

## **Jerry L. Chen**

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Department of Biology  
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### **Education**

2004-2010      PhD., Massachusetts Institute of Technology, Biology.  
1999-2003      B.A. with Honors, University of California, Berkeley, Molecular and Cell Biology.

### **Positions Held**

2016-present    Assistant Professor, Department of Biology, Boston University  
2016-present    Affiliated Assistant Professor, Department of Biomedical Engineering, Boston University  
2022-present    Affiliated Assistant Professor, Department of Psychological & Brain Sciences, Boston University  
2016-present    Faculty Member, Photonics Center, Boston University  
2016-present    Faculty Member, Center for Systems Neuroscience, Boston University  
2016-present    Faculty Member, Center for Neurophotonics, Boston University  
2011-2016      Post-Doctoral Fellow, Brain Research Institute, University of Zurich (*Helmchen F*)  
2004-2010      PhD Student, Department of Biology, Massachusetts Institute of Technology (*Nedivi E*)  
2003-2004      Senior Research Associate II, University of California, Berkeley (*Hellerstein MK*)

### **Honors and Awards**

2022-2024      Molecular Basis of Cognition Sialog Fellow  
2018-2023      NIH DP2 New Innovator Award  
2017-2020      Whitehall Foundation Research Grant  
2017-2020      Smith Family Awards for Excellence in Biomedical Research  
2017-2019      NARSAD Young Investigator Grant  
2016-2019      Stuart and Elizabeth Pratt Career Development Professorship, Boston University  
2016            Cajal Club Krieg Cortical Kudos Explorer Award  
2016            Federation of European Neuroscience Societies EJN Young Investigator Prize  
2015            Society for Neuroscience Peter and Patricia Gruber International Research Award  
2015            Proteintech and Cell Press Society for Neuroscience Travel Award  
2014-2017      Next Generation Leaders Advisory Council, Allen Institute for Brain Science  
2012-2014      Forschungskredit Post-Doctoral Fellowship, University of Zurich, Switzerland  
2012-2014      International Research Fellowship Program, National Science Foundation, USA

### **Funding**

#### **Active Funding**

<b>NIH DP2 NS111134 New Innovator Award</b> <i>Cracking Genetically Defined Neocortical Circuits Underlying Behavior</i> Role: PI	9/30/2018-6/30/2023
<b>NIH DP2 NS111134 New Innovator Award Diversity Supplement</b> <i>Cracking Genetically Defined Neocortical Circuits Underlying Behavior</i> Role: PI	1/01/2021-12/31/2022
<b>NIH R01 NS109965 BRAIN Initiative Award</b> <i>Cortical Interactions Underlying Sensory Representations</i> Role: PI	9/30/2018-6/30/2023
<b>NIH R01 NS116139</b> <i>Multi-layer Neuronal Imaging with Reverberation Multiphoton Microscopy</i> Role: co-I (PI: Jerome Mertz, BU)	3/15/2020-12/31/2024
<b>Kilachand Fund Award</b> <i>How We Think: Dynamics of Brain Circuits for Problem Solving</i>	10/1/2021-9/30/2024

Role: co-PI (Prime PI: Michael Hasselmo, BU)

**NIH U01 NS128665 BRAIN Initiative Award**

8/15/2022-7/31/2023

*Efficient Two-Photon Voltage Imaging of Neuronal Populations at Behavioral Timescales*

Role: Main Contact PI (co-PI: Michelle Sander, BU; Lei Tian, BU; Vincent Pieribone, Yale)

**NIH U01 MH10907 BRAIN Initiative Award**

9/1/2022–6/30/2027

*Bridging Function, Morphology, and Transcriptomics of Mouse Cortical Neurons*

Role: Co-I (Prime PI: Anton Arkhipov / Marina Garrett, Allen Institute for Brain Science)

***Completed Funding***

**NARSAD Young Investigator Grant**

1/15/2017-1/14/2019

*Neural Circuit Basis for Cortical Oscillations as a Biomarker for Neurological Disorders*

Role: PI

**Smith Awards Program for Excellence in Biomedical Research**

3/1/2017-2/29/2020

*Circuit Mechanisms for Long-Range Communication in the Neocortex*

Role: PI

**Whitehall Foundation Research Grant**

7/1/2017-6/30/2020

*Role for Inter-Areal Cortical Dynamics during Perception*

Role: PI

**NSF NeuroNex Program**

10/1/2017–9/30/2022

*Neurotechnology Hub: Nemonic: Next-Generation Multiphoton Neuroimaging Consortium*

Role: Sub-award (Prime PI: Spencer Smith, UCSB)

**NIH UF1 NS107705 BRAIN Initiative Award**

9/30/2018-8/30/2022

*Population Imaging of Action Potentials by Novel Two-Photon Microscopes and Genetically Encoded Voltage Indicators*

Role: Main Contact PI (co-PI: Michelle Sander, BU; Vincent Pieribone, Yale)

**Harvard/MIT Joint Research Grants Program in Basic Neuroscience**

7/1/2019-12/31/2021

*Cortical Circuits Underlying Categorical Representations*

Role: co-PI (co-PI: Wei-Chung Lee, Harvard Medical School)

**NIH R01 NS109965-S1 BRAIN Initiative Award Diversity Supplement**

9/01/2020-6/30/2022

*Cortical Interactions Underlying Sensory Representations*

Role: PI

**Lab Publications (\*invited reviews)**

1. Lee DG\*, McLachlan CA\*, Kwon O, Carey AE, House G, Lagani G, LeMay D, Nogueira R, Fusi S, **Chen JL<sup>^</sup>**. *Perirhinal cortex learns a predictive map of the task environment. **Under Revision.*** \*Equal contribution
2. Platasa J\*, Ye X\*, Ahrens AM, Liu C, Chen IA, Davison IG, Tian L, Pieribone VA, **Chen JL**. *High-speed low-light in vivo two-photon voltage imaging of large neuronal populations. **Nat Methods. In Press.*** (preprint: <https://biorxiv.org/cgi/content/short/2021.12.07.471668v1>) \*Equal contribution
3. Condylis C, Ghanbari A, Manjrekar N, Bistrong K, Yao SQ, Yao ZZ, Nguyen TN, Zeng HK, Tasic B, **Chen JL**. *Dense functional and molecular readout of a circuit hub in sensory cortex. **Science.*** 2022 Jan 7;375(6576):eabl5981.
4. Clough M, Chen IA, Park SW, Ahrens AM, Stirman JN, Smith SL, **Chen JL**. *Flexible simultaneous mesoscale two-photon imaging of neural activity at high speeds. **Nat Commun.*** 2021 Nov 17; 12(1):6638.
5. Mohr MA, Bushey D, Aggarwal A, Marvin JS, Kim JJ, Marquez EJ, Liang Y, Patel R, Macklin JJ, Lee CY, Tsang A, Tsegaye G, Ahrens AM, **Chen JL**, Kim DS, Wong AM, Looger LL, Schreier ER, Podgorski K.

*jYCaMP: an optimized calcium indicator for two-photon imaging at fiber laser wavelengths.* **Nat Methods.** 2020 Jul;17(7):694-697.

6. Condylis C\*, Lowet E\*, Ni J, Bistrong K, Ouellette T, Josephs N, **Chen JL.** *Context dependent sensory processing across primary and secondary somatosensory cortex.* **Neuron.** 2020 May 6;106(3):515-525.e5.  
\*Equal contribution
7. Clough M, **Chen JL.** *\*Cellular resolution imaging of neuronal activity across space and time in the mammalian brain.* **Curr Opin Biomed Eng.** 2019 Dec;12:95-101.
8. Ni J, **Chen JL.** *\*Long-range cortical dynamics: a perspective from the mouse sensorimotor whisker system.* **Eur J Neurosci.** 2017 Oct;46(8):2315-2324.

### **Prior Publications**

9. Helmchen F, Gilad A, **Chen JL.** *\*Neocortical dynamics during whisker-based sensory discrimination in head-restrained mice.* **Neuroscience.** 2018 Jan 1;368:57-69.
10. Bethge P, Carta S, Lorenzo DA, Egolf L, Goniotaki D, Madisen L, Voigt FF, **Chen JL**, Schneider B, Ohkura M, Nakai J, Zeng H, Aguzzi A, Helmchen F. *An R-CaMP1.07 reporter mouse for cell-type-specific expression of a sensitive red fluorescent calcium indicator.* **PLoS One.** 2017 Jun 22;12(6):e0179460.
11. **Chen JL\***, Voigt F\*, Javadzadeh M, Kruppel R, Helmchen F. *Long-range population dynamics of anatomically defined neocortical networks.* **eLife.** 2016 May 24;5. pii: e14679. \*Equal contribution
12. **Chen JL**, Margolis DJ, Stankov A, Sumanovski LT, Schneider BL, Helmchen F. *Pathway-specific reorganization of projection neurons in somatosensory cortex during learning.* **Nat Neurosci.** 2015 Aug;18(8):1101-1108.
13. Helmchen F, **Chen JL.** *\*Imaging the cortical representation of active sensing in the vibrissa system.* **Sensorimotor Integration in the Whisker System.** Springer, 2015:109-128.
14. Wahl AS, Omlor W, Rubio JC, **Chen JL**, Zheng H, Schroter A, Gullo M, Weinmann O, Kobayashi K, Helmchen F, Ommer B, Schwab ME. *Asynchronous therapy restores motor control by rewiring of the rat corticospinal tract after stroke.* **Science.** 2014 Jun 13;344(6189):1250-1255.
15. **Chen JL**, Andermann ML, Keck T, Xu NL, Ziv Y. *\*Imaging neuronal populations in behaving rodents: paradigms for studying neural circuits underlying behavior in the mammalian cortex.* **J Neurosci.** 2013 Nov 6;33(45):17631-40.
16. **Chen JL\***, Pfaffli O\*, Voigt F, Margolis DJ, Helmchen F. *Online correction of licking-induced brain motion during two-photon imaging with a tunable lens.* **J Physiol.** 2013 Oct 1;591(19):4689-4698.  
\*Equal contribution
17. **Chen JL**, Nedivi E. *\*Highly specific structural plasticity of inhibitory circuits in the adult cortex.* **Neuroscientist.** 2013 Aug;19(4):384-393.
18. **Chen JL**, Carta S, Soldado-Magraner J, Schneider BL, Helmchen F. *Behaviour-dependent recruitment of long-range projection neurons in somatosensory cortex.* **Nature.** 2013 Jul 18;499(7458):336-380.
19. **Chen JL**, Villa KL, Cha JW, So PT, Kubota Y, Nedivi E. *Clustered inhibitory synapse and dendritic spine dynamics in the adult cortex.* **Neuron.** 2012 Apr 26;74(2):361-373.
20. Fujino T, Leslie JH, Eavri R, **Chen JL**, Lin WC, Flanders GH, Borok E, Horvath TL, Nedivi E. *CPG15 regulates synapse stability in the developing and adult brain.* **Genes Dev.** 2011 Dec 15;25(24):2674-2685.
21. **Chen JL**, Flanders GH, Lee WC, Lin WC, Nedivi E. *Inhibitory dendrite dynamics as a general feature of the adult cortical microcircuit.* **J Neurosci.** 2011 Aug 31;31(35):12437-12443.
22. **Chen JL**, Lin WC, Cha JW, So PT, Kubota Y, Nedivi E. *Structural basis for the role of inhibition in facilitating adult brain plasticity.* **Nat Neurosci.** 2011 May;14(5):587-594.
23. **Chen JL**, Nedivi E. *\*Neuronal structural remodeling: is it all about access?* **Curr Opin Neurobiol.** 2010 Oct;20(5):557-62.

24. Lee WC, **Chen JL**, Huang H, Leslie JH, Amitai Y, So PT, Nedivi E. *A dynamic zone defines interneuron remodeling in the adult neocortex*. **Proc Natl Acad Sci U S A**. 2008 Dec 16;105(50):19968-19973.
25. **Chen JL**, Peacock E, Samady W, Turner SM, Neese RA, Hellerstein MK, Murphy EJ. *Physiologic and pharmacologic factors influencing glyceroneogenic contribution to triacylglyceride glycerol measured by mass isotopomer distribution analysis*. **J Biol Chem**. 2005 Jul 8;280(27):25396-25402.

#### **Invited Lectures and Oral Conference Presentations**

- 2023 **OSA Biophotonics Congress: Optics and the Brain**. Vancouver, BC.
- 2023 **SPIE Photonics West. High-Speed Biomedical Imaging and Spectroscopy VIII**. San Francisco, CA.
- 2022 **Medical University of South Carolina, Dept. of Neuroscience**. Charleston, SC.
- 2022 **Northwestern University, Dept. of Neurobiology**. Evanston, IL.
- 2022 **Boston University, Kilachand Day**. Boston, MA.
- 2022 **MIT, Picower Institute 20<sup>th</sup> Anniversary Symposium**. Cambridge, MA.
- 2022 **Merocyanine 540/FLaSh Conference, Marine Biological Laboratory**. Woods Hole, MA.
- 2022 **EPFL, Neuro Symposium Barrel Cortex**. Lausanne, Switzerland.
- 2022 **University of Zurich, Brain Research Institute, 60th Anniversary Symposium**. Zurich, Switzerland.
- 2022 **University of Southern California, Dept. of Biological Sciences**. Los Angeles, CA.
- 2022 **Spatial Omics Zoom Seminar Series VII**. Virtual.
- 2022 **Johns Hopkins University, Dept. of Neuroscience**. Virtual.
- 2021 **Boston University, Dept. of Psychological & Brain Sciences**. Virtual.
- 2021 **University of California, Berkeley, Dept. of Bioengineering**. Virtual.
- 2021 **University of California, Berkeley, Helen Wills Neuroscience Institute**. Berkeley, CA.
- 2021 **Boston University CSN Symposium: Advances in Systems & Computational Neuroscience**. Boston, MA.
- 2021 **University of California, San Diego, Summer Transfer Ahead into Research Training in Neuroscience Program**. Virtual.
- 2021 **NIH BRAIN Initiative Investigators Meeting**. Virtual.
- 2020 **Carnegie Mellon University, Neuroscience Institute**. Virtual.
- 2020 **Cold Spring Harbor Laboratory Meeting, Neuronal Circuits**. Virtual.
- 2019 **Society for Neuroscience Annual Conference: Insights Into Neural Coding and Behavior From Large-Scale Population Recordings Across Cortical Areas Minisymposium**. Chicago, IL. (Chair & Speaker)
- 2019 **University of Bern, Dept. of Physiology**. Bern, Switzerland.
- 2019 **University of Zurich, Brain Research Institute**. Zurich, Switzerland.
- 2019 **OSA Biophotonics Congress: Optics in the Life Sciences**. Tuscon, AZ.
- 2019 **Gordon Research Conference, Dendrites: Molecules, Structure & Function**. Ventura, CA.
- 2019 **Yale University, John B Pierce Laboratory**. New Haven, CT.
- 2019 **Brown University, Dept. of Neuroscience**. Providence, RI.
- 2018 **Barrels Meeting XXXI**. Riverside, CA.
- 2018 **NSF Workshop: Integrating Neuropotonics, Statistical Physics, and Control Theory for Advancing Neuroscience**. Alexandria, VA.
- 2018 **Boston University Medical Center, Dept. of Anatomy and Neurobiology**. Boston, MA.
- 2018 **Computation and Systems Neuroscience (Cosyne) Workshop**. Breckenridge, CO.
- 2017 **Annual Meeting of the Japanese Neuroscience Society**. Tokyo, Japan.
- 2017 **National Institute of Physiological Sciences**. Okazaki, Japan.
- 2017 **Nagoya University**. Nagoya, Japan.
- 2016 **Institute of Neuroscience, Chinese Academy of Sciences**. Shanghai, China.
- 2016 **Cold Spring Harbor Asia Meeting, Probing Circuits with Light: Imaging Structure and Function in the Living Brain**. Suzhou, China.
- 2016 **FENS Forum of Neuroscience**. Copenhagen, Denmark.
- 2015 **Janelia Meeting, Emerging Tools for Acquisition and Interpretation of Whole-Brain Functional Data**. Ashburn, Virginia.
- 2015 **Ohio State University**. Columbus, OH.
- 2015 **Columbia University**. New York, NY.
- 2015 **University of Chicago**. Chicago, IL.
- 2015 **Boston University**. Boston, MA.
- 2015 **Harvard Medical School**. Boston, MA.

2015 **Max Planck Research Group Leader Symposium.** Berlin, Germany.  
 2015 **Ernst Strungmann Institute.** Frankfurt, Germany.  
 2015 **Washington University in St. Louis.** St. Louis, MO.  
 2014 **National Institute of Health.** Bethesda, MD.  
 2014 **Barrels Meeting XXVII.** Washington, DC.  
 2014 **University College London.** London, UK.  
 2014 **Munich Cluster for Systems Neurology.** Munich, Germany.  
 2014 **Allen Institute for Brain Science Showcase Symposium.** Seattle, WA.  
 2014 **Bernstein Conference on Computational Neuroscience.** Goettingen, Germany.  
 2014 **Princeton University.** Princeton, NJ.  
 2014 **University of Basel.** Basel, Switzerland.  
 2014 **University of Cambridge.** Cambridge, UK.  
 2014 **Massachusetts Institute of Technology.** Cambridge, MA.  
 2014 **Salk Institute for Biological Studies.** San Diego, CA.  
 2014 **Northwestern University.** Evanston, IL.  
 2014 **California Institute of Technology.** Pasadena, CA.  
 2013 **Ludwig Maximilian University of Munich.** Munich, Germany.  
 2013 **Society for Neuroscience Annual Conference: Imaging Neuronal Populations in Behaving Rodents: Paradigms for Studying Neural Circuits of Behavior in the Mammalian Cortex Minisymposium.** San Diego, CA. (Chair & Speaker)  
 2013 **Barrels Meeting XXVI.** San Diego, CA.  
 2013 **Max Planck Institute for Biological Cybernetics.** Tuebingen, Germany.  
 2013 **Janelia Meeting, The Neural Basis of Vibrissa-Based Tactile Sensation.** Ashburn, Virginia.  
 2012 **Zurich Center for Imaging Science and Technology.** Zurich, Switzerland.  
 2009 **Gordon Research Conference, Dendrites: Molecules, Structure & Function.** Barga, Italy.

### Teaching Experience

Spring, 2022	Instructor, Sensory Neurobiology (BI520), Boston University
Fall, 2016-20,22	Instructor, Cellular and Systems Neurobiology (BI755), Boston University
Fall, 2022	Guest Lecturer, Neuroplasticity and Perceptual Learning (BE710), Boston University
Spring, 2017-19,22	Guest Lecturer, Neural Systems I: Functional Circuit Analysis (BI741), Boston University
Fall, 2016-2017	Guest Lecturer, Frontiers in Neuroscience (NE 500), Boston University
Fall, 2016-17,19-25	Guest Lecturer, Topics in Biomedical Engineering (BE 790), Boston University
Fall, 2014	Guest Lecturer, Molecular and Cellular Neurobiology, University of Zurich
Fall, 2013	Guest Lecturer, Functional Anatomy of the Rodent Brain, University of Zurich
Fall, 2012	Guest Lecturer, Neuroscience: From Networks to Systems, University of Zurich
September, 2011	Teaching Assistant, EMBO Two-Photon Imaging of Brain Circuits, TU Munich
January, 2008	Teaching Assistant, Neuroscience Module, Instituto Gulbenkian de Ciéncia
Fall, 2007	Teaching Assistant, Introductory Biology (7.013), MIT
Spring, 2006	Teaching Assistant, Introductory Biology (7.014), MIT

### Service at Boston University

2022-present	Associate Director, Neurophotonics Center
2019-present	Executive Committee, Center for Systems Neuroscience
2017, 18, 20	Faculty Search Committee, Dept. of Biology
2018-2019	Faculty Search Committee, Dept. of Biomedical Engineering
2018-2019	Department Retreat Committee, Dept. of Biology
2017, 21	Graduate Program Selection Committee, Dept. of Biology
2017-2018	Qualifying Exam Committee, Dept. of Biomedical Engineering
2016-2017	Faculty Search Committee, Dept. of Psychological and Brain Sciences

### External Service

2022-present	Associate Editor, <i>Science Advances</i>
2022	Study Section, NINDS Outstanding Investigator Review 2023/01 ZNS1 SRB-H (26) S
2019	Ad hoc Reviewer, NSF CAREER Award
2019	Study Section, NIH BRAIN Initiative CSR Special Emphasis Panel 2019/05 ZNS1 SRB-N (18)
2017-present	Associate Editor, <i>Neurophotonics</i>

2016-present Review Editor, *Frontiers in Neural Circuits*  
 2016-present Patent Peer Review Project Expert, Stanford Law School  
 Ad-hoc Review *Neuron, eLife, Nature Methods, Nature Communications, Scientific Reports, Science Advances, Cell Reports, Journal of Neuroscience, European Journal of Neuroscience, Brain Structure & Function, CoSyne Abstracts*

### **Supervised Post-Doctoral Fellows**

2022-present Osung Kwon  
 2019-present Allison Ahrens  
 2019-2020 Abed Ghanbari  
 2017-2019 Eric Lowet  
 2017-2018 Jianguang Ni

### **Supervised PhD Students**

2021-present Alanna Carey – Dept. of Biology, Boston University  
 2021-present Songyang Wang – Dept. of Biomedical Engineering, Boston University  
 2018-present David Lee – Dept. of Biomedical Engineering, Boston University  
 2018-present Caroline Habjan – Dept. of Biology, Boston University  
 2017-present Xin Ye – Dept. of Biomedical Engineering, Boston University  
 2017-present Mitchell Clough – Dept. of Biomedical Engineering, Boston University  
 2017-2021 Cameron Condylis – Dept. of Biomedical Engineering, Boston University

### **Supervised Masters or Undergraduate Students**

2021-present Noah Tan – Dept. of Biology, Boston University  
 2022 Anya Trubelja – Northeastern University Co-op Program  
 2021 Roberto Peralta – NSF REU in Integrated Nanomanufacturing Program  
 2021 Danielle LaMay – Northeastern University Co-op Program  
 2020 Kairav Maniar – Dept. of Biomedical Engineering, Boston University  
 2019-2020 Chen Xin – Dept. of Computer Science, Boston University  
 2019-2020 Anton Gulko – Dept. of Biology, Boston University  
 2019 Jiasen Hou – Northeastern University Co-op Program  
 2017-2018 Koral Cohen – Dept. of Psychological and Brain Sciences, Boston University  
 2016-2017 Gavin Lagani – Dept. of Biology, Boston University  
 2014-2015 Kushagra Alankar – Electrical Engineering and Information Technology, ETH  
 2014-2015 Mitra Javadzadeh – Institute for Neuroinformatics, ETH  
 2014 Petar Ivanov – Institute for Neuroinformatics, ETH  
 2014 Karlis Kandars – Institute for Neuroinformatics, ETH  
 2013-2014 Sievi Lombriser – Electrical Engineering and Information Technology, ETH  
 2013-2014 Atanas Stankov – Institute for Neuroinformatics, ETH  
 2013-2014 Asim Iqbal – Institute for Neuroinformatics, ETH  
 2012 Oliver Pfaffli – Masters of Medicine, University of Zurich  
 2012 Saray Soldado-Magraner – Institute for Neuroinformatics, ETH  
 2012 Joana Soldado-Magraner – Institute for Neuroinformatics, ETH  
 2009 Sonia Afroz – MIT Summer Research Program  
 2008-2009 Mariel Kolzerg – MIT Undergraduate Research Opportunities Program  
 2008 Isabelle Hutchings – Amgen Scholars Program  
 2007 Christopher Jackson – Amgen Scholars Program

### **PhD Thesis Advisory Committee**

2022 Rebecca Rabinovich, Department of Neuroscience, Columbia University  
 2022 Anna Jaffe, Department of Neurobiology, Harvard Medical School  
 2020-present Chloe Ding, Department of Biomedical Engineering, Boston University  
 2019-present Justin Letendre, Department of Biomedical Engineering, Boston University  
 2018-2020 Jean-Marc Ching, Department of Biomedical Engineering, Boston University  
 2017-2020 Timothy Weber, Department of Biomedical Engineering, Boston University  
 2018 Matthias Minderer, Department of Neurobiology, Harvard Medical School