

# Jared M Cregg, PhD

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## Education

- 2018      **PhD, Neuroscience**  
Case Western Reserve University  
Cleveland, OH
- 2010      **BSE, Biomedical Engineering**  
Michigan Technological University  
Houghton, MI

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## Research Positions

- 2017 -      **Postdoctoral Scholar**  
Laboratory of Prof. Ole Kiehn  
Department of Neuroscience, University of Copenhagen  
Copenhagen, Denmark
- 2010 - 2017      **Graduate Student**  
Laboratories of Drs. Jerry Silver & Lynn T Landmesser  
Department of Neuroscience, Case Western Reserve University  
Cleveland, OH
- 2009 - 2010      **Research Assistant**  
Laboratory of Dr. John W McDonald, III  
Department of Neurology, Johns Hopkins University  
Baltimore, MD
- 2007 - 2009      **Research Assistant**  
Laboratory of Asst. Prof. Ryan J Gilbert  
Department of Biomedical Engineering, Michigan Technological University  
Houghton, MI

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## Publications

### Postdoc

- Cregg JM**, Sidhu SK, Leiras R, Kiehn O. (2023) Basal ganglia-spinal cord pathway that commands locomotor gait asymmetries. *Invited revision, Nature Neuroscience* ([pdf](#))
1. **Cregg JM**<sup>†</sup>, Mirdamadi JL, Fortunato C, Okorokova EV, Kuper C, Nayeem R, Byun AJ, Avraham C, Buonocore A, Winner TS, Mildren RL. (2023) Highlights from the 31<sup>st</sup> Annual Meeting of the Society for the Neural Control of Movement. *Journal of Neurophysiology* 129:220-234. <sup>†</sup>Corresponding author. ([pdf](#))
  2. Leiras R\*, **Cregg JM**\*, Kiehn O. (2022) Brainstem circuits for locomotion. *Annual Review of Neuroscience* 45:63-85. \*Co-first authors. ([pdf](#))
  3. **Cregg JM**, Leiras R, Montalant A, Wanken P, Wickersham IR, Kiehn O. (2020) Brainstem neurons that command mammalian locomotor asymmetries. *Nature Neuroscience* 23:730-740. ([pdf](#))

### Graduate

4. Vagnozzi AN, Garg K, Dewitz C, Moore MT, **Cregg JM**, Jeannotte L, Zampieri N, Landmesser LT, Philippidou P. (2020) Phrenic-specific transcriptional programs shape respiratory motor output. *eLife* 9:e52859. ([pdf](#))

5. Lager AM, Corradin O, **Cregg JM**, Elitt MS, Shick E, Clayton BL, Allan KC, Olsen HE, Madhavan M, Tesar PJ. (2018) Rapid functional genetics of the oligodendrocyte lineage using pluripotent stem cells. *Nature Communications* 9:3708. ([pdf](#))
6. **Cregg JM**, Chu KA, Dick TE, Landmesser LT<sup>†</sup>, Silver J<sup>†</sup>. (2017) Phasic inhibition as a mechanism for generation of rapid respiratory rhythms. *Proceedings of the National Academy of Sciences USA* 114:12815-12820. <sup>†</sup>Co-corresponding authors. ([pdf](#))
7. **Cregg JM**, Chu KA, Hager LE, Maggard RS, Stoltz DR, Edmond M, Alilain WJ, Philippidou P, Landmesser LT, Silver J. (2017) A latent propriospinal network can restore diaphragm function after high cervical spinal cord injury. *Cell Reports* 21:654-665. ([pdf](#))
8. Niemi JP, DeFrancesco-Lisowitz A, **Cregg JM**, Howarth M, Zigmond RE. (2015) Overexpression of the monocyte chemokine CCL2 in dorsal root ganglion neurons causes a conditioning-like increase in neurite outgrowth and does so via a STAT3 dependent mechanism. *Experimental Neurology* 275:25-37. ([pdf](#))
9. Gardner RT, Wang L, Lang BT, **Cregg JM**, Dunbar CL, Woodward WR, Silver J, Ripplinger CM, Habecker BA. (2015) Targeting protein tyrosine phosphatase sigma after myocardial infarction restores cardiac sympathetic innervation and prevents arrhythmias. *Nature Communications* 6:6235. ([pdf](#))
10. Lang BT, **Cregg JM**, DePaul MA, Tran AP, Xu K, Dyck SM, Madalena KM, Brown BP, Weng YL, Li S, Karimi-Abdolrezaee S, Busch SA, Shen Y, Silver J. (2015) Modulation of the proteoglycan receptor PTP $\sigma$  promotes recovery after spinal cord injury. *Nature* 518:404-408. ([pdf](#))
11. **Cregg JM**, DePaul MA, Filous AR, Lang BT, Tran A, Silver J. (2014) Functional regeneration beyond the glial scar. *Experimental Neurology* 253:197-207. ([pdf](#))
12. Hilton BJ, Lang BT, **Cregg JM**. (2012) Keratan sulfate proteoglycans in plasticity and recovery after spinal cord injury. *Journal of Neuroscience* 32:4331-4333. ([pdf](#))

#### Undergraduate

13. Hurtado A\*, **Cregg JM\***, Wang HB, Wendell DF, Oudega M, Gilbert RJ, McDonald JW. (2011) Robust CNS regeneration after complete spinal cord transection using aligned poly-L-lactic acid microfibers. *Biomaterials* 32:6068-6079. \*Co-first authors. ([pdf](#))
14. Wang HB, Mullins ME, **Cregg JM**, McCarthy CM, Gilbert RJ. (2010) Varying the diameter of aligned electrospun fibers alters neurite outgrowth and Schwann cell migration. *Acta Biomaterialia* 6:2970-2978. ([pdf](#))
15. **Cregg JM**, Wiseman SL, Pietrzak-Goetze NM, Smith MR, Jaroch DB, Clupper DL, Gilbert RJ. (2010) A rapid, quantitative method for assessing axonal extension on biomaterial platforms. *Tissue Engineering Part C: Methods* 16:167-172. ([pdf](#))
16. Wang HB, Mullins ME, **Cregg JM**, Hurtado A, Oudega M, Trombley MT, Gilbert RJ. (2009) Creation of highly aligned electrospun poly-L-lactic acid fiber for nerve regeneration applications. *Journal of Neural Engineering* 6:016001. ([pdf](#))

#### Bibliometric Summary

Web of Science: >1700 citations, h-index 12 ([link](#))

Google Scholar: >2600 citations, h-index 15 ([link](#))

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#### Funding

2021 - 2024	Postdoctoral Fellowship Lundbeck Foundation \$380,000 USD
2018 - 2020	EMBO Long-Term Fellowship European Molecular Biology Organization (EMBO) \$120,000 USD

- 2016 - 2017    Core Pilot Grant  
CTSC Case Western Reserve University  
\$7,100
- 2010 - 2013    Graduate Research Fellowship  
National Science Foundation (NSF)  
\$123,500 USD

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### Invited/Conference Talks

- 2024\*    European Molecular Biology Laboratory: DANEMO Symposium (*\*planned*)  
*Copenhagen, Denmark*
- 2023    Benzon Symposium: Bringing Circuit for Movement Together  
*Copenhagen, Denmark*
- 2023    Department of Neuroscience, University of Minnesota  
*Minneapolis, MN*
- 2023    Motor Control: Spinal Circuits and Beyond  
*St Andrews, Scotland*
- 2023    XIV Meeting of the International Basal Ganglia Society  
*Stockholm, Sweden*
- 2023    Department of Neuroscience, Karolinska Institutet  
*Stockholm, Sweden*
- 2023    School of Psychology and Neuroscience, University of St Andrews  
*St Andrews, Scotland*
- 2023    Department of Neurobiology and Behavior, Stony Brook University  
*Stony Brook, NY*
- 2023    Department of Neuroscience, Yale University  
*New Haven, CT*
- 2022    Department of Neuroscience, Case Western Reserve University  
*Cleveland, OH*
- 2022    Annual Meeting of the Society for the Neural Control of Movement  
*Dublin, Ireland*
- 2022    Basal Ganglia Gordon Research Seminar  
*Ventura, CA*
- 2021    Brain States Meeting, Danish Society for Neuroscience  
*Copenhagen, Denmark*
- 2020    Emerging Neuroscientists Seminar Series, Sainsbury Wellcome Center  
*London, UK*
- 2020    International Online Spinal Cord Injury Research Seminars  
*Virtual seminar*
- 2019    Workshop on Neuronal Circuits in Motor Behavior, Okinawa Institute of Science & Technology  
*Okinawa, Japan*
- 2016    National Neurotrauma Society Annual Meeting  
*Lexington, KY*
- 2015    Department of Pulmonary, Critical Care, and Sleep Medicine, Case Western Reserve University  
*Cleveland, OH*
- 2010    Society for Biomaterials Annual Meeting  
*Seattle, WA*

2008 Biomedical Engineering Society Annual Meeting  
St. Louis, MO

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### Awards

2022 Scholarship Award, Society for the Neural Control of Movement  
2021 Trainee Professional Development Award, Society for Neuroscience  
2018 Best Poster Award, The Brain Prize Meeting, Middlefart, Denmark  
2018 Doctoral Excellence Award in Neurosciences, Case Western Reserve University  
2015 Travel Award, International Symposium on Neural Regeneration  
2008 Summer Undergraduate Research Fellowship, NASA / Michigan Space Grant Consortium  
2008 Summer Undergraduate Research Fellowship, Michigan Technological University  
2008 Barry M. Goldwater Scholarship  
2008 Grand Prize Winner, Graduate Research Forum Poster Competition, Michigan Technological University

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### Mentoring

2020 - 2022 Simrandeep K Sidhu  
MS Thesis in Neuroscience, University of Copenhagen  
*Current PhD student in Neuroscience Academy Denmark*  
2018 - 2020 Paulina Wanken  
MS Thesis in Human Biology, University of Copenhagen  
*Current PhD student at Max Planck Institute*  
2015 - 2017 Kevin A Chu  
BS Thesis in Biology, Case Western Reserve University  
*Medical Graduate of NYIT College of Osteopathic Medicine*

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### Teaching

#### *University of Copenhagen*

2023 PhD Course: Open Neurophysiology – Analysis Tools & Datasets  
Lecture: 'Tracking Locomotor Asymmetries using DeepLabCut' ([link](#))  
Department of Neuroscience  
2022 PhD Course: Animal Models of Disease and Behavior  
Lecture: 'In Vivo Calcium Recording' ([slides](#))  
Department of Neuroscience  
2021 Workshop on Animal Models  
Lecture: 'Measuring Mouse Behavior: Dissection of Circuits for Motor Control'  
Graduate Program in In Vivo Pharmacology  
2018 - 2022 MS Course: Neuronal Signaling/Neuroscience  
Lecture: 'In Vivo Optogenetics & Chemogenetics' ([slides](#))  
Department of Neuroscience

#### *Case Western Reserve University*

2017 PHOL519: Cardiorespiratory Physiology  
Cardiovascular Control in Disease: Cardiac Arrhythmia ([syllabus](#)) ([slides](#))  
Department of Physiology & Biophysics

## Patents

1. Hurtado A, Gilbert RJ, Wang HB, **Cregg JM**, Mullins ME, Oudega M. Three-dimensional scaffolds, methods for fabricating the same, and methods of treating a peripheral nerve or spinal cord injury. US Patent 10,413,391.
  2. Silver J, Lang BT, **Cregg JM**, Weng YL, Li H, Wu W. Compositions and methods of treating root avulsion injury. US Patent 10,258,672.
  3. Lang BT, **Cregg JM**, Weng YL, Silver J. Compositions and methods for inhibiting the activity of lar family phosphatases. US Patent 9,937,242.
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## Conference Abstracts

- 2022 Cregg JM, Sidhu SK, Leiras R, Kiehn O. Basal ganglia-spinal cord pathway that commands locomotor gait asymmetries. Society for Neuroscience Annual Meeting  
*San Diego, CA*
- 2022 Cregg JM, Sidhu SK, Leiras R, Kiehn O. Basal ganglia-spinal cord pathway that commands locomotor asymmetries. Federation of European Neuroscience Societies Forum  
*Paris, France*
- 2022 Cregg JM, Leiras R, Kiehn O. Basal ganglia-spinal cord pathway that commands locomotor asymmetries. Basal Ganglia Gordon Research Conference  
*Ventura, CA*
- 2021 Cregg JM, Leiras R, Kiehn O. Basal ganglia-spinal cord pathway that mediates locomotor asymmetries. Society for Neuroscience Annual Meeting  
*Virtual meeting*
- 2019 Cregg JM, Leiras R, Kiehn O. Brainstem command neurons that specify locomotor direction. Society for Neuroscience Annual Meeting  
*Chicago, IL*
- 2018 Cregg JM, Leiras R, Kiehn O. Spinal projection neurons that control direction orientation during mammalian locomotion. The Brain Prize Meeting  
*Middelfart, Denmark*
- 2016 Cregg JM, Chu K, Dick T, Landmesser LT, Silver J. Optogenetic dissection reveals principles underlying respiratory frequency control. Society for Neuroscience Annual Meeting  
*San Diego, CA*
- 2016 Cregg JM, Chu K, Dick T, Landmesser LT, Silver J. Optogenetic dissection reveals principles underlying respiratory frequency control. Cell Symposium: Big Questions in Neuroscience  
*San Diego, CA*
- 2015 Cregg JM, Landmesser LT, Silver J. Control of diaphragm activity in the absence of supraspinal input: the contribution of interneurons. International Symposium on Neural Regeneration  
*Pacific Grove, CA*
- 2015 Cregg JM, Landmesser LT, Silver J. Control of diaphragm activity in the absence of supraspinal input: the contribution of interneurons. Society for Neuroscience Annual Meeting  
*Chicago, IL*
- 2009 Cregg JM, Wang HB, Gilbert RJ. The role of fiber density in axon motility on aligned topography. Biomedical Engineering Society Annual Meeting  
*Pittsburgh, PA*

- 2009 Cregg JM, Wang HB, Gilbert RJ. The role of aligned fiber density in axon motility. Midwest Biomedical Engineering Conference  
*Ann Arbor, MI*
- 2008 Cregg JM, Wang HB, Mullins ME, Gilbert RJ. Development of polymeric nerve guidance conduits that contain anisotropic cues including aligned microfibers and gradients of adsorbed laminin-1. Design of Medical Devices Conference  
*Minneapolis, MN*
- 2007 Cregg JM, Wang HB, Trombley MT, Gilbert RJ. Anisotropic micro-fibrous scaffolds for nerve regeneration applications. Biomedical Engineering Society Annual Meeting  
*Los Angeles, CA*

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### Short Courses/Workshops (Attendee)

- 2022 EMBO Course on Laboratory Leadership  
*Virtual course*
- 2020 EMBO Course on Negotiation for Scientists  
*Heidelberg, Germany*
- 2016 Brain Function: Development, Aging and Disease  
*Lexington, KY*
- 2010 Practical Training Course in Confocal Microscopy and Stereology  
*Chicago, IL*
- 2009 Tissue Engineering of the Nervous System  
*Pittsburgh, PA*
- 2008 Peripheral Nerve Regeneration, Georgia Institute of Technology  
*Atlanta, GA*

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### Service

#### *Committees*

Nominations Committee - Student Invited Speaker, Department of Neuroscience, Case Western Reserve University (2015).

#### *Peer Review*

Ad hoc reviewer for *Scientific Reports*, *Experimental Neurology*

Co-reviewer with Prof. Ole Kiehn for *Cell*, *Neuron*, *Nature Communications*, *Frontiers in Neuroscience*

Co-reviewer with Dr. Jerry Silver for *Nature Neuroscience*

#### *Society Membership*

Society for Neuroscience (2015 - present)

American Association for the Advancement of Science (2010 - present)