

**Jaclyn T. Eisdorfer, Ph.D.**  
Post-Doctoral Fellow

Rutgers University  
School of Arts and Sciences  
Dept. of Cell Biology and Neuroscience  
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**EDUCATION:**

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|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Ph.D.</b> | Temple University<br>Department of Bioengineering<br><i>Dissertation:</i> "Using chemogenetics and novel tools to uncover neural circuit and behavioral changes after spinal cord injury"<br><i>Advisors:</i> Drs. Andrew J. Spence (PI), Michel A. Lemay, George M. Smith, and Tonia Hsieh | May 2021  |
| <b>M.S.</b>  | Temple University<br>Department of Bioengineering<br><i>Thesis:</i> "CNO alone does not affect the H-reflex in naïve rats: implications for studies that use DREADDs"<br><i>Thesis Advisor:</i> Dr. Andrew J. Spence (PI)                                                                   | May 2019  |
| <b>B.A.</b>  | University of California, Santa Barbara<br>College of Creative Studies<br>Biology (with emphasis in Engineering)                                                                                                                                                                            | June 2017 |

**RESEARCH INTERESTS:**

- My interests lie at the crux of anatomy and function. Specifically, *how do sensorimotor circuits that are important in locomotion and naturalistic motor movements shape behavior and influence functional recovery following SCI?*
- Build testable models of sensorimotor circuits involved in functional recovery, including their anatomical response to therapeutic interventions and the mechanisms by which they shape beneficial behavioral outcomes.
- Silo phases of SCI recovery. In doing so, I can identify specific behavioral biomarkers which open and close these phases, thereby uncovering therapeutic targets for rehabilitation optimization.
- Streamline our understanding of the motor units and muscle recruitment that underlies emitted behavior following SCI and use this to develop new motor control theories behind functional recovery.

**RESEARCH EXPERIENCE:**

|                                                                                                                              |                          |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Post-doctoral Fellow</b>                                                                                                  | September 2021 – Present |
| Rutgers University, Dept. of Cell Biology and Neuroscience, W. M. Keck Center for Collaborative Neuroscience, Piscataway, NJ |                          |

**Advisor: Dr. Victoria E. Abraira**

- Recipient of the NIH NINDS F32 (2023-present) and T32 (2021-2023) fellowships
- Using motion sequencing, computer vision, and unsupervised machine learning to identify and analyze deficits after spinal cord injury (SCI)
- Creating genetic mouse lines to understand how proprioceptive and cutaneous sensory input contributes to recovery from SCI
- Teasing apart the interneuronal populations that are involved in sensorimotor integration and whose activity promotes enhanced recovery after SCI
- Generating new methodologies for understanding phases of recovery after SCI
- Building multi-camera rig with multi-computer interface that supports 3D mouse rendering and gait analysis and is capable of being coupled to a multitude of sensorimotor assays
- Mentoring undergraduate and graduate students and fellows
- Founder of the Abraira Lab Computational Internship with >125 Interns to date
- Intellectual and writing contributor to multiple grants
- Collaborating with labmates on their projects

**Graduate Research Assistant**

September 2017 – May 2021

Temple University, Dept. of Bioengineering, Philadelphia, PA

**Advisor: Dr. Andrew J. Spence**

- Recipient of the First Summers Research Initiative Fellowship (2018), Gordon Conference Graduate Attendee Award (2019), Academic Scholarship Award (2021), and Dissertation Completion Grant Award (2021)
- Designed and fabricated a novel modification to a sensorimotor assay to probe for subtle locomotor changes in rodent (rat) biomechanics
- Constructed an apparatus for use in perfusion and harvesting of tissue
- Performed invasive rodent survival electrophysiology and neurosurgeries
- Quantified and analyzed rodent hindlimb kinematics after spinal cord injury
- Mentored undergraduate interns and Masters Degree candidates
- Intellectual and writing contributor to multiple grants
- Graduate Research Fellow for Shriners Hospitals for Children Grant #85115, Neilsen Foundation Senior Research Grant #546798, and NIH NINDS R01 Grant #1R01NS114007-01A1

**Undergraduate Research Intern**

June 2015 – June 2017

University of California, Santa Barbara, Dept. of Electrical and Chemical Engineering, Santa Barbara, CA

**Advisor: Dr. Luke Theogarajan****Project:** "Designing and constructing a bioluminescent reporter using bacterial luciferase for voltage imaging in freely moving animals"

- Designed and constructed, AMBER, a mutated luciferase for stimulation of neurodegenerative neurons
- Performed PCR, bacterial mutagenesis, and cell transfection for validation of AMBER
- Undergraduate contributing author on manuscript (Srinivasan P, ...**Eisdorfer JT**, et al., 2021)

**Undergraduate Research Intern**

September 2014 – June 2015

University of California, Santa Barbara, Dept. of Materials Science, Santa Barbara, CA

**Advisor: Dr. Omar A. Saleh****Project:** "Creating DNA structures and using a customized Magnetic Tweezer to measure force-extension curves of structures"

- Created DNA structures to understand DNA tensile strength

- Produced force-extension curves with a Magnetic Tweezer on a nanometer scale

## TEACHING EXPERIENCE:

### Dissertation Committee Member Fall 2023 – Present

*Graduate student:* Alana M. Martinez (PhD student)

Dept. of Cell Biology and Neuroscience, Rutgers University

- Serving as one of 4 members of Ms. Martinez's Dissertation Committee as a postdoc.
- Assisting Ms. Martinez with crafting dissertation plan, including crafting specific aims and methodology.
- Providing guidance and constructive feedback to Ms. Martinez in weekly meetings.
- Providing subject-level expertise to Ms. Martinez, including spinal cord injury, computation, biomechanics, and machining.
- Providing Ms. Martinez with ethical oversight to ensure her research adheres to the highest ethical standards as instituted by Rutgers University and the NIH.
- Ensuring that Ms. Martinez's research meets the requirements for a PhD Dissertation, including meaningfully impacting the current state of the literature.
- Facilitating collaborations between Ms. Martinez and my colleagues within our field.
- Editing Ms. Martinez's manuscripts and presentations to help to ensure success.
- Will attend and participate in all meetings and presentations related to Ms. Martinez's research, such as her Proposal and Dissertation Defenses.

### Primary Instructor Fall 2020

*Course:* Ethics in Biomedical Sciences

Dept. of Bioengineering, Temple University

- Planned assignments and led debates on discussion of current biomedical ethical issues
- Presented current biomedical techniques to engage undergraduate students
- Implemented group-learning strategies to encourage sharing of ideas in the classroom
- Created community-based virtual learning during a pandemic

### Teaching Assistant Fall 2017 – Spring 2018

*Course:* Ethics in Biomedical Sciences

Dept. of Bioengineering, Temple University

- Led multiple lectures and all class discussions
- Graded assignments and tests for >100 undergraduate students
- Interacted with students during weekly office hours

## FELLOWSHIPS, HONORS, AND AWARDS:

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|---------------------------------------------------------------------------------|----------------|
| K99/R00 NIH NINDS Award                                                         | 2025 – Present |
| Rutgers University Presidential Postdoctoral Fellowship                         | 2023 – 2025    |
| 2 <sup>nd</sup> Place Poster Winner, Brain Health Institute, Rutgers University | 2023           |
| F32 NIH NINDS Fellowship                                                        | 2023 – 2025    |
| Discussion Leader, Gordon Conference Seminar                                    | 2022 – 2023    |
| T32 NIH NINDS Fellowship                                                        | 2021 – 2023    |
| Dissertation Completion Grant, Temple University                                | 2021           |
| Academic Scholarship Award, Temple University                                   | 2020           |
| Graduate Attendee Award, Gordon Conference                                      | 2019           |

### PROFESSIONAL AFFILIATIONS:

|                                                  |                |
|--------------------------------------------------|----------------|
| Delta Gamma (ΓΔ) Fraternity, Gamma Kappa chapter | 2014 – Present |
| Chinese National Honors Society                  | 2010-2013      |
| National Honors Society                          | 2009-2013      |

### PROFESSIONAL SERVICE:

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|---------------------------------------------------------|----------------|
| <b>Brain Health Institute (BHI), Rutgers University</b> | 2024 – Present |
|---------------------------------------------------------|----------------|

*Role:* Chair of Postdoctoral Alliance Working Group, Executive committee member

- Strategically plan for the benefit of postdocs and trainees within the BHI
- Disseminate important information to trainees
- Facilitate collaborations within/between Rutgers campuses and with the Princeton Neuroscience Institute
- Plan workshops and events for trainees

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|--------------------------------------------------|-------------|
| <b>Rutgers University Keck Center Open House</b> | 2022 – 2023 |
|--------------------------------------------------|-------------|

*Role:* Co-Chair

- Organized Open House program
- Conceptualized and actualized learning games for incoming students
- Organized budget
- Facilitated conversations between Keck Center faculty, SCI community members, and incoming students
- Mentored volunteer undergraduate students

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|-----------------------------------------------------------------|----------------|
| <b>Kessler Institute for Rehabilitation, Kessler Foundation</b> | 2021 – Present |
|-----------------------------------------------------------------|----------------|

*Role:* Clinical Observer, Postdoctoral Rotation Fellow

- Mentor: Steven Kirshblum, MD (Chief Medical Officer)
- Learn the symptoms of, treatment of, and rehabilitation for patients suffering from SCI
- Interact with human SCI patients
- Assist inpatient physicians during Spasticity Rounds, where spasticity and movement is measured
- Assist outpatient physicians during chronic SCI evaluations, Botulinum Toxin injections (spasticity treatment), and baclofen pump refills
- Discuss clinically translatable scientific questions for my preclinical research with Dr. Kirshblum

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|--------------------------------------------------------------------------|-------------|
| <b>Gordon Research Seminar: Central Nervous System Injury and Repair</b> | 2019 – 2022 |
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*Role:* Co-Chair

- Co-PI of NIH NINDS R13 Grant (**awarded**)
- Organized conference program and selected abstracts for poster and oral presentations
- Chaired “Power Hour”, a conference session devoted to empowering women in science
- Appointed contact for funding agencies for conference support
- Mentored graduate students and post-doctoral fellows

### Manuscript Reviewer

STAR Protocols

### Volunteer Contributor

**Sci-Trek Volunteer**

- Organized and conducted scientific experiments for and with underprivileged youth to facilitate student engagement in STEM

**Service for Sight Volunteer**

- Organized and participated in Service for Sight philanthropies

**PUBLICATIONS: Refereed Journal Articles**

**Eisdorfer JT**, Nacht HD, Kowalski T, Thackray JT, Martinez AM, Zymoro L, Phu MV, Hirpara RR, Danish BS, Wang R, Khondker A, Eisdorfer AB, Tischfield M, Abaira VE. (2024) Treadmill step training promotes corticospinal tract plasticity after incomplete spinal cord injury. *BioRxiv*. <https://doi.org/10.1101/2024.10.14.618099>

- Underlined authors are my undergraduate and graduate mentees (also below).

**Eisdorfer JT\***, Lin S\*, Thackray J\*, Theis T, Ricci M, Vivinetto A, Tschang M, Mahmood M, Oputa O, Martinez A, Nacht HD, Zymoro L, Pusuloori S, Ruven C, Machildon A, Sahni V, Tucker A, Birch D, Bernstein A, Hollis E, Dulin J, Tysseling VM, Popovich P, McTigue D, Datta SR, Abaira VE (2024). Revealing motor behavior patterns and functional improvement trajectories following spinal cord injury using unsupervised machine learning. *BioRxiv*. <https://doi.org/10.1101/2023.10.31.564826> (*Submitted to Nature Neuroscience*).

- Asterisks designate co-first authors (also below).

Gradwell MA\*, Ozeri-Engelhard N\*, **Eisdorfer JT**, Laflamme OD, Gonzalez M, Upadhyay A, Medlock L, Shrier T, Patel KR, Aoki A, Gandhi M, Abbas-Zadeh G, Oputa O, Thackray JK, Ricci M, George A, Yusuf N, Keating J, Imtiaz Z, Alomary SA, Bohic M, Haas M, Hernandez Y, Prescott SA, Akay T, Abaira VE. Multimodal sensory control of motor performance by glycinergic interneurons of the mouse spinal cord deep dorsal horn. *Neuron*. 2024 Apr 17;112(8):1302-1327.e13. doi: 10.1016/j.neuron.2024.01.027. Epub 2024 Mar 6. PMID: 38452762.

Bohic M\*, Upadhyay A\*, **Eisdorfer JT**, Keating J, Simon RC, Briones BA, Azadegan C, Nacht HD, Oputa O, Martinez AM, Bethell BN, Gradwell MA, Romanienko P, Ramer MS, Stuber GD, Abaira VE (2023). A new Hoxb8FlpO mouse line for intersectional approaches to dissect developmentally defined adult sensorimotor circuits. *Frontiers in Molecular Neuroscience*. Vol 16. <https://doi.org/10.3389/fnmol.2023.1176823>

**Eisdorfer JT**, Sobotka-Briner H, Schramfield S, Moukarzel G, Chen J, Champion TJ, Smit R, Rauscher BC, Lemay MA, Smith GM, Spence AJ. Chemogenetic modulation of sensory afferents induces locomotor changes and plasticity after spinal cord injury. *Frontiers in Molecular Neuroscience*. 2022 Aug 26;15:872634. doi: 10.3389/fnmol.2022.872634. PMID: 36090254; PMCID: PMC9461563.

**Eisdorfer JT\*** and Phelan MA\*, Keefe KM, Rollins MM, Champion TJ, Rauscher KM, Sobotka-Briner H, Senior M, Gordon G, Smith GM, Spence AJ (2021). Addition of angled rungs to the horizontal ladder walking task for more sensitive probing of sensorimotor changes. *PLoS ONE*. 16:2. doi: 10.1371/journal.pone.0246298

Srinivasan P, Griffin NM, Thakur D, Joshi P, Nguyen-Le A, McCotter S, Jain A, Saeidi M, Kulkarni P, **Eisdorfer JT**, Rothman JH, Montell C, Theogarajan L. An Autonomous Molecular Bioluminescent Reporter (AMBER) for Voltage Imaging in Freely Moving

Animals. *Adv Biol (Weinh)*. 2021 Dec;5(12):e2100842. doi: 10.1002/adbi.202100842. Epub 2021 Nov 10. PMID: 34761564.

**Eisdorfer JT**, Smit RD, Keefe KM, Lemay MA, Smith GM, Spence AJ (2020). Epidural Electrical Stimulation: a review of plasticity mechanisms that are hypothesized to underly enhanced recovery from spinal cord injury with stimulation. *Frontiers in Molecular Neuroscience*. 13:163. doi: 10.3389/fnmol.2020.00163.

#### **OTHER PUBLICATIONS: Manuscripts in Progress**

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**Eisdorfer JT**, Keefe KM, Smith GM, Lemay MA, Spence AJ (*in preparation*). CNO alone does not affect the H-reflex in naïve rats: implications for studies that use DREADDs. (*To be submitted to Journal of Neurophysiology Rapid Reports*).

#### **GRANT WRITING:**

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**NIH NINDS RM1 COMBINE Grant (2023, in preparation)**: The Spinal Cord Injury Virtual Collective (SCViC): Integrating Multidisciplinary Advances and AI Technologies for a Unified Preclinical Framework for Pre-Clinical Spinal Cord Injury Research and Treatment  
*Role*: Key Personnel

**NIH NINDS T32 Fellowship (2023, awarded)**: Ms. Alana M. Martinez's Biotechnology Training Program Fellow Application.  
*Role*: Mentor

**NIH NINDS Diversity Supplement Fellowship (2023, awarded)**: Ms. Hannah D. Nacht's Diversity Supplement grant.  
*Role*: Mentor

**NIH NINDS F32 Fellowship (2023, awarded)**: Bringing the clinic to the lab: the effects of forced and non-forced rehabilitation on functional recovery after spinal cord injury.  
*Role*: Fellow

**NIH NINDS Diversity Supplement Fellowship (2021, awarded)**: Touching on locomotion: Mr. Olisemeka Oputa Diversity Supplement.  
*Role*: Mentor

**Collaborative grant with the Engineering Department at Rutgers University (2021, awarded)**  
*Role*: Key Personnel

**NIH NINDS R13 (2021, awarded)**: 2021 Gordon Research Conference and Seminar on Central Nervous System Injury and Repair  
*Role*: Co-PI

**NIH NINDS R01 (2019, awarded)**: "Chemogenetic afferent modulation to understand spinal cord circuit function and plasticity post injury."  
*Role*: Graduate Research Assistant

**DoD Spinal Cord Injury Research Program (2018)**: "Chemogenetic afferent stimulation to enhance recovery from spinal cord injury."  
*Role*: Graduate Research Assistant

**ABSTRACTS:*****Oral Presentations:***

**Eisdorfer JT.** Behavioral Biomarker Scale: leveraging fractionated behavior to understand recovery from spinal cord injury. Invited Speaker. Biomedical Postdoc Professional Development Presentation, Rutgers University, Piscataway, NJ. June, 2023.

**Eisdorfer JT.** Behavioral Biomarker Scale: leveraging fractionated behavior to understand recovery from spinal cord injury. Invited Speaker. University of Cologne, Cologne, Germany. December, 2022.

**Eisdorfer JT.** Behavioral Biomarker Scale: leveraging fractionated behavior to understand recovery from spinal cord injury. Invited Speaker. Division of Life Sciences Postdoctoral Symposium, Rutgers University, Piscataway, NJ. June, 2022.

**Eisdorfer JT.** A machine-vision approach for automated locomotor recovery evaluation at millisecond timescales. Invited Speaker. University of California, San Francisco, San Francisco, CA. October 2021.

**Eisdorfer JT.** Using chemogenetics and novel tools to uncover neural circuit and behavioral changes after spinal cord injury. Selected Speaker. University of Pennsylvania and Mahony Institute for Neurosciences (MINS) Year of Neuromodulation Symposium, Philadelphia, PA. September 2021.

**Eisdorfer JT.** Clozapine-N-oxide (CNO) effect on H-reflex of naive female Sprague Dawley rats. Selected Speaker. Shriners Annual Symposium on Neural Repair, Philly, PA. June 2019.

***Poster Presentations:***

**Eisdorfer JT,** Thackray JK, Theis T, Ricci M, Tschang M, Mahmood M, Oputa O, Nacht HD, Martinez A, Zymoro L, Pusuloori S, Vivinetto A, Ruven C, Sahni V, Tucker A, Birch D, Bernstein A, Hollis E, Dulin J, Tysseling VM, Abaira VE. The Behavior Biomarker Scale (BBS): A machine-vision approach for automated locomotor recovery evaluation at millisecond timescales. Poster Presentation. Gordon Research Conference on Central Nervous System Injury and Repair, Lucca, Italy. July, 2023.

**Eisdorfer JT,** Thackray JK, Theis T, Ricci M, Tschang M, Mahmood M, Oputa O, Nacht HD, Martinez A, Zymoro L, Pusuloori S, Vivinetto A, Ruven C, Sahni V, Tucker A, Birch D, Bernstein A, Hollis E, Dulin J, Tysseling VM, Abaira VE. The Behavior Biomarker Scale (BBS): A machine-vision approach for automated locomotor recovery evaluation at millisecond timescales. Poster Presentation. Gordon Research Seminar on Central Nervous System Injury and Repair, Lucca, Italy. July, 2023.

**Eisdorfer JT,** Sobotka-Briner H, Schramfield S, Moukarzel G, Chen J, Campion TJ, Smit R, Rauscher BC, Lemay MA, Smith GM, Spence AJ. Chemogenetic modulation of sensory afferents induces locomotor changes and plasticity after spinal cord injury. Poster Presentation. Gordon Research Conference on Central Nervous System Injury and Repair, Oxnard, CA. March, 2022.

**Eisdorfer JT,** Keefe KM, Campion T. Rauscher KM, Smith GM, Lemay MA, Spence AJ. Clozapine-N-oxide (CNO) effect and preliminary evaluation of excitatory DREADDs on H-reflex of Sprague Dawley rats. Poster Presentation. Society for Neuroscience, Chicago, IL. October 2019.

**Eisdorfer JT**, Phelan MA, Keefe KM, Rollins MM, Campion TJ, Rauscher KM, Sobotka-Briner H, Senior M, Gordon G, Smith GM, Spence AJ. DREADDs modulation of afferent excitability effects asymmetrical ladder walking task. Invited Poster Presentation. International Spinal Research Trust, London, UK. September 2019.

**Eisdorfer JT**, Keefe KM, Campion T. Rauscher KM, Smith GM, Lemay MA, Spence AJ. Clozapine-N-oxide (CNO) effect on H-reflex of naive female Sprague Dawley rats. Poster Presentation. Shriners Annual Symposium on Neural Repair, Philly, PA. June 2019.

**Eisdorfer JT**, Keefe KM, Campion T. Rauscher KM, Smith GM, Lemay MA, Spence AJ. Clozapine-N-oxide (CNO) effect on H-reflex of naive female Sprague Dawley rats. Poster Presentation. Gordon Research Conference on Central Nervous System Injury and Repair, Newry, ME. May, 2019.

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**INVENTION DISCLOSURE:**

**Eisdorfer JT**, Spence AJ, Smith GM, Research Perfusion Rig, Temple University, C2020-062

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**REFEREES IN THIS APPLICATION (additional referees can be provided upon request):****Gary Aston-Jones, PhD**

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