

Academic Appointments

- 2021 – pres. **Associate Professor**, Dept. of Psychological and Brain Sciences, Indiana University
 2015 – 2021 **Assistant Professor**, Dept. of Psychological and Brain Sciences, Indiana University
 2014 – 2015 **Research Assistant Professor**, Dept. of Psychological and Brain Sciences, Boston University

Funding

- 2021 – 2024 **NIH sponsored Collaborative Research in Computational Neuroscience (R01 AG076198)**
 2019 – 2021 **Indiana University Bridge Award (\$69,000)**
 2018 – 2021 **Whitehall Foundation Research Grant (\$225,000)**
 2016 – 2017 **Ralph E. Powe Junior Faculty Enhancement Award from Oak Ridge Associated Universities (\$10,000)**
 2010 – 2013 **NIH Post-doctoral Ruth L. Kirschstein National Research Service Award (NRSA; F32 MH090671)**
 2006 – 2007 **NIH Pre-doctoral Ruth L. Kirschstein National Research Service Award (NRSA; F31 MH077469)**
 2002 – 2005 **NIH Princeton University Training Program in Quantitative Neuroscience (T32 MH065214)**
 2001 & 2002 **NSF Integrative Graduate Education and Research Training Fellowship (IGERT)**

Honors

- 2022, 2018 **Trustee Teaching Award recipient, Indiana University**
 2021 – pres. **Sigma Xi Scientific Research Honor Society, Full Member**

Research Training

- 2008 – 2014 **Boston University, Boston, MA**
 Postdoctoral fellowship in the Department of Psychological and Brain Sciences
 Mentor: Michael Hasselmo
- 2002 – 2008 **Princeton University, Princeton, NJ** (M.S. conferred 5/2004, Ph.D. conferred 5/2008)
 Graduate training in the Department of Psychology
 Mentors: Kenneth Norman (Primary), Jonathan Cohen
 Thesis title: *Testing a model of competition-dependent weakening through pattern classification of EEG*
- 1998 – 2002 **Brandeis University, Waltham, MA** (B.S. conferred May 2002)
 Undergraduate honors research in the Department of Psychology, Neuroscience major
 Mentor: Michael Kahana

Publications

Journal articles published

- Layfield D, Sidell N, Blankenberger K, Newman EL [Hippocampal inactivation during rearing on hind legs impairs spatial memory](#) *Scientific Reports*. 2023; 13, 6136. doi:10.1038/s41598-023-33209-9
- Newman EL, Varley TF, Parakkattu VK, Sherrill SP, Beggs JM [Revealing the Dynamics of Neural Information Processing with Multivariate Information Decomposition](#) *Entropy*. 2022; 24(7), 930. doi:10.3390/e24070930
- Newman EL (2021) [Abstract knowledge gets concrete in the hippocampus](#). *Learning & Behavior*. 2021; 49:345-346. doi:10.3758/s13420-021-00487-0
- Sherrill* SP, Timme NM, Beggs JM, Newman EL [Partial information decomposition reveals that synergistic neural integration is greater downstream of recurrent information flow in organotypic cortical cultures](#). *PLoS Computational Biology*. 2021 July; 17(7): e1009196. doi:10.1371/journal.pcbi.1009196

5. Kútna V, O'Leary VB, **Newman E**, Hoschl C, Ovsepián SV [Revisiting Brain Tuberos Sclerosis Complex in Rat and Human: Shared Molecular and Cellular Pathology Leads to Distinct Neurophysiological and Behavioral Phenotypes.](#) *Neurotherapeutics*. 2021; 18;845-858. doi:10.1007/s13311-020-01000-7.
6. Sherrill* SP, Timme NM, Beggs JM, **Newman EL**. [Correlated activity favors synergistic processing in local cortical networks at synaptically relevant timescales.](#) *Network Neuroscience*. 2020 July; 4(3):678-697. doi:10.1162/netn_a_00141
7. Hernandez* J, Cooper** K, **Newman EL**. [Medial entorhinal cortex activates in a traveling wave in the rat.](#) *eLife*. 2020 Feb; 9. <http://doi.org/10.7554/eLife.52289>
8. Hasselmo ME, Alexander AS, Dannenberg H, **Newman EL**. [Overview of computational models of hippocampus and related structures: Introduction to the special issue.](#) *Hippocampus*. 2020 April; 30(4):295-301. doi:10.1002/hipo.23201
9. Layfield* D, Sidell** N, Abdullahi** A, **Newman EL**. [Dorsal hippocampus not always necessary in a radial arm maze delayed win-shift task.](#) *Hippocampus*. 2020 Feb;30(2):121-129. doi: 10.1002/hipo.23141. PubMed PMID: 31453652
10. Venditto** SJC, Le** B, **Newman EL**. [Place cell assemblies remain intact, despite reduced phase precession, after cholinergic disruption.](#) *Hippocampus*. 2019 Nov;29(11):1075-1090. doi: 10.1002/hipo.23100. PubMed PMID: 31095800; PubMed Central PMCID: PMC6791724.
11. Faber* SP, Timme NM, Beggs JM, **Newman EL**. [Computation is concentrated in rich clubs of local cortical networks.](#) *Network Neuroscience* 2019;3(2):384-404. doi: 10.1162/netn_a_00069. eCollection 2019. PubMed PMID: 30793088; PubMed Central PMCID: PMC6370472.
12. Honey CJ, **Newman EL**, Schapiro AC. [Switching between internal and external modes: A multiscale learning principle.](#) *Network Neuroscience* 2018 Winter;1(4):339-356. doi: 10.1162/NETN_a_00024. eCollection 2018 Winter. PubMed PMID: 30090870; PubMed Central PMCID: PMC6063714.
13. **Newman EL**, Venditto** SJC, Climer JR, Petter** EA, Gillet** SN, Levy** S. [Precise spike timing dynamics of hippocampal place cell activity sensitive to cholinergic disruption.](#) *Hippocampus*. 2017 Oct;27(10):1069-1082. doi: 10.1002/hipo.22753. Epub 2017 Jul 17. PubMed PMID: 28628945; PubMed Central PMCID: PMC5638075.
14. Climer JR, DiTullio R, **Newman EL**, Hasselmo ME, Eden UT. [Examination of rhythmicity of extracellularly recorded neurons in the entorhinal cortex.](#) *Hippocampus*. 2015 Apr;25(4):460-73. doi: 10.1002/hipo.22383. Epub 2014 Nov 25. PubMed PMID: 25331248; PubMed Central PMCID: PMC4457388.
15. **Newman EL**, Hasselmo ME. [Grid cell firing properties vary as a function of theta phase locking preferences in the rat medial entorhinal cortex.](#) *Front Syst Neurosci*. 2014;8:193. doi: 10.3389/fnsys.2014.00193. eCollection 2014. PubMed PMID: 25352787; PubMed Central PMCID: PMC4196519.
16. **Newman EL**, Climer JR, Hasselmo ME. [Grid cell spatial tuning reduced following systemic muscarinic receptor blockade.](#) *Hippocampus*. 2014 Jun;24(6):643-55. doi: 10.1002/hipo.22253. Epub 2014 Feb 19. PubMed PMID: 24493379; PubMed Central PMCID: PMC4028397.
17. Onslow* AC, Hasselmo ME, **Newman EL**. [DC-shifts in amplitude in-field generated by an oscillatory interference model of grid cell firing.](#) *Front Syst Neurosci*. 2014;8:1. doi: 10.3389/fnsys.2014.00001. eCollection 2014. PubMed PMID: 24478639; PubMed Central PMCID: PMC3901010.
18. **Newman EL**, Hasselmo ME. [CA3 sees the big picture while dentate gyrus splits hairs.](#) *Neuron*. 2014 Jan 22;81(2):226-8. doi: 10.1016/j.neuron.2014.01.004. PubMed PMID: 24462091.
19. **Newman EL**, Gillet** SN, Climer JR, Hasselmo ME. [Cholinergic blockade reduces theta-gamma phase amplitude coupling and speed modulation of theta frequency consistent with behavioral effects on encoding.](#) *J Neurosci*. 2013 Dec 11;33(50):19635-46. doi: 10.1523/JNEUROSCI.2586-13.2013. PubMed PMID: 24336727; PubMed Central PMCID: PMC3858632.
20. Climer JR, **Newman EL**, Hasselmo ME. [Phase coding by grid cells in unconstrained environments: two-dimensional phase precession.](#) *Eur J Neurosci*. 2013 Aug;38(4):2526-41. doi: 10.1111/ejn.12256. Epub 2013 May 29. PubMed PMID: 23718553; PubMed Central PMCID: PMC3912569.
21. **Newman EL**, Shay CF, Hasselmo ME. [Malignant synaptic growth and Alzheimer's disease.](#) *Future Neurol*. 2012 Sep;7(5):557-571. doi: 10.2217/fnl.12.47. PubMed PMID: 23420180; PubMed Central PMCID: PMC3571723.

22. **Newman EL**, Gupta K, Climer JR, Monaghan CK, Hasselmo ME. [Cholinergic modulation of cognitive processing: insights drawn from computational models](#). *Front Behav Neurosci*. 2012;6:24. doi: 10.3389/fnbeh.2012.00024. eCollection 2012. PubMed PMID: 22707936; PubMed Central PMCID: PMC3374475.
 23. **Newman EL**, Norman KA. [Moderate excitation leads to weakening of perceptual representations](#). *Cereb Cortex*. 2010 Nov;20(11):2760-70. doi: 10.1093/cercor/bhq021. Epub 2010 Feb 24. PubMed PMID: 20181622; PubMed Central PMCID: PMC2951848.
 24. Hasselmo ME, Brandon MP, Yoshida M, Giocomo LM, Heys JG, Fransen E, **Newman EL**, Zilli EA. [A phase code for memory could arise from circuit mechanisms in entorhinal cortex](#). *Neural Netw*. 2009 Oct;22(8):1129-38. doi: 10.1016/j.neunet.2009.07.012. Epub 2009 Jul 18. Review. PubMed PMID: 19656654; PubMed Central PMCID: PMC2825042.
 25. Norman KA, **Newman EL**, Detre G. [A neural network model of retrieval-induced forgetting](#). *Psychol Rev*. 2007 Oct;114(4):887-953. doi: 10.1037/0033-295X.114.4.887. PubMed PMID: 17907868.
 26. **Newman EL**, Caplan JB, Kirschen MP, Korolev IO, Sekuler R, Kahana MJ. [Learning your way around town: how virtual taxicab drivers learn to use both layout and landmark information](#). *Cognition*. 2007 Aug;104(2):231-53. doi: 10.1016/j.cognition.2006.05.013. Epub 2006 Aug 1. PubMed PMID: 16879816.
 27. *Norman KA, ***Newman E**, Detre G, Polyn S. [How inhibitory oscillations can train neural networks and punish competitors](#). *Neural Comput*. 2006 Jul;18(7):1577-610. doi: 10.1162/neco.2006.18.7.1577. PubMed PMID: 16764515.
* indicates shared first authorship.
 28. Norman KA, **Newman EL**, Perotte AJ. [Methods for reducing interference in the Complementary Learning Systems model: oscillating inhibition and autonomous memory rehearsal](#). *Neural Netw*. 2005 Nov;18(9):1212-28. doi: 10.1016/j.neunet.2005.08.010. Epub 2005 Nov 2. PubMed PMID: 16260116.
 29. Ekstrom AD, Kahana MJ, Caplan JB, Fields TA, Isham EA, **Newman EL**, Fried I. [Cellular networks underlying human spatial navigation](#). *Nature*. 2003 Sep 11;425(6954):184-8. doi: 10.1038/nature01964. PubMed PMID: 12968182.
 30. Caplan JB, Madsen JR, Schulze-Bonhage A, Aschenbrenner-Scheibe R, **Newman EL**, Kahana MJ. [Human theta oscillations related to sensorimotor integration and spatial learning](#). *J Neurosci*. 2003 Jun 1;23(11):4726-36. PubMed PMID: 12805312.
- * after a name indicates a pre-doctoral or post-doctoral mentee supervised by EL Newman for that publication.
** after a name indicates a undergraduate mentee supervised by EL Newman for that publication.

Book chapters

Norman, K.A., Quamme, J.R., **Newman, E.L.** (2009). Multivariate methods for tracking cognitive states. In F. Rösler, C. Ranganath, B. Röder, & R. H. Kluwe (Eds.), *Neuroimaging in Human Memory: Linking cognitive processes to neural systems*. New York: Oxford University Press.

Selected Presentations at Scientific Meetings

Newman, E.L., (2022) Visual exploration is a key epoch of hippocampal-dependent spatial memory encoding. *Presentation at the 45th Annual Winter Conference on the Neurobiology of Learning and Memory, Park City, UT.*

Newman, E.L., (2020) Optogenetic silencing of dorsal CA1 during rearing impairs spatial working memory. *Presentation at the 44th Annual Winter Conference on the Neurobiology of Learning and Memory, Park City, UT.*

Faber, S.P., Timme, N.M., Beggs, J.M., **Newman, E.L.** (2019) Correlation drives computation in local cortical networks at synaptically relevant timescales. *Annual meeting of the Society for Neuroscience, Chicago, IL.*

Layfield D.M., Hernández J., Schritter B., **Newman, E.L.** (2019) Acetylcholine supports EC-CA1 coupling by suppressing competing drivers. *Annual meeting of the Society for Neuroscience, Chicago, IL.*

Sidell NP, Newman EL, Blankenberger K. (2019) Does spatial memory require hippocampus during orienting behavior? *Annual meeting of the Society for Neuroscience, Chicago, IL.*

Faber, S.P., Timme, N.M., Beggs, J.M., **Newman, E.L.** (2019) Correlation drives computation in local cortical networks at synaptically relevant timescales. *Meeting of the Indiana Chapter of the Society for Neuroscience.*

Faber, S.P., Timme, N.M., Beggs, J.M., **Newman, E.L.** (2018) Decoding the elements of neural computation. *Annual meeting of the Society for Neuroscience, San Diego, CA.*

Hernandez-Perez, J.J., Cooper, K., **Newman, E.L.** (2018) Is theta a traveling wave in the medial entorhinal cortex? *Annual meeting of the Society for Neuroscience, San Diego, CA.*

Layfield, D., Sidell, N., Abdullahi, A., **Newman, E.L.** (2018) Dorsal Hippocampus not necessary in a Delayed Spatial Win-shift Radial Arm Maze. *Annual meeting of the Society for Neuroscience, San Diego, CA.*

Newman, E.L., Hernández, J.J. (2018) Theta waves along the dorsal-ventral axis of the rat MEC. *Presentation at the 42st Annual Winter Conference on the Neurobiology of Learning and Memory, Park City, UT.*

Faber, S.P., Timme, N.M., Beggs, J.M., **Newman, E.L.** (2017) Neural computation by strong connections in cortical networks. *Society for Neuroscience abstracts.*

Venditto, S.J., Hasselmo, M.E., **Newman, E.L.** (2017) Hippocampal phase precession results from cholinergic gating of entorhinal input. *Society for Neuroscience abstracts.*

Newman, E.L. (2017) Hippocampal-cortical interactions and cholinergic modulation in navigation (and memory?). *Presentation at the 50th Annual Winter Conference on Brain Research, Big Sky, MT.*

Newman, E.L. (2017) Network neuroscience: Finding neural computation in the rich club. *Presentation at the 41st Annual Winter Conference on the Neurobiology of Learning and Memory, Park City, UT.*

Newman, E.L. (2015) Rhythms of neural information processing and their cholinergic conductor. *Presentation at the 39th Annual Winter Conference on the Neurobiology of Learning and Memory, Park City, UT.*

Newman, E. L., Gillet, S. N., Climer, J. R., Hasselmo, M. E. (2013) Falling on deaf ears: gamma generation impaired following systemic administration of the cholinergic antagonist scopolamine in rats. *11th Annual Alzheimer's Disease Research Day, Boston University.*

Newman, E. L., Gillet, S. N., Climer, J. R., Hasselmo, M. E. (2013) Speed modulation of theta frequency and theta-gamma coupling diminished following systemic scopolamine administration. *Society for Neuroscience abstracts.*

Newman, E. L., Gillet, S. N., Climer, J. R., Hasselmo, M. E. (2012) Effects of cholinergic modulation on interactions of entorhinal cortex and hippocampus as measured by theta modulation of high and low gamma in the rat. *Society for Neuroscience abstracts.*

Newman, E.L., Hasselmo, M.E. (2011) Grid cells and acetylcholine: Role of muscarinic modulation in theta rhythmicity and spatial tuning of grid cell firing fields. *Society for Neuroscience abstracts.*

Gillet, S.N., **Newman, E.L.**, Hasselmo, M.E. (2011) Projected stimuli sufficient for successful learning in a conditional discrimination forced choice task. *Society for Neuroscience abstracts.*

Newman, E.L., Abi-Karam, A., Bogaard, A., Hasselmo, M.E. (2010) Analysis of grid cell spatial firing patterns in the rat during manipulations of optic flow. *Society for Neuroscience abstracts.*

Newman, E.L., Norman, K.A. (2008) Suppressing perceptual representations through partial activation. *Society for Neuroscience abstracts*.

Newman, E.L., Norman, K.A. (2007) Using EEG pattern classification to track competition in negative priming. *Cognitive Neuroscience Society meeting*, New York, NY.

Newman, E.L., Gobbini, I., Bryan, R., Haxby, J., Norman, K.A. (2006) Sub-trial classification of categorical perception in EEG. *Annual meeting of the Organization for Human Brain Mapping*.

Newman, E.L., Norman, K.A. (2003) A Neural Network Model of Retrieval-Induced Forgetting. *Cognitive Neuroscience Society meeting*, New York, NY.

Ekstrom, A.D., Fried, I., **Newman, E.L.**, Caplan, J.B., Kahana, M.J. (2002) Cellular Correlates of Human Spatial Navigation. *Society for Neuroscience abstracts*.

Caplan, J.B., Madsen, J.R., **Newman, E.L.**, Kahana, M.J. (2002) Oscillatory Correlates of Exploratory and Goal-Seeking Behavior in Humans. *Society for Neuroscience abstracts*.

Invited talks

- Feb. 13, 2020 – Seminar speaker
Behavioral Neuroscience Group, **University of Illinois at Urbana-Champaign**
Title: “When does the hippocampus do its ‘hippocampal-dependent’ encoding in a delayed-win-shift task in rats?”
Champaign, IL
(attendance ~30)
- Nov. 12, 2019 -Round table discussant
Cognitive Regime Shift II – When/why/how the brain breaks, **Santa Fe Institute**
Santa Fe, NM
(attendance ~16)
- Apr. 28, 2019 –Keynote presentation
6th International Symposium on Brain and Cognitive Science, **Yeditepe University**
Title: “Tracking Neural Information Processing in the Brain and in the Dish”
Istanbul, Turkey
(attendance ~450)
- Mar. 22, 2019 – Invited short talk
Greater Indiana Society for Neuroscience (IN-SFN) annual meeting
Title: “Tracking Neural Information Processing in the Brain and in the Dish”
Indianapolis, IN
(attendance ~200)
- Feb. 18, 2019 –Departmental special seminar
Department of Psychology, **Vanderbilt University**
Talk title: “Tracking Neural Information Processing in the Brain and in the Dish”
Nashville, TN
(attendance ~45)
- Nov. 13, 2015 –Seminar
Mathematical Neuroscience Group, **Indiana University – Purdue University at Indianapolis**
Talk title: “Rhythms of Neural Information Processing and their Cholinergic Conductor”
Indianapolis, IN
(attendance ~25)

SERVICE

Journal peer-review service

Review editor:
 Frontiers in Systems Neuroscience

Co-guest editor:
 Hippocampus special issue Spring 2020 ‘*Computational models of hippocampus and related structures*’

Ad-hoc reviewing:

ACS Chemical Neuroscience	Journal of Neuroscience
Behavioural Brain Research	Journal of Neurophysiology
Behavioral Neuroscience	Journal of Psychopharmacology
Brain and Behavior	Learning & Memory
Brain Research	Nature Communications
Cell Reports	Network Neuroscience
Cerebral Cortex	NeuroImage
Current Biology	Neuroscientist
Developmental Psychology	PLOS ONE
European Journal of Cognitive Psychology	Psychological Review
Frontiers in Cellular Neuroscience	Psychonomic Bulletin & Review
Frontiers in Systems Neuroscience	Psychopharmacology
Hippocampus	Progress in Neurobiology
Journal of Computational Neuroscience	Progress in Neuropsychopharm & Biol Psychiatry

Grant peer-review service

2022 NSF (CRCNS) – Ad Hoc
 2022 NIH (LMDN) – Full panelist
 2021 NIH (LMDN) – Full panelist
 2019 Alzheimers Association – Ad Hoc
 2019 Clinical and Translational Sciences Institute (CTSI) - Panelist
 2019 Medical Research Council (MRC) NMHB - Ad Hoc
 2017 NSF (BIO-IOS) – Full panelist
 2017 Human Frontier Science Program – Ad Hoc

Graduate thesis committees

2021 – present	Katy Hagen	Thesis committee	Indiana University – Physics
2020 – 2022	Ningyao Geng	Thesis committee chair	Indiana University – Psych & Brain
2019 – present	Huzi Cheng	Thesis committee	Indiana University – Psych & Brain
2017 – present	Dylan Layfield	Thesis committee chair	Indiana University – Neuroscience
2017 – 2018	Abolfazl Alipour	Thesis committee chair	Indiana University – Psych & Brain
2016 – 2021	Samantha Faber	Thesis committee chair	Indiana University – Psych & Brain
2017 – 2020	Hadi Hafizi	Thesis committee	Indiana University - Physics
2017 – present	Josh Barnathan	Thesis committee	Indiana University - Physics
2017 – 2019	Nathaniel Kinsky	Thesis committee	Boston University
2016 – 2020	Danielle Panoz	Thesis committee	Indiana University – Psych & Brain
2016 – 2017	Adrian Barr	Thesis committee	Indiana University – Psych & Brain

Department service

2021 – 2022 Developmental Psychology Hire search committee member
 2020 Gil Center Endowed Chair Hire search committee

- 2018 – present NTT advisory committee for Dr. Kendra Bunner
- 2018 – present Harlan Family Scholars Selection Committee
- 2015 – present Undergraduate Program Committee – Member
- 2017 – 2018 Faculty Search Committee Member – Emerging Area of Research (EAR)
- 2016 – 2018 Graduate Recruitment Chair – MSN area group
- 2016 – 2017 Undergraduate Career Task Force – Member

Community service

- 2017 Sponsored and coached ‘Students Teaching About Research and Science’ undergraduate outreach program
 - Visited 12 regional public high schools and to inform students about getting involved in research
- 2017-2018 Member of Vibe Yoga Scholarship Fund selection committee
- 10/2017, 2018 Hosted ‘Touch my brains’ outreach booth at ‘Celebrate Science Indiana’
 - Had over a dozen different types of brains for kids to hold and examine to build brain awareness

Media attention

- 07/2019 ‘Second Summer Research Student Dexter Wu-Corts Studies the Hippocampus and Memory Recollection’
 by Daniela Molina, Office of Engaged Learning, Indiana University. Posted on Office blog and promoted on
 Twitter and Facebook.

TEACHING

Courses taught

PSY-P346	‘Neuroscience’ Lecture-based course on foundations of neuroscience required of all PBS students.																																							
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PSY-P426	‘Lab in Behavioral Neuroscience’ Intimate lab-based course offering authentic training in contemporary methods in behavioral neuroscience including completion of a novel experiment.																																							
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2016 spring	30538	14
2016 fall	33789	9
2017 fall	11643	11
2020 spring	29625	11
2022 spring	12419	10

COGS-Q355/ 'Neural networks in the brain'

COGQ-Q590 Programming intensive course examining the connections between modern artificial intelligence and the neural systems of the brain that accomplish similar functions.

Term:	Section	Enrolled
2021 spring	10700 + 13488	5 + 3

Doctoral trainees

2020 – 2022 **Ningyao Geng**
 2017 – present **Dylan Layfield**
 2016 – 2021 **Samantha Faber**

Postdoctoral trainees

2017 – present **Blanca Erika Gutiérrez-Guzmán**
 2016 – present **Jesús Hernández-Pérez**

Selected prior pregraduate mentees

2017 – 2020 **Kevin Blankenberger** Undergraduate research assistant
 Optogenetics • Animal behavior
 Honors thesis title: *Inactivating The Dorsal Hippocampus During Rearing, But Not at Reward Sites, Impairs Spatial Working Memory in an 8-Arm Delayed Win-Shift Task*

2016 – 2020 **Nathan Sidell** Undergraduate research assistant
 Optogenetics • Animal behavior
 Now: Masters of Public Health at University of Puget Sound
 Honors thesis title: *Dorsal Hippocampus CA1 Activity During Rearing Behavior at Encoding Aids in Later Recall in the 8-Arm Delayed-Win-Shift Task*

2017 – 2019 **Daniel Calderón Sanchez** Undergraduate research assistant
 Animal behavior • Histology
 Now: Laboratory technician, UCLA (Lab of Hongwei Dong)
 Honors thesis title: *Hippocampal Area Ca3 Projects More Broadly to Area Ca1 than Does Entorhinal Cortex*

2016 – 2019 **Keiland Cooper** Undergraduate research assistant
 Animal behavior • Data analysis • Computational modeling
 Now: PhD student, UC Irvine (Lab of Norbert Fortin)
 Completed honors thesis: *Cholinergic Modulation May Explain Hippocampal Encoding And Retrieval Mode Switching*

2016 – 2018 **Brianna Le** Undergraduate research assistant
 Animal behavior • Rat electrophysiology
 Graduate of Cornell University MBA program

2015 – 2017	Sarah Venditto Animal behavior • Rat electrophysiology • Programming intensive data analysis Now: PhD student, Princeton University (Lab of Carlos Brody)	Laboratory technician
2013 – 2015	Samuel Levy Animal behavior • Rat electrophysiology • Microdialysis • Programming intensive data analysis Now: PhD student, Boston University (Lab of Howard Eichenbaum & Marc Howard)	Research assistant
2012 – 2014	Elijah Petter Animal behavior • Rat electrophysiology Now: PhD student, Duke University (Lab of Warren Meck)	Undergraduate research assistant
2011, 2013	Mitchell Morton Animal behavior • Rat electrophysiology Now: PhD student, Yale University (Lab of Anirvan Nandy)	High school research program
2010 – 2012	Shea Gillet Animal behavior • Rat electrophysiology Received PhD in neuroscience from UCSD 2017 (Lab of Jeffrey Isaacson)	Undergraduate research assistant
2011	Angel Patricio Lara Animal behavior Now: Graduate of Bunker Hill Community College	Program for at-risk high school students in the Boston area