic Medicine*. [†]student author; [*]corresponding author.

24. Twyman AR[ζ], Bandres MF[ζ], **McPherson JG*** (2024). Nonlinear firing dynamics in spinal interneurons may delineate the presence or absence of spinal cord injury-

related neuropathic pain. *IEEE Xplore*, (accepted). ᵟstudent author; *corresponding author.

25. Bandres MFᵟ, **McPherson JG*** (2024). Chronic spinal cord injury increases spontaneous intraspinal neural transmission and spike train variability. *IEEE Xplore* (accepted). ᵟstudent author; *corresponding author.

26. Moreno-Romero GNᵟ, Bandres MFᵟ, **McPherson JG*** (2024). Sensory-targeted intraspinal microstimulation for spinal cord injury rehabilitation. *IEEE Xplore* (accepted). ᵟstudent author; *corresponding author.

27. de Lucas JRᵟ, Bandres MFᵟ, **McPherson JG*** (2024). Spinal noradrenergic alpha-2 receptors mediate the antinociceptive effects of therapeutic intraspinal microstimulation. *IEEE Xplore* (accepted). ᵟpost-doctoral trainee author; *corresponding author.

28. Bandres MF†, **McPherson JG*** (2024). Spinal cord injury-related neuropathic pain is associated with abnormal spontaneous transmission in spinal pain pathways. *J Physiol. (conditionally accepted; in revision)* †student author; *corresponding author.

29. **McPherson JG***, Bandres MF† (2024). Neural population dynamics reveal that motor-targeted intraspinal microstimulation preferentially depresses nociceptive transmission in spinal cord injury-related neuropathic pain. *bioRxiv* doi: https://doi.org/10.1101/2023.07.27.550880*. Pain Reports (in minor revision).* †student author; *corresponding author.

30. **McPherson JG***, Miller RR, Perlmutter SI, Fetz EE (2024). Volitional control of a recurrent brain computer interface via covert reinforcement of endogenous reward networks. *Submitted.* *corresponding author.

31. Bandres MF†, **McPherson JG*** (2024). Spinal cord injury constrains the variability of neuronal population activity despite the emergence of sensory hyperexcitability. *Manuscript written; Submission July 2024.* †student author; *corresponding author.

32. De Lucas JRᵟ, **McPherson JG*** (2024). Blockade of spinal noradrenergic alpha-2 receptors promotes non-canonical anti-nociception. *Manuscript written; Submission July 2024*. ᵟpost-doctoral trainee author; *corresponding author.

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