

Stanford



J. Bradley Zuchero

Assistant Professor of Neurosurgery

 Curriculum Vitae available Online

Bio

CURRENT ROLE AT STANFORD

Assistant Professor of Neurosurgery

Covert-Matera Families Endowed Faculty Scholar

ACADEMIC APPOINTMENTS

- Assistant Professor, Neurosurgery
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Faculty Fellow, Sarafan ChEM-H
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Covert-Matera Families Endowed Faculty Scholar Award, Stanford Maternal & Child Health Research Institute (2023)
- Koret Early Career Award, Stanford University (2020)
- Beckman Young Investigator Award, The Arnold and Mabel Beckman Foundation (2019-2023)
- Harry Weaver Neuroscience Scholar Award, National Multiple Sclerosis Society (2018-2023)
- McKnight Scholar Award, The McKnight Endowment Fund for Neuroscience (2018-2021)
- Research Grant, The Shurl and Kay Curci Foundation (2018-2020)
- Career Transition Award, National Multiple Sclerosis Society (2014-2019)
- Discovery Research Award, Myelin Repair Foundation (2014)
- Pioneer Award, Myelin Repair Foundation (2012)
- Postdoctoral Fellowship, Life Sciences Research Foundation (2011-2014)
- Postdoctoral Fellowship, National Multiple Sclerosis Society (2011)
- Robert Day Allen Fellowship, Marine Biological Laboratory, Woods Hole (2009)

PROFESSIONAL EDUCATION

- Postdoctoral, Stanford University , Glial-neuron interactions (2016)
- PhD, UCSF , Biochemistry & Cell Biology (2009)
- BA, Vassar College , Biology (2002)

LINKS

- Zuchero lab: <http://zuchero.stanford.edu/>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Glia are a frontier of neuroscience, and overwhelming evidence from the last decade shows that they are essential regulators of all aspects of the nervous system. The Zuchero Lab aims to uncover how glial cells regulate neural development and how their dysfunction contributes to diseases like multiple sclerosis (MS), Alzheimer's disease, and in injuries like stroke.

Although glia represent more than half of the cells in the human brain, fundamental questions remain to be answered. How do glia develop their highly specialized morphologies and interact with neurons to powerfully control form and function of the nervous system? How is this disrupted in neurodegenerative diseases and after injury? By bringing cutting-edge cell biology techniques to the study of glia, we aim to uncover how glia help sculpt and regulate the nervous system and test their potential as novel, untapped therapeutic targets for disease and injury.

We are particularly interested in myelin, the insulating sheath around neuronal axons that is lost in diseases like MS. How do oligodendrocytes- the glial cell that produces myelin in the central nervous system- form and remodel myelin, and why do they fail to regenerate myelin in disease? Our current projects aim to use cell biology and neuroscience approaches to answer these fundamental questions. Ultimately we hope our work will lead to much-needed therapies to promote remyelination in patients.

Teaching

COURSES

2024-25

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Aut)

2023-24

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Aut)

2022-23

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Aut)
- Neuroscience Journal Club and Professional Development Series: NEPR 280 (Aut, Win, Spr)

2021-22

- Neuroscience Journal Club and Professional Development Series: NEPR 280 (Win, Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Yohan Auguste, Clara Bacmeister, Tamara Chan, Jerry Cheng, Jolie Huang, Weaverly Colleen Lee, Andrea Navarrete Vargas, Junhao Xu

Postdoctoral Faculty Sponsor

Eva Daniela De Sousa Maia Carvalho, Duc Huynh, Mable Lam

Doctoral Dissertation Advisor (AC)

Cal Bridges, Madeline Cooper, Emma O'Connell, Nour Omar, Maya Weigel, Kathryn Wu

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biophysics (Phd Program)
- Developmental Biology (Phd Program)
- Neurosciences (Phd Program)
- Stem Cell Biology and Regenerative Medicine (Phd Program)

Publications

PUBLICATIONS

- **Schwann cell-secreted PGE2 promotes sensory neuron excitability during development.** *Cell*
Kantarci, H., Elvira, P. D., Thottumkara, A. P., O'Connell, E. M., Iyer, M., Donovan, L. J., Dugan, M. Q., Ambiel, N., Granados, A., Zeng, H., Saw, N. L., Brosius Lutz, A., Sloan, et al
2024
- **Translating Molecular Approaches to Oligodendrocyte-Mediated Neurological Circuit Modulation.** *Brain sciences*
Song, J., Saglam, A., Zuchero, J. B., Buch, V. P.
2024; 14 (7)
- **Nanobodies against the myelin enzyme CNPase as tools for structural and functional studies.** *bioRxiv : the preprint server for biology*
Markusson, S., Raasakka, A., Schröder, M., Sograte-Idrissi, S., Rahimi, A. M., Asadpour, O., Körner, H., Lodygin, D., Eichel-Vogel, M. A., Chowdhury, R., Sutinen, A., Muruganandam, G., Iyer, et al
2024
- **pHusion: A robust and versatile toolset for automated detection and analysis of exocytosis.** *Journal of cell science*
O'Shaughnessy, E. C., Lam, M., Ryken, S. E., Wiesner, T., Lukasik, K., Zuchero, J. B., Leterrier, C., Adalsteinsson, D., Gupton, S. L.
2024
- **Optical Control of G-Actin with a Photoswitchable Latrunculin.** *Journal of the American Chemical Society*
Vep#ek, N. A., Cooper, M. H., Laprell, L., Yang, E. J., Folkerts, S., Bao, R., Boczkowska, M., Palmer, N. J., Dominguez, R., Oertner, T. G., Pon, L. A., Zuchero, J. B., Trauner, et al
2024
- **SRF transcriptionally regulates the oligodendrocyte cytoskeleton during CNS myelination.** *Proceedings of the National Academy of Sciences of the United States of America*
Iram, T., Garcia, M. A., Amand, J., Kaur, A., Atkins, M., Iyer, M., Lam, M., Ambiel, N., Jorgens, D. M., Keller, A., Wyss-Coray, T., Kern, F., Zuchero, et al
2024; 121 (12): e2307250121
- **Oligodendrocyte calcium signaling promotes actin-dependent myelin sheath extension.** *Nature communications*
Iyer, M., Kantarci, H., Cooper, M. H., Ambiel, N., Novak, S. W., Andrade, L. R., Lam, M., Jones, G., Münch, A. E., Yu, X., Khakh, B. S., Manor, U., Zuchero, et al
2024; 15 (1): 265
- **Focused ultrasound-induced inhibition of peripheral nerve fibers in an animal model of acute pain.** *Regional anesthesia and pain medicine*
Anderson, T. A., Pacharinsak, C., Vilches-Moure, J., Kantarci, H., Zuchero, J. B., Butts-Pauly, K., Yeomans, D.
2023
- **A class of anti-inflammatory lipids decrease with aging in the central nervous system.** *Nature chemical biology*
Tan, D., Konduri, S., Eriksi Ertunc, M., Zhang, P., Wang, J., Chang, T., Pinto, A. F., Rocha, A., Donaldson, C. J., Vaughan, J. M., Ludwig, R. G., Willey, E., Iyer, et al
2022
- **CNS myelination requires VAMP2/3-mediated membrane expansion in oligodendrocytes.** *Nature communications*
Lam, M., Takeo, K., Almeida, R. G., Cooper, M. H., Wu, K., Iyer, M., Kantarci, H., Zuchero, J. B.
2022; 13 (1): 5583
- **Young CSF restores oligodendrogenesis and memory in aged mice via Fgf17.** *Nature*
Iram, T., Kern, F., Kaur, A., Myneni, S., Morningstar, A. R., Shin, H., Garcia, M. A., Yerra, L., Palovics, R., Yang, A. C., Hahn, O., Lu, N., Shuken, et al
2022

- **Clonally Expanded B Cells in Multiple Sclerosis Bind EBV EBNA1 and GlialCAM.** *Nature*
Lanz, T. V., Brewer, R. C., Ho, P. P., Moon, J. S., Jude, K. M., Fernandez, D., Fernandes, R. A., Gomez, A. M., Nadj, G. S., Bartley, C. M., Schubert, R. D., Hawes, I. A., Vazquez, et al
2022
- **Modeling myelin: A toolkit for exploring myelin's mysteries in vitro.** *Developmental cell*
Cooper, M. H., Zuchero, J. B.
2021; 56 (9): 1215–17
- **Label-free optical detection of bioelectric potentials using electrochromic thin films.** *Proceedings of the National Academy of Sciences of the United States of America*
Alfonso, F. S., Zhou, Y., Liu, E., McGuire, A. F., Yang, Y., Kantarci, H., Li, D., Copenhaver, E., Zuchero, J. B., Muller, H., Cui, B.
2020
- **How Support of Early Career Researchers Can Reset Science in the Post-COVID19 World.** *Cell*
Gibson, E. M., Bennett, F. C., Gillespie, S. M., Guler, A. D., Gutmann, D. H., Halpern, C. H., Kucenas, S. C., Kushida, C. A., Lemieux, M., Liddelow, S., Macauley, S. L., Li, Q., Quinn, et al
2020
- **anchors Away: Glia-Neuron Adhesion Regulates Myelin Targeting and Growth** *DEVELOPMENTAL CELL*
Garcia, M. A., Zuchero, J.
2019; 51 (6): 659–61
- **anchors Away: Glia-Neuron Adhesion Regulates Myelin Targeting and Growth.** *Developmental cell*
Garcia, M. A., Zuchero, J. B.
2019; 51 (6): 659-661
- **A Tribute to Ben Barres: Remembrances from Barres Lab Members** *DEVELOPMENTAL CELL*
Eroglu, C., Emery, B., Stevens, B., Daneman, R., Allen, N. J., Ullian, E. M., Zhang, Y., Zuchero, J., Foo, L. C., Agalliu, D., Bennett, M.
2018; 44 (4): 415–19
- **Schwann cells use TAM receptor-mediated phagocytosis in addition to autophagy to clear myelin in a mouse model of nerve injury.** *Proceedings of the National Academy of Sciences of the United States of America*
Brosius Lutz, A., Chung, W. S., Sloan, S. A., Carson, G. A., Zhou, L., Lovelett, E., Posada, S., Zuchero, J. B., Barres, B. A.
2017; 114 (38): E8072-E8080
- **DeActs: genetically encoded tools for perturbing the actin cytoskeleton in single cells** *NATURE METHODS*
Harterink, M., da Silva, M. E., Will, L., Turan, J., Ibrahim, A., Lang, A. E., van Battum, E. Y., Pasterkamp, R. J., Kapitein, L. C., Kudryashov, D., Barres, B. A., Hoogenraad, C. C., Zuchero, et al
2017; 14 (5): 479-?
- **Glia in mammalian development and disease.** *Development*
Zuchero, J. B., Barres, B. A.
2015; 142 (22): 3805-3809
- **CNS Myelin Wrapping Is Driven by Actin Disassembly** *DEVELOPMENTAL CELL*
Zuchero, J. B., Fu, M., Sloan, S. A., Ibrahim, A., Olson, A., Zaremba, A., Dugas, J. C., Wienbar, S., Caprariello, A. V., Kantor, C., Leonoudakus, D., Lariosa-Willingham, K., Kronenberg, et al
2015; 34 (2): 152-167
- **Purification and culture of dorsal root ganglion neurons.** *Cold Spring Harbor protocols*
Zuchero, J. B.
2014; 2014 (8): pdb top073965-?
- **Purification of dorsal root ganglion neurons from rat by immunopanning.** *Cold Spring Harbor protocols*
Zuchero, J. B.
2014; 2014 (8): pdb prot074948-?
- **Intrinsic and extrinsic control of oligodendrocyte development.** *Current opinion in neurobiology*
Zuchero, J. B., Barres, B. A.

2013; 23 (6): 914-920

- **Cytoplasmic actin: purification and single molecule assembly assays.** *Methods in molecular biology (Clifton, N.J.)*

Hansen, S. D., Zuchero, J. B., Mullins, R. D.

2013; 1046: 145-170

- **Actin binding to WH2 domains regulates nuclear import of the multifunctional actin regulator JMY** *MOLECULAR BIOLOGY OF THE CELL*

Zuchero, J. B., Belin, B., Mullins, R. D.

2012; 23 (5): 853-863

- **Between the sheets: a molecular sieve makes myelin membranes.** *Developmental cell*

Zuchero, J. B., Barres, B. A.

2011; 21 (3): 385-386

- **Hts/Adducin Controls Synaptic Elaboration and Elimination** *NEURON*

Pielage, J., Bulat, V., Zuchero, J. B., Fetter, R. D., Davis, G. W.

2011; 69 (6): 1114-1131

- **p53-cofactor JMY is a multifunctional actin nucleation factor** *NATURE CELL BIOLOGY*

Zuchero, J. B., Coutts, A. S., Quinlan, M. E., La Thangue, N. B., Mullins, R. D.

2009; 11 (4): 451-U198

- **In vitro actin assembly assays and purification from Acanthamoeba.** *Methods in molecular biology (Clifton, N.J.)*

Zuchero, J. B.

2007; 370: 213-226