

## Employment and Education

Boston University: Department of Psychological and Brain Sciences, 2017— Present  
Assistant Professor

Harvard University: Center for Brain Science, 2015—2017  
Principal Investigator, Junior Fellow of the Society of Fellows

MIT: Brain and Cognitive Sciences, 2010 — 2015  
Ph.D. student in the laboratory of Susumu Tonegawa, Ph.D.

Tufts University: Visiting Lecturer of Neuroscience, 2014

Boston University: Neuroscience, B.A., *magna cum laude*, 2006 — 2010  
Researcher in the laboratory of Howard Eichenbaum, Ph.D.

## Publications

1. Borzello, M., **Ramirez, S.**, Treves, A. et al.  
Assessments of dentate gyrus function: discoveries and debates.  
*Nat Rev Neurosci* (2023).  
<https://doi.org/10.1038/s41583-023-00710-z>
2. Kinsky, N. R., Orlin, D. O., Ruesch, E. A., Diba, K., & **Ramirez, S.**  
Erasable Hippocampal Neural Signatures Predict Memory Discrimination.  
*bioRxiv* (2023)  
\*Preprint: doi: <https://doi.org/10.1101/2023.02.02.526824>
3. Dorst, Kaitlyn E., Ryan A. Senne, Anh H. Diep, Antje R. de Boer, Rebecca L. Suthard, Heloise Leblanc, Evan A. Ruesch, Steve Ramirez.  
Hippocampal engrams generate flexible behavioral responses and brain-wide network states.  
*BioRxiv* (2023)  
\*Preprint: doi: <https://doi.org/10.1101/2023.02.24.529744>
4. Linghu C, An B, Shpokayte M, Celiker OT, Shmoel N, Zhang C, Park WM, **Ramirez S**, Boyden ES  
Recording of cellular physiological histories along optically readable self-assembling protein chains  
*Nature Biotechnology* (2023) 1-12  
\*Preprint: doi: <https://doi.org/10.1101/2021.10.13.464006>
5. Suthard, R. L., Jellinger, A. L., Shpokayte, M., Surets, M., Pyo, A. Y., Buzharsky, M. D., & **Ramirez, S.**  
Chronic Gq activation of hippocampal neurons and astrocytes differentially affects memory and behavior  
*Neurobiology of Aging*, (2023) Jan 31;125:9-31  
\*Preprint: doi: <https://doi.org/10.1101/2022.09.15.508157>
6. Wilmerding, L. K., Kondratyev, I., **Ramirez, S.**, & Hasselmo, M. E.  
Route-dependent spatial engram tagging in mouse dentate gyrus  
*Neurobiology of Learning and Memory*, (2023), 107738  
\*Preprint: doi: <https://doi.org/10.1101/2022.06.20.496824>
7. Rahsepar, B., Noueihed, J., Norman, J. F., Lahner, B., Quick, M., Ghaemi, K., **Ramirez S**, & White, J. A.  
Theta phase specific modulation of hippocampal memory neurons  
*eLife*, 12, e82697, (2023)  
\*Preprint: doi: <https://doi.org/10.1101/2022.10.27.513992>
8. Suthard, R. L., Senne, R. A., Buzharsky, M. D., Cole, R. H., & **Ramirez, S.**  
Basolateral amygdala astrocytes are engaged by the acquisition and expression of a fear memory.  
*Journal of Neuroscience* (2023) DOI: 10.1523/JNEUROSCI.1775-22.2023  
\*Preprint: doi: <https://doi.org/10.1101/2022.09.11.507456>
9. Finkelstein AB, Leblanc H, Cole R, Gallerani T, Vieira A, Zaki Y, **Ramirez S.**  
Social Reactivation of Fear Engrams Enhances Recall and Reinstatement  
*Proceedings of the National Academy of Sciences* (2022). Cover Issue  
\*Preprint: doi: <https://doi.org/10.1101/2021.01.07.425728>

10. Cincotta C, Ruesch E, Senne R, **Ramirez S**.  
Hippocampal fear engrams modulate ethanol-induced maladaptive contextual generalization in mice.  
*Hippocampus* (2022) 32 (10), 707-715  
\*Preprint: doi: <https://doi.org/10.1101/2022.01.24.477538>
11. Chen, L., Francisco, T. R., Baggetta, A. M., Zaki, Y., **Ramirez, S.**, Clem, R. L., & Cai, D. J.  
Ensemble-specific deficit in neuronal intrinsic excitability in aged mice.  
*Neurobiology of Aging* (2022) 123; 92-97.  
\*Preprint: doi: <https://doi.org/10.1101/2022.06.02.494525>
12. Shpokayte M, Liu S, McKissick O, Hamidi A, Merfeld E, Doucette E, Grella S, Zaki Y, **Ramirez S**.  
Hippocampal cells multiplex positive and negative engrams  
*Nature Communications Biology* (2022). 5 (1), 1009  
\*Preprint: doi: <https://doi.org/10.1101/2020.12.11.419887>
13. Grella SL, Fortin AH, Bladon JH, Reynolds L, Ruesch E, Gross A, Shpokayte M, Cincotta C, Zaki Y, **Ramirez S**.  
Reactivating Hippocampal-Mediated Memories to Disrupt the Reconsolidation of Fear  
*Nature Communications* (2022) DOI 10.1038/s41467-022-32246-8  
\*Preprint: doi: <https://doi.org/10.1101/2021.09.16.460695>
14. Bolsius, Y. G., Heckman, P. R., Paraciani, C., Wilhelm, S., Raven, F., Meijer, E. L., **Ramirez S**, & Havekes, R. Recovering object-location memories after sleep deprivation-induced amnesia.  
*Current Biology* (2022). 23, 2. 298-308.e5  
\*Preprint doi: <https://doi.org/10.1101/2021.05.11.443364>
15. Zaki Y, Mau W, Cincotta C, Merfeld E, Doucette E, Grella S, Shpokayte M, **Ramirez S**.  
Hippocampal and amygdala engrams re-emerge during contextual  
*Neuropsychopharmacology* (2022). 47 (11), 1992-2001  
\*Preprint: doi: <https://doi.org/10.1101/2019.12.19.882795>
16. Cincotta C, Murawski N, Grella S, McKissick O, Doucette E, **Ramirez S**  
Chronic activation of fear engrams induces extinction-like behavior in ethanol-exposed 6 mice  
*Hippocampus*, (2021), 31 (1), 3-10  
\*Preprint: doi: <https://doi.org/10.1101/2020.07.01.182782>
17. Grella SL, Fortin A, McKissick O, Leblanc H, **Ramirez S**.  
Odor Modulates the Temporal Dynamics of Fear Memory Consolidation  
*Learning and Memory*, (2020). (4), 150-163 Cover issue  
\*Preprint: doi: <https://doi.org/10.1101/2019.12.19.881615>
18. Doucette E, Merfeld H, Leblanc H, Monasterio A, Cincotta C, Grella SL, Logan J, **Ramirez S**  
Social behavior in mice following chronic optogenetic stimulation of hippocampal engrams  
*Neurobiology of Learning and Memory*, (2020) 176, 107321  
\*Preprint: doi: <https://doi.org/10.1101/2020.05.28.121822>
19. Chen B, Murawski N, Hamidi A, Merfeld E, Doucette E, Grella S, Shpokayte M, Zaki Y, Fortin A, Cincotta C, **Ramirez S**.  
Artificially suppressing or enhancing hippocampus-mediated memories  
*Current Biology* (2019). 29 (11), 1885-1894. e4
20. LeBlanc H, **Ramirez S**.  
Social modulation of learning and memory  
*The Journal of Neuroscience* (2020), 40 (46), 8782-8798
21. Hamidi A, **Ramirez, S**.  
The majestic case of an amnesic trace  
*Current Biology* (2018) 28 (14), 784-786
22. **Ramirez, S**.  
Crystallizing a memory  
*Science* (2018) 360, 1182-1183
23. Denny C, LeBois E, **Ramirez S**.  
From engrams to pathologies of the brain  
*Frontiers in Neural Circuits* (2017). 11, 1-20
24. **Ramirez S**.  
Supporting the next generation of neuroscientists  
*Neuron* (2016) 92, 559-560
25. **Ramirez S**, Liu X, MacDonald CJ, Moffa A, Zhou J, Redondo R, Tonegawa S.  
Positive memory engrams suppress depression-related behavior  
*Nature* (2015). 522, 335-339. SfN Hot Topic.

26. Tonegawa S, Liu X, **Ramirez S**, Redondo RL.  
Memory engram cells have come of age  
*Neuron* (2015). 87, 918-931.
27. Liu X, **Ramirez S**, Redondo RL, Tonegawa S.  
Identification and manipulation of memory engram cells  
*Cold Spring Harb Symp Quant Biol* (2015). 79, 59-65
28. Redondo RL, Kim J, Arons AL, **Ramirez S**, Liu X, Tonegawa S.  
Bidirectional switch of the valence associated with a hippocampal contextual memory engram  
*Nature* (2014). 513, 426-430
29. **Ramirez S**, Tonegawa S, Liu X.  
Identification and optogenetic manipulation of memory engrams in the hippocampus  
*Frontiers in Behavioral Neuroscience* (2014). 7:226
30. Liu X#, **Ramirez S**#, Tonegawa S.  
Inception of a false memory by optogenetic manipulation of a hippocampal memory engram  
*Philosophical Transactions of the Royal Society of London* (2013) 369, 20130142. Cover article.
31. **Ramirez S**#, Liu X#, Lin PA, Suh J, Pignatelli M, Redondo RL, Ryan TJ, Tonegawa S.  
Creating a false memory in the hippocampus  
*Science* (2013) 341, 387-391. Cover article. SfN Hot Topic.
32. Liu X#, **Ramirez S**#, Pang PT, Puryear CB, Govindarajan A, Deisseroth K, Tonegawa S.  
Optogenetic stimulation of a hippocampal engram activates fear memory recall  
*Nature* (2012) 484, 381-385.
33. Ghosh JG, Fabian, D, Mallat A, **Ramirez S**, Burton M, Casey N, Mocofanesu A, Goldstein LE.  
The molecular chaperone human A $\beta$  crystallin modulates amyloid- $\beta$  neurotoxicity  
*Alzheimer's and Dementia* (2009). 5(4), 304.

#Authors contributed equally

## Awards

### 2022

1. Chan-Zuckerberg Science Diversity Leadership Award
2. Matthew Pecot Fellowship from the McKnight Foundation
3. Pew Foundation Biomedical Scholars
4. HHMI Gilliam Fellowship

### 2021

1. Metcalf Cup and Prize for Excellence in Teaching, BU's highest university-wide prize
2. Quad-L Early Career Award from the University of New Mexico

### 2020

1. College of Arts and Sciences, Templeton Award for Excellence in Student Advising and Mentoring

### 2019

1. PECASE: Presidential Early Career Award Scientists & Engineers
2. NIH Director's Transformative R01 Research Award

### 2018

1. Selected as 1 of 14 Emerging Scholars by *Diverse Issues in Higher Education*.
2. McKnight Memory and Cognitive Disorders Award

### 2016

1. NIH Early Independence Award (DP5)
2. NARSAD Young Investigator Award
3. Gordon Research Conference Travel Award
4. American College of Neuropsychopharmacology Travel Award

### 2015

1. Forbes *30 innovators under the age of 30* award, in the area of Science and Technology
2. National Geographic *Breakthrough Explorer*
3. Office of the Dean for Graduate Education Diversity Fellowship
4. Science News' *Top 10 Bright Young Minds*
5. Science magazine's *Breakthrough of the Year*, runners up for memory manipulation

## 2014

1. Smithsonian magazine's *2014 American Ingenuity Award*, in the area of the Natural Sciences
2. *Top 30 thinkers under the age of 30*, Pacific Standard Magazine

## 2013

1. Technology Review TR35: *World's Top 35 Innovators under the Age of 35* award
2. Walle Nauta Award for Continuing Dedication to Teaching at MIT
3. Science paper voted "Top 10 discoveries of 2013" by *La Recherche*, France
4. Science article proclaimed as Top 10 Most Viewed by F1000

## 2012

1. Angus MacDonald Award for Excellence in Undergraduate Teaching at MIT
2. Nature article classified as Best of the Best and Most Viewed by F1000
3. Best Abstract Award granted by the Molecular and Cellular Program at MIT

## Invited Talks (representative)

### 2023

1. Winter Conference of Neural Plasticity
2. EPFL
3. Pew Foundation
4. McKnight Foundation
5. Hippocampus Spring Meeting
6. University of Alabama
7. MIT
8. Texas A&M
9. University of Wisconsin
10. Department of Defense, Office of Naval Research
11. Society for Neuroscience
12. University of Virginia
13. McLean Hospital
14. MGH
15. Boston University's Matriculation
16. Boston University's RISE program
17. Learning and Memory, University of California Irvine

### 2022

1. COSYNE
2. Society of Biological Psychiatry
3. MIT Picower Institute
4. Gordon Optogenetics
5. Emory University

### 2021

- 1) Rutgers University
- 2) University of Richmond
- 3) University of Birmingham
- 4) University of New Mexico
- 5) Rice University
- 6) EPFL
- 7) Stanford University
- 8) UCSD
- 9) Princeton University
- 10) Albert Einstein College of Medicine
- 11) FENS
- 12) UT Southwestern

### 2020

- 1) Society of Biological Psychiatry
- 2) Society for Neuroscience
- 3) Gordon Research Conference on Optogenetics
- 4) Federation of European Neuroscience Societies
- 5) NIH High Risk High Reward Symposium
- 6) McKnight Foundation Symposium
- 7) National Geographic Explorers' Symposium
- 8) Charles River Association For Memory
- 9) Columbia University
- 10) Pavlovian Society
- 11) Northeastern University
- 12) Faculty for Undergraduates in Neuroscience (FUN)

- 13) MIT
- 14) University of Rochester
- 15) Columbia University

#### 2019

- 1) University of California, Irvine
- 2) Albany College of Medicine
- 3) Tufts University
- 4) Stanford University
- 5) Boston University
- 6) Toronto, HEB70
- 7) Boston University UROP / SURF Program
- 8) NIH
- 9) Dixie College
- 10) University of Calgary
- 11) Weston High School
- 12) Boston University IACUC Seminar
- 13) Gordon Conference, Amygdala
- 14) Boston University Orientation Seminar
- 15) National Geographic Explorer's Symposium
- 16) Society for Neuroscience, Chicago
- 17) NIDA
- 18) Stanford University
- 19) Boston University Clinical Psychology
- 20) ACNP

#### 2018

- 1) Chair: Winter Conference on the Neurobiology of Learning and Memory. January
- 2) Columbia University, NY. January
- 3) University of Michigan, MI. February
- 4) Columbia University, NY. March
- 5) Chair: International Conference on Learning and Memory, Irvine, California. April
- 6) National Geographic, DC. May
- 7) Mount Sinai, NY. June
- 8) Keynote Speaker, Albert Einstein College of Medicine, NY. June
- 9) Max Plank Institute, Germany. June
- 10) National Geographic, DC. June
- 11) Gordon Research Conference, Optogenetics, ME. July
- 12) University of Calgary, Canada. September

#### 2017

- 1) Winter Neural Plasticity, Grenada, January
- 2) Georgetown University, Washington DC
- 3) University of California, Irvine, Kavli Symposium. February
- 4) Society of Biological Psychiatry, CA. May
- 5) Brandeis University, MA. May
- 6) Harvard University, MA. May
- 7) National Geographic, Washington DC. June
- 8) Boston Area Neuroscience Group, MA. June
- 9) National Geographic Symposium, Washington DC. June
- 10) University of Bordeaux, France. June
- 11) University of Toronto, CA. June
- 12) Boston University, MA. July
- 13) University of Calgary, CA. October
- 14) University of Alabama, Birmingham. AL. October
- 15) University of Washington, November
- 16) University of Colorado, Boulder. November

#### 2016

- 1) University of Massachusetts, Boston. April
- 2) MIT Museum, Cambridge Science Festival. April
- 3) UC Berkeley, The Berkeley Forum, CA. Fall
- 4) National Geographic, Explorers Symposium, Washington DC, June.
- 5) Boston University, July.
- 6) Chair: European Biological Psychiatry Society, Netherlands. September
- 7) NIH, MD. October
- 8) Dartmouth College, NH. October
- 9) Northeastern University, MA. October
- 10) Society for Neuroscience, Mini-symposium, CA. November

11) American College of Neuropsychopharmacology, FL. December

#### 2015

- 1) Society for Biological Psychiatry, Toronto. May
- 2) NIH, Behavioral and Social Sciences Research 20th Anniversary, MD. June
- 3) University of Rhode Island, Neuroscience Seminar Series, RI. June
- 4) National Geographic Society, Breakthrough Explorers, MD. June
- 5) McLean Hospital Neuroscience Seminar Series, August
- 6) NIMH, *New Discoveries in Mental Health Research* seminar series, MD. September
- 7) Harvard University, Center for Brain Science, MA. October
- 8) National Geographic, London, England. October
- 9) Kahn Annual Lecture in Neuroscience, Smith College, MA. November

#### 2014

- 1) University College London, Affective Brain Lab Seminar Series, January
- 2) National Institute of Technology, Tiruchirapalli, India. *Pragyan: Techno-management Festival*, February
- 3) Janssen, Spain (Johnson & Johnson Co): Medical Affairs Department, March
- 4) Keynote Speaker: Atlanta's Neuroscience Education and Training Program, Center for Behavioral Neuroscience, March
- 5) Cambridge Science Festival, MA. April
- 6) Harvard University, Department of Neurobiology, MA. September
- 7) FENS 2014, Connectomics workshop, University Bordeaux, France. September
- 8) NIH Blueprint-ENDURE, Washington D.C., November

#### 2013

1. University of Pennsylvania, Department of Biological Chemistry, PA. December
2. Columbia University, Department of Neuroscience, NY. December
3. Molecular Cellular and Cognition Society, CA. November
4. *EmTech*, Neuroengineering: The Future is Now, MA. October
5. MIT's Picower Institute Summer Retreat, MA. May

#### 2012

1. Boston University, College of Arts and Sciences, Program in Neuroscience, MA. March
2. Boston University, Center for Memory and Brain, MA. April
3. MIT, Integrated Neuronal Systems Conference, MA. June
4. MIT, Picower Institute Seminar Series, MA. May
5. MIT, Picower Institute Summer Retreat, MA. June

#### 2010

1. Commencement Speaker: Boston University's Program in Neuroscience
2. Boston University, Annual SURF symposium, MA. May
3. Boston University, Annual UROP symposium, MA. May

## Outreach and Media (representative)

#### 2022

- 1) Univision Podcast with Latino Scientists
- 2) Café RE Podcast series

#### 2021

- 1) Featured in Boston University's BU Today
- 2) 1907 Foundation Mental Health Panel
- 3) Increasing Diversity in STEM Boston University Virtual workshop

#### 2020

- 1) Story Collider
- 2) Bad Science

#### 2019

- 1) Boston University BU Today
- 2) Boston University Podcast Series
- 3) National Geographic Explorer's Symposium

#### 2018

- 1) NPR Science Fridays
- 2) National Geographic Explorer's Symposium
- 3) Science on Film Series
- 4) Science on Tap

## 2017

- 1) Bunker Hill Community College, Careers in Science panel
- 2) Podcast: Science(ish) for Radio Wolfgang
- 3) National Geographic Explorer's Symposium
- 4) Cambridge Science Festival

## 2016

- 1) Science Media and Awards Summit 2016
- 2) National Geographic Explorer's Symposium
- 3) NPR Science Fridays

## 2015

- 1) Featured on National Geographic's *Breakthrough*
- 2) Featured on PBS's Nova Science *Memory Hackers*

## 2014

- 1) TEDxBoston, October
- 2) Loomis Chaffee High School keynote speaker on memory, November

## 2013

- 1) TED, invited speaker
- 2) NPR *Science Fridays* guest discussing memory manipulation
- 3) Featured on the Science channel's *Through the Wormhole* with Morgan Freeman
- 4) Featured on the television series *The Dose with Dr. Billy*
- 5) Invited AMA on reddit to discuss false memories
- 6) Co-host at MIT Museum's *Living in the Future* lecture series
- 7) Science article covered in New York Times, BBC, Forbes, Guardian, CNN, Time, The Economist, Washington Post, The Boston Globe, Nova Science
- 8) WBUR 90.9 science segment guest speaker on memory manipulation
- 9) Digital Village radio show: Los Angeles, guest speaker on false memories

## 2012

- 1) Nature article covered in New York Times, BBC, CNN, Time, Scientific American, New Scientist, and Nova Science
- 2) Featured on the Discovery Channel for memory research

## Teaching

### 2020-2023

1. PS/NE337, Memory Systems (undergraduate), Boston University
2. PS/NE 531, Imagining and Manipulating Memories (undergraduate and graduate), Boston university

### 2019

1. PS/NE504, Contemporary Trends in Neuroscience, Memory Engrams, (undergraduate and graduate), Boston University
2. PS/NE337, Memory Systems (undergraduate), Boston University

### 2014

1. Neuroscience and Hollywood (undergraduate), Tufts University

## References

References available on request