STEPHEN L. COWEN, PH.D.

Associate Professor
Director of the Cognition and Neural Systems Graduate Program
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RESEARCH OVERVIEW

My laboratory seeks to understand how the coordinated activities of neurons support navigation, movement, and the formation of lasting memories. We also explore how disrupted patterns of neuronal coordination contribute to age-associated memory decline, Parkinson's disease, Alzheimer's disease, and chronic pain. Furthermore, my colleagues and I develop novel technologies for visualizing and modulating brain activity, measuring dopamine release, and quantifying behavior.

CHRONOLOGY OF EDUCATION

2007-2008 *The Neurosciences Institute* *San Diego, CA*
Postdoctoral Fellow Advisor: Dr. Douglas A. Nitz
I investigated how the activities of ensembles of neurons in the hippocampus and prefrontal cortex contribute to cost-benefit decision making and spatial navigation.

2007 *University of Arizona* *Tucson, AZ*
Ph.D. Psychology, minor Neuroscience Advisor: Dr. Bruce McNaughton
I investigated the neural mechanisms underlying working memory, navigation, and memory consolidation using neural ensemble recordings in behaving animals.
Dissertation: "Selective Delay Activity in the Medial Prefrontal Cortex: The Contribution of Sensory-Motor Information and Expectation"

1992 *University of Wisconsin* *Madison, WI*
B.A., Business Administration, Dean's List.

CHRONOLOGY OF EMPLOYMENT

2019-present *The University of Arizona* *Tucson, AZ*
Associate Professor, Psychology Department
Member of the following UA Graduate Interdisciplinary Programs (GIDP): Neuroscience, Cognitive Science, Physiological Sciences, Applied Biosciences, and Biomedical Engineering.

2012-2019 *The University of Arizona* *Tucson, AZ*
Assistant Professor, Psychology Department
Member of the following UA Graduate Interdisciplinary Programs (GIDP): Neuroscience, Cognitive Science, Physiological Sciences, and Biomedical Engineering.

2010-2012 *The Neurosciences Institute* *San Diego, CA*
Associate Fellow, Neuroscience

2008-2010 *The Neurosciences Institute* *San Diego, CA*
Research Fellow, Neuroscience

1996-1997 *The Lytton Neuroscience Laboratory* *Madison, WI*
Computer System Administrator and Programmer

1992-1994 *The United States Peace Corps* *Roatán, Honduras*
Microbusiness consultant, water and solar consulting, volunteer

SERVICE

Committees:

2026	**Head of Faculty Search Committee (Psychology): Search for tenure track cognitive/neuro/psychology faculty.**
2026	**Organized the Cognition and Neural Systems (CNS) Faculty Data Blitz.**
2024-2026	**Head of the Cognition and Neural Systems (CNS) graduate program in Psychology.**
2025-2026	**Member of Faculty Search Committee (Psychology): Search for tenure track cognitive/neuro/psychology faculty.**
2024-2026	**Member Faculty Executive Advisory Committee (FEAC, Psychology).** This committee directly advises the department head and leads policy changes and the APR review process.
2025	**Invited Grant Reviewer: Arizona Alzheimer's Consortium (March 2025).**
2024	**Panelist and organizer: Graduate Career Advisory Panel (11/2024)**
2024	**Faculty Host: For visiting computational neuroscientist Tim Lewis (UC Davis) for his visit March 21.**
2023	**Panelist: Work-life Balance.** A discussion for graduate students, faculty, and staff in the University of Arizona Psychology Department (organized by Dr. Jamie Edgin). (2/17/2023)
2022-2026	**Host, organizer, and emcee: the Neuroscience Data Blitz. 4 events/year at the Museum of Contemporary Art, Tucson, AZ.**
2022-2026	**Member: Neuroscience Graduate Interdisciplinary Program (GIDP) Executive Committee, University of Arizona.**
2025-2026	**Lead of the Strategic Priorities Faculty Initiative (SPFI) CNS faculty search.**
2024-2025	**Member Faculty Advisory Committee (FEAC, Psychology)**
2023-2025	**Member Faculty Awards Committee (Psychology)**
2024-2025	**Head of Faculty Search Committee (Psychology):** Search for tenure track computational cognitive/neuro/psychology faculty.
2024-2025	**Interim Head of the Cognition and Neural Systems (CNS) graduate program (Psychology)**

2022-2025	**Host, organizer, and emcee:** the University of Arizona, Neuroscience Data Blitz. 4 events/year at the Museum of Contemporary Art, Tucson, AZ. (GIDP)
2022-2025	**Member:** Neuroscience Graduate Interdisciplinary Program (GIDP) Executive Committee, University of Arizona.
2022-2025	**Director:** NIH/NIDA sponsored U. Arizona Center for Excellence in Addiction Studies (CEAS) Pilot grant project. **We Awarded >$170,000 in internal UA grants since 2022**
2020-2024	**Member: Graduate Training in Applied Statistics (GTAS) committee**
2020-2021	**Sabbatical**
2021	Ad-hoc NIH grant reviewer.
2021	**Member of the University of Arizona Healthy Aging Seed Grant review panel ($75,000 distributed to 3 awardees), University of Arizona.**
2021	**External Member and Examiner:** Graduate Committee for Ali Mashhoori, U Alberta, Lethbridge Canada.
2020	**Chair:** Undergraduate Curriculum Committee, Psychology Department
2019	**Chair:** Undergraduate Curriculum Committee, Psychology Department
2019	**Member:** Neuroscience Graduate Curriculum Committee
2019	**Host and emcee:** the Neuroscience Data Blitz, Tucson, AZ
2019	**External Member and Examiner:** Graduate Committee for Saeedeh Hashemniayetorshizi, U Alberta, Lethbridge Canada.
2018	**Chair/Organizer:** Parkinson's Disease Data Blitz: M. of Contemporary Art
2018	**Chair:** Undergraduate Curriculum Committee, Psychology Department
2018	**Chair:** Nugent Award Selection Committee, Psychology Department
2018	**Chair:** Michelle Villegas Award Committee, Psychology Department
2018	**Chair:** Galileo Award Committee, Psychology Department
2018	**Member:** Graduate Training in Applied Statistics (GTAS) committee
2018	**Member:** Teaching Faculty Search Committee, Psychology Department
2012-present	**Mentor:** for more than 50 undergraduate and 5 high school students
2013-present	**Member:** masters, prelim, or doctoral committees for 19 graduate students
2013-present	**Member:** Undergraduate Curriculum Committee, Psychology Department
2017	**Member:** McKnight Brain Institute Scientific Advisory Board
2017	**Member:** Graduate Training in Applied Statistics (GTAS) committee
2017	**Chair:** Faculty Search Committee, Psychology Department

2016 **Chair:** Faculty Search Committee, Psychology Department

2016 **Member:** Graduate Student Admission Committee, Neuroscience GIDP

2015 **Chair:** *Ad hoc* Grade Appeal Committee, University

2015 **Chair:** Outstanding Senior Selection Committee, Psychology Department

2015 **Member:** Faculty Search Committee, Psychology Department

2015 **Member:** Faculty Search Committee, Neuroscience Department

2015 **Member:** Graduate student admission committee, Neuroscience GIDP

2014 **Member:** Outstanding Senior Selection Committee, Psychology Department

2014 **Member:** Faculty Search Committee, Neuroscience Department

Peer-Review:

2012-present **Invited referee for peer-reviewed journals:** Neuron, The Journal of Neuroscience, Heliyon, Neuroscience Letters, Frontiers in Neuroscience, Journal of Neuropharmacology, Cerebral Cortex, Current Biology, Molecular Neurodegeneration, eNeuro, Hippocampus, Heliyon, Future Medicine: Nanotechnology, Neurotherepeutics, JoVE, IBRO Reports, Current Opinion in Behavioral Sciences, Journal of Neural Engineering, ACS Chemical Neuroscience, PLOS Biology, Neurobiology of Aging, Behavioral Brain Research, Cell Reports, PNAS.

Other:

2025 **Invited Grant Reviewer:** Arizona Alzheimer's Consortium (March 2025)

2024 **Panelist and organizer:** Graduate Career Advisory Panel (11/2024)

2024 **Faculty Host:** For visiting computational neuroscientist Tim Lewis (UC Davis) for his visit on March 21

2023 **Panelist:** Work-life Balance. A discussion for graduate students, faculty, and staff in the University of Arizona Psychology Department (organized by Dr. Jamie Edgin). (2/17/2023)

2021 **Ad-hoc NIH grant reviewer**

2019 **Host and emcee:** the Neuroscience Data Blitz, Tucson, AZ

2018: **Panelist:** Careers panel discussion for the Undergraduate Research Opportunities Consortium (UROC) given at the Integrated Learning Center. I regularly accept UROC and Summer Institute for Medical Ignorance (SIMI) students in the laboratory and support the diversity efforts of these programs.

2016 **Panelist:** Career advisory panel for undergraduate students in the Neuroscience and Cognitive Sciences program with Anita Koshi and Lynne Oland

2016 **Grant Reviewer:** Michael J Fox Foundation

2015	**Host and emcee:** the Neuroscience Data Blitz, Tucson, AZ
2015	**Host:** Laboratory promotion event for District 2 Representative Rossana Gabaldón, Tucson, AZ
2015	**Faculty host:** For **Ralph Greenspan,** Ph.D. (UCSD), At University of Arizona, Neuroscience Seminar Series Talk: "The Fruit Fly and the B.R.A.I.N. Initiative."
2014	**Grant Reviewer:** Arizona Alzheimer's Disease Core Center
2014	**Host and emcee:** the Neuroscience Data Blitz, Tucson, AZ
2014	**Faculty host:** For **Doug Nitz, Ph.D**. (UCSD), University of Arizona CNS Seminar Series Talk: "Cell Assemblies of the Basal Forebrain"
2013	**Panelist:** Career advisory panel for undergraduate students in the Mind, Brain, and Behavior program.

OUTREACH

Interview: U. Arizona Alumni Magazine (April 2025). This features our work investigating Parkinson's disease and ketamine.

Radio interview: KVOI Tucson AZ, "Jump In Tucson" (Jan. 2025) https://player.amperwavepodcasting.com/?feed-link=https%3A%2F%2Frss.amperwave.net%2Fv2%2Fepisode%2F7144293_2025-01-10-182433

Radio interview: KJZZ Phoenix AZ (Jan. 2025) https://www.kjzz.org/kjzz-news/2025-01-06/ua-study-may-open-the-door-for-ketamine-to-ease-side-effects-of-parkinsons-drug

University of Arizona News Interview (Jan. 2, 2025) " Brain study challenges long-held views about Parkinson's movement disorders" https://news.arizona.edu/news/brain-study-challenges-long-held-views-about-parkinsons-movement-disorders

Woods Hole Neural Systems & Behavior summer course instructor (2023, 2024). Invited instructor and lecturer for the 2-week intensive course in neurobiology hosted at the Massachusetts Marine Biological Laboratories at Woods Hole, MA.

Tucson Festival of Books Presenter (2014-2025, March). Each year, my students and I volunteer at the Festival of Books to teach children about neuroscience and the scientific process. We use our in-house Jell-O Brain neurophysiology demonstration kit to demonstrate how scientists measure electrical brain activity. The event is attended by >100,000 people.

Sabino Canyon "Stars at Sabino" Science Outreach (May 2022, Tucson). My students and I (students did most of the work) used our in-house Jell-O B the Brain neurophysiology demonstration kit to demonstrate neuroscience to visitors at Sabino Canyon.

Invited Speaker for the Alzheimer's Foundation (March 31, 2021).

Science and Entertainment Exchange (National Academy of Sciences). *Ad hoc* scientific consultant (unpaid). Worked with Lisa Gold on television-series script involving out of body experiences. Feb 2020.

Organizer and creator of the B-the-Brain program for teaching K-12 students about neuroscience. Local schools and The Tucson Festival of Books**.** Jan**-**March 2020. Tucson, AZ.

Invited Speaker: UA Retired Faculty Dinner. "The Aging Mind and Brain", July 2019. Tucson, AZ.

Invited Speaker: Sun City Oro Valley (SCOV) Active Health Committee. "How our brains learn and remember and the impact of age", Feb 15, 2019. Oro Valley, AZ.

Invited Speaker: Tucson Science Fiction Writers Association. "Dopamine, Neuroscience, and Science Fiction", Feb 2, 2019. Tucson, AZ.

Speaker: Tucson Community Science Café. "Your Brain on Dopamine.", Jan 15, 2019. Tucson, AZ.

B the BRAIN: B the BRAIN was developed by Dr. Cowen and graduate student Matthew Schmit (now a postdoc) as an interactive computer and gelatin-based brain demonstration kit. This kit and curriculum allow K-12 students to "poke" electrodes into an electronic responsive brain, allowing the students to explore hypotheses about what the artificial brain is sensing. B the Brain is a recurring interactive exhibit at the Flandrau Science Center (Tucson) and the Tucson Festival of Books. It has also been presented at local high schools, the Tucson Library (S.Y.STEM program), St. Cyril's K-8 school, and three middle schools. The design of B the Brain and the curriculum that we developed was presented at the Society for Neuroscience meeting (Nov. 2016).

Blast Off Summer Camp Brain Demonstration. Summer 2017. Students presented a 60-minute active electrophysiology demonstration at a Tucson science summer camp.

Science and Entertainment Exchange (National Academy of Sciences). *Ad hoc* scientific consultant (unpaid). Worked with Sid Mohanty Fall 2016 and Spring 2018 on Hollywood script development about parietal hemineglect (~20 hours of research, conference calls, and emails).

Speaker/Organizer: Flandrau Science Center "Drugs and the Brain" Science Café Series (5 talks by 5 neuroscientists). Title: "Brain waves, drugs, and the chemical basis for hallucinations.", Tucson, AZ, Spring 2016.

Arizona Public Media NPR broadcast interview with Dr. Leslie Tolbert. I described my research in memory and decision-making. Tucson, AZ, Spring 2015.

Speaker: Arizona Integrated Wellness Cooperative (AIWC). Title: "Memories are made of this: How our brains create the past." Tucson, AZ, September 22, 2015.

Speaker: NAWBO Women's Business Wellness Workshop, "Move it or lose it: How our bodies empower our brains", Tucson, AZ January 12, 2015.

Podcast presentations: As a part of my graduate class (Neural Mechanisms of Decision Making), we collaborated with a 6th grade class in Port Washington, Wisconsin. In this

collaboration, my students produced 10 brief podcasts and videos describing neuroscience research. We also received great feedback from the 6th graders. Tucson, AZ, Spring 2015.

Presenter: Tucson Festival of Books. Assisted with the cockroach neuroscience hands-one demonstration that teaches K-12 children about nerve conduction. Tucson, AZ, Spring 2014.

Presenter: Science in the City. "Effort, Risk, and Parkinson's Disease", Tucson Electric Power Building, Tucson, AZ, Spring 2013.

PUBLICATIONS

Peer-reviewed Journals:

Current and former trainees are underlined, * Work done as a graduate student, [c] A collaborator
https://www.ncbi.nlm.nih.gov/myncbi/stephen.cowen.1/bibliography/public/

Poorna Pillutla, S. V., Skoda, M. J., Ishii, A., Bernard, K., Corenblum, M. J., Montgomery, T., Wene, P., Menakuru, N., Kraszewski, J. N., Billheimer, D., Winter, G. M., **Cowen, S. L.,** & Madhavan, L. (2026). Acute E2/P4 loss compromises the biology and function of neurogenic niches during a vulnerable female aging period. Stem cell reports, 102814. Advance online publication. https://doi.org/10.1016/j.stemcr.2026.102814

Srivathsa, S., Sponseller, M. X., **Cowen, S. L.**, & Barnes, C. A.[c] (2026). Older Rats Switch Between Distinctly Different Behavior Strategies to Solve the Spatial Version of the Morris Watermaze. Hippocampus, 36(1), e70064. https://doi.org/10.1002/hipo.70064

Falk, T.[C], **Cowen, S. L.** (2025). Motor cortex in levodopa-induced dyskinesia: Systems and molecular changes after sub-anesthetic ketamine treatment. *Neural Regeneration Research*. https://doi.org/10.4103/NRR.NRR-D-25-00176

Bartlett, M. J., Stopera, C. J., **Cowen, S. L.**, Sherman, S. J., & Falk, T[c]. (2025). Differential effects of statins on the anti-dyskinetic activity of sub-anesthetic ketamine. Neuroscience Letters, 138114. https://doi.org/10.1016/j.neulet.2025.138114

Vishwanath, A., Bartlett, M. J., Falk, T., & **Cowen, S. L**. (2025). Decoupling of motor cortex to movement in Parkinson's dyskinesia rescued by sub-anaesthetic ketamine. *Brain: A Journal of Neurology*, awae386. https://doi.org/10.1093/brain/awae386 PMID: 39585797

Press related to this publication:

U. Arizona Alumni Magazine interview (April 2025, in press). This features our work investigating Parkinson's disease and ketamine.

Radio interview: KVOI Tucson AZ https://player.amperwavepodcasting.com/?feed-link=https%3A%2F%2Frss.amperwave.net%2Fv2%2Fepisode%2F7144293_2025-01-10-182433

Radio interview: KJZZ Phoenix AZ https://www.kjzz.org/kjzz-news/2025-01-06/ua-study-may-open-the-door-for-ketamine-to-ease-side-effects-of-parkinsons-drug

University of Arizona News Interview (Jan. 2, 2025) " Brain study challenges long-held views about Parkinson's movement disorders" https://news.arizona.edu/news/brain-study-challenges-long-held-views-about-parkinsons-movement-disorders

Neuroscience News: https://neurosciencenews.com/ketamine-parkinsons-dyskinesia-28303/

PsyPost https://www.psypost.org/breakthrough-study-shows-how-ketamine-may-ease-dyskinesia-in-parkinsons-patients/

Lillo Vizin, R.C., Ito, H., Kopruszinski, C.M., Ikegami, M., Ikegami, D., Yue, X., Navratilova, E., Moutal, A., **Cowen, S.L.**, Porreca, F[c]., (2024). Cortical kappa opioid receptors integrate negative affect and sleep disturbance. Transl Psychiatry 14, 417. https://doi.org/10.1038/s41398-024-03123-3

Hamilton, A.R., Vishwanath, A., Weintraub, N.C., **Cowen, S.L.**, Heien, M.L[c]., (2024) Dopamine Release Dynamics in the Nucleus Accumbens Are Modulated by the Timing of Electrical Stimulation Pulses When Applied to the Medial Forebrain Bundle and Medial Prefrontal Cortex. ACS Chem Neurosci 15, 2643–2653. PMID: 38958080 https://doi.org/10.1021/acschemneuro.4c00115

Jordan, G.A., Vishwanath, A., Holguin, G., Bartlett, M.J., Tapia, A.K., Winter, G.M., Sexauer, M.R., Stopera, C.J., Falk[c], T., **Cowen, S.L.**, (2024). Automated system for training and assessing reaching and grasping behaviors in rodents. Journal of Neuroscience Methods 401, 109990. PubMed PMID: 37866457 https://doi.org/10.1016/j.jneumeth.2023.109990

Liu Y, Lim K, Sundman M, Ugonna C, Ton That V, **Cowen S**, Chou YH (2022) Association between responsiveness to transcranial magnetic stimulation and interhemispheric functional connectivity of sensorimotor cortex in older adults. Brain Connect. 2022 May 27;. doi: 10.1089/brain.2021.0180. PMID: 35620910.

Crown L.M., Gray DT, Schimanski LA, Barnes CA[c], **Cowen S.L.** (2022) Aged rats exhibit altered behavior-induced oscillatory activity, place cell firing rates, and spatial information content in the CA1 region of the hippocampus. J Neurosci. Apr 27;. doi: 10.1523/JNEUROSCI.1855-21.2022. PubMed PMID: 35477900.

Liu, Y., Lim, K., Sundman, M., Ugonna, C., That, V. T., **Cowen, S**., & Chou, Y. (2021). Interhemispheric functional connectivity of sensorimotor cortex predicts responsiveness of transcranial magnetic stimulation in older adults. Brain Stimulation, 14(6), 1683. https://doi.org/10.1016/j.brs.2021.10.303

Izadi, A., Schedlbauer, A., Ondek, K., Disse, G., Ekstrom, A. D., **Cowen, S.L.**, Shahlaie, K., & Gurkoff, G.G. (2021). Early Intervention via Stimulation of the Medial Septal Nucleus Improves Cognition and Alters Markers of Epileptogenesis in Pilocarpine-Induced Epilepsy. Frontiers in Neurology, 12. https://doi.org/10.3389/fneur.2021.708957

Ye, T., Bartlett, M. J., Sherman, S. J., Falk, T[C]., & **Cowen, S. L**. (2021). Spectral signatures of L-DOPA-induced dyskinesia depend on L-DOPA dose and are suppressed by ketamine. Experimental Neurology, 340, 113670. https://doi.org/10.1016/j.expneurol.2021.113670

Ondek K, Pevzner A, Tercovich K, Schedlbauer AM, Izadi A, Ekstrom AD, **Cowen SL**, Shahlaie K, Gurkoff GG [C]. (2020). Recovery of Theta Frequency Oscillations in Rats Following Lateral Fluid Percussion Corresponds With a Mild Cognitive Phenotype. Front Neurol [Internet] 11:600171. Available from: http://www.ncbi.nlm.nih.gov/pubmed/33343499

Seaton BT, Hill DF, **Cowen SL**, Heien ML[C] (2020) Mitigating the Effects of Electrode Biofouling-Induced Impedance for Improved Long-Term Electrochemical Measurements In Vivo. Anal Chem 92:6334–6340. Available from: http://www.ncbi.nlm.nih.gov/pubmed/32298105

Siegenthaler JR, Gushiken BC, Hill DF, **Cowen SL**, Heien ML[C] (2020) Moving Fast-Scan Cyclic Voltammetry toward FDA Compliance with Capacitive Decoupling Patient Protection. ACS sensors 5:1890–1899.

Cowen SL, Gray DT, Wiegand JL, Schimanski LA, Barnes CA[C] (2020) Age-associated changes in waking hippocampal sharp-wave ripples. Hippocampus. 2020 Jan;30(1):28-38. doi: 10.1002/hipo.23005. Epub 2018 Nov 11. PubMed PMID: 29981255; PubMed Central PMCID: PMC6322975.

Bartlett MJ, Flores AJ, Ye T, Smidt SI, Dollish HK, Stancati JA, Farrell DC, Parent KL, Doyle KP, Besselsen DG, Heien ML [C], **Cowen SL**, Steece-Collier K, Sherman SJ [C], Falk T [C] (2020) Preclinical evidence in support of repurposing sub-anesthetic ketamine as a treatment for L-DOPA-induced dyskinesia. Exp Neurol 333.

Crown LM, Bartlett MJ, Wiegand J-PL, Eby AJ, Monroe EJ, Gies K, Wohlford L, Fell MJ, Falk T [C], **Cowen SL** (2020) Sleep Spindles and Fragmented Sleep as Prodromal Markers in a Preclinical Model of LRRK2-G2019S Parkinson's Disease. Front Neurol [Internet] 11. Available from: https://www.frontiersin.org/article/10.3389/fneur.2020.00324/full

Spanó G, Gómez RL, B. Demara M, **Cowen SL**, Edgin JE [C] (2018) REM sleep in naps differentially relates to memory consolidation in typical preschoolers and children with Down syndrome. *Proc Natl Acad Sci U S A,* Nov., 115:11844–11849.

Ye T, Bartlett MJ, Schmit MB, Sherman SJ [C], Falk T [C], **Cowen SL** (2018) Ten-Hour Exposure to Low-Dose Ketamine Enhances Corticostriatal Cross-Frequency Coupling

and Hippocampal Broad-Band Gamma Oscillations. *Front. Neural Circuits* 12, 61. doi: 10.3389/fncir.2018.00061

Cowen SL, Phelps, CE, Navratilova E [c], McKinzie DL, Okun A, Husain, BS, Gleason SD, Witkin JM, Porreca F [C] (2018) Chronic pain impairs cognitive flexibility and engages novel learning strategies in rats. Pain doi:10.1097/j.pain.0000000000001226 (Editor's Choice article)

Hill DF, Parent KL, Atcherley CW, **Cowen SL** and Heien ML [C] (2017) Differential release of dopamine in the nucleus accumbens evoked by low-versus high-frequency medial prefrontal cortex stimulation. Brain Stimul doi:10.1016/j.brs.2017.11.010.
Note: Cowen is corresponding author. Cowen and Heien contributed equally.

Lewis SA, Negelspach DC, Kaladchibachi S, **Cowen SL**, Fernandez F [C] (2017) Spontaneous alternation: A potential gateway to spatial working memory in Drosophila Neurobiol Learn Mem 142:230–235. doi:10.1016/j.nlm.2017.05.013.

Parent KL, Hill DF, Crown LM, Wiegand J-P, Gies KF, Miller MA, Atcherley CW, Heien ML [C], **Cowen SL** (2017) Platform to Enable Combined Measurement of Dopamine and Neural Activity. Anal Chem 89:2790–2799.

Okun A, McKinzie DL, Witkin JM, Remeniuk B, Husein O, Gleason SD, Oyarzo J, Navratilova E, McElroy B, **Cowen SL**, Kennedy JD, Porreca F [C] (2016) Hedonic and motivational responses to food reward are unchanged in rats with neuropathic pain. Pain 157:2731–2738.

Wiegand J-PL, Gray DT, Schimanski LA, Lipa P, Barnes CA [C], **Cowen SL** (2016) Age Is Associated with Reduced Sharp-Wave Ripple Frequency and Altered Patterns of Neuronal Variability. J Neurosci 36:5650–5660.

Cowen SL, Nitz DA [C] (2014) Repeating Firing Fields of CA1 Neurons Shift Forward in Response to Increasing Angular Velocity, J Neurosci, 34(1):232-41.

Miller MA, Thomé A, **Cowen SL** (2013) Intersection of Effort and Risk: Ethological and Neurobiological Perspectives, Frontiers in Neuroscience, 7:208.

Cowen SL, Davis GA, Nitz DA [C] (2012) Anterior cingulate neurons in the rat map anticipated effort and reward to their associated action sequences. Journal of Neurophysiology 107(9):2393–2407.

*__Cowen, SL__ and McNaughton, BL (2007) Selective delay activity in the medial prefrontal cortex of the rat: The contribution of sensory-motor information and contingency. Journal of Neurophysiology, 98(1):303-16.

*Maurer, AP, **Cowen, SL**, Burke, SN, Barnes, CA and McNaughton, BL (2006) Phase precession in hippocampal interneurons showing strong functional coupling to individual pyramidal cells. The Journal of Neuroscience, 26:13485-13492.

*Maurer, AP, **Cowen, SL**, Burke, SN, Barnes, CA and McNaughton, BL (2006) Organization of hippocampal cell assemblies based on theta phase precession. Hippocampus, 16:785-794.

*Battaglia, FP, Sutherland, GR, **Cowen, SL**, McNaughton, BL and Harris, KD (2005). Firing rate modulation: A simple statistical view of memory trace reactivation. Neural Networks, 18:1280-1291.

*McNaughton, BL, Barnes, CA, Battaglia, FP, Bower, MR, **Cowen, SL**, Ekstrom, AD, Gerrard, JL, Hoffman, KL, Houston, PF, Karten, Y., Lipa, P, Pennartz, CMA. and Sutherland, GR (2003) Off-line reprocessing of recent memory and its role in memory consolidation: A progress report. In: P. Maguet, C. Smith and B. Stickgold (Eds.) Sleep and Brain Plasticity. Oxford University Press: United Kingdom, pp. 225-246.

Invited Review:

Nitz D, **Cowen S**. Crossing borders: sleep reactivation as a window on cell assembly formation. Nature Neuroscience. 2008;11(2):126–8.

Intellectual Property:

Cowen S.L., Heien M.H. [C], U.S Patent Application (Ser. No., PCT/US16/46396) entitled "Methods and Systems for Near Simultaneous Measurement of Neuron Activity and Neurotransmitter Concentration" filed on 8/10/2016.

Cowen S.L., Heien M.H. [C], U.S Provisional Patent Application (Ser. No., 62/218, 994) entitled "Methods and Systems for Near Simultaneous Measurement of Neuron Activity and Neurotransmitter Concentration" filed on 9/15/2015.

Ph.D. Dissertation:

Cowen S.L., Selective Delay Activity in the Medial Prefrontal Cortex: The Contribution of Sensory-Motor Information and Expectation (2007). The University of Arizona.

WORKS IN PROGRESS

Holguin G, Jorgensen K, Tapia A, Jordan G, Vishwanath A, Barnes CA [C], **Cowen SL**
Opposing responses of hippocampal theta oscillations to running and bimanual fine-motor movement. *Under review: iScience (2026).*

CREATIVE ACTIVITY

I create laser-cut etchings inspired by or adapted from the work of Nobel Prize winning neuroanatomist Santiago Ramón y Cajal (1852-1934). Media: wood, paper, metal, fabric, leather, and acrylic. This art has been displayed and auctioned at the following events…

- U. Arizona Neuroscience and Cognitive Science Undergraduate Program Art Auction (2022, 2023). Artwork was donated to help fund this student group.
- U. Arizona Symbiosis: An Exhibit of Biological Art (2022, 2023).

MEDIA

Open Source Software:

Reaching and Grasping Analysis and Automation Toolbox. Companion code for Jordan, G.A., Vishwanath, A., Holguin, G., Bartlett, M.J., Tapia, A.K., Winter, G.M., Sexauer, M.R., Stopera, C.J., Falk[c], T., **Cowen, S.L.**, (2024). Automated system for training and assessing reaching and grasping behaviors in rodents. Journal of Neuroscience Methods 401, 109990. https://doi.org/10.1016/j.jneumeth.2023.109990 https://github.com/CowenLab/String_Pulling_System

Lickometer: An open-source package of Matlab and Arduino (C) software and 3D printer files for building a system for detecting the timing and force of licking for the analysis of reward consumption. (https://github.com/CowenLab/LickSensor)

WaveformCutter: An open-source software tool for real-time and off-line identification of single-neuron spiking activity from physiological recordings. WaveformCutter is integrated into the popular spike-sorting program MClust 3.5. I am also a contributing author to the MClust source code (https://github.com/adredish/MClust-Spike-Sorting-Toolbox)

In the media and videos:

01/03/2025 "Ketamine Offers Hope for Parkinson's Treatment-Linked Dyskinesia." Neuroscience News
https://neurosciencenews.com/ketamine-parkinsons-dyskinesia-28303/

01/03/2025 "Ketamine Restores Movement Control in Parkinson's Patients"; Technology Networks Drug Discovery
https://www.technologynetworks.com/drug-discovery/news/ketamine-restores-movement-control-in-parkinsons-patients-394655

01/03/2025 Stephanie Price: "Ketamine can help address dyskinesia in Parkinson's, reveals study"; Neuro Rehab Times
https://nrtimes.co.uk/ketamine-can-help-address-dyskinesia-in-parkinsons-reveals-study/

01/03/2025 "New insights into uncontrollable movements in Parkinson's disease patients"; Medical News
https://www.news-medical.net/news/20250103/New-insights-into-uncontrollable-movements-in-Parkinsons-disease-patients.aspx

01/06/2025 Kamal Kant Kohli, MD: "New insights into uncontrollable movements in Parkinson's disease patients"; Medical Dialogues
https://medicaldialogues.in/neurology-neurosurgery/news/brain-study-challenges-long-held-views-about-parkinsons-movement-disorders-141076

01/07/2025 Patricia Inácio, PhD: "Study unveils mechanisms behind levodopa-induced dyskinesia"; Parkinson's News Today
https://parkinsonsnewstoday.com/news/study-finds-mechanisms-behind-levodopa-induced-dyskinesia/?cn-reloaded=1

Allison Eby (Student research assistant in my lab) spoke about our research on KXCI, a Tucson radio Station on "Thesis Thursday" (June. 2019):
https://ubrp.arizona.edu/allison-eby-on-kxcis-thesis-thursday-5-30-19/

Erin Mamaril (Student research assistant in my lab) spoke about our research on KXCI, a Tucson radio Station on "Thesis Thursday" (Aug. 2018):
https://ubrp.arizona.edu/erin-mamaril-on-kxcis-thesis-thursday-8-30-18/

Cowen, SL "Four Questions: Chronic Pain and How It Affects the Brain" University of Arizona interview. University Communications (May 2018):
https://uanews.arizona.edu/story/four-questions-chronic-pain-and-how-it-affects-brain?utm_source=uanow&utm_medium=email&utm_campaign=
Also released in the UA Alumni magazine: http://arizonaalumni.com/article/four-questions-chronic-pain-and-how-it-affects-brain

Wiegand J-PL, **Cowen, SL,** "Memory-related brainwaves occur less often in old age" Arizona Daily Star Science Supplement, p. 18, 1/29/2017.
http://arizonadailystar.az.newsmemory.com/?special=College+of+Science

UA Researchers Develop Brain-Mapping Technology. UA Now article describing an NIH R24 grant in which I am a co-investigator with Dr. Russel Witte.
https://uanews.arizona.edu/story/ua-researchers-develop-brain-mapping-technology
Also covered in Cronkite news.
http://cronkitenews.azpbs.org/2016/09/16/ua-researchers-aim-to-look-deep-inside-the-brain/
And the Arizona Sentinel:
http://www.tucsonsentinel.com/local/report/091916_abi_brain/ua-researchers-developing-new-way-look-deep-inside-brain/

Cowen, S.L., Heien, M.A. 2015 Video report and interview for NSF Brain Initiative grant awardees:
http://www.nsf.gov/discoveries/disc_videos.jsp?cntn_id=135837&media_id=79376&org=NSF

Cowen, S.L., Heien, M.A. 2015 Video interview for UA Now regarding collaborative research and technology development: http://uanews.org/videos/lab-two-heads-are-better-one

Cowen, S.L. KUAZ Arizona Public Media NPR Science interview with Dr. Leslie Tolbert entitled "How the brain makes up its mind" December 2015.

Cowen, S.L. "Is memory in your brain, body or both?" Arizona Daily Star, Sunday Dec. 1, 2013.

CONFERENCES/SCHOLARLY PRESENTATIONS

Invited talks and consultation:

Invited speaker: Neuroscience GIDP Faculty Data Blitz Neural synchrony, space, and time., Jan. 2026.

Invited speaker: Cognition and Neural Systems Data Blitz Neural synchrony, space, and time., Feb. 2026.

Invited speaker: Cognitive Science Symposium. Tucson AZ. Title: "Action everywhere all at once: Neural synchronization to movement in the hippocampus, prefrontal cortex, and motor cortex.", Sept. 2025.

Invited speaker: Woods Hole Oceanographic Institute. Title: "Space, Ensembles, and Oscillations", Woods Hole MA, July 12, 2024.

Invited speaker: McKnight Brain Institute Meeting. Title: "Advances in the simultaneous measurement and manipulation of neural ensemble activity and neuromodulator release", Birmingham AL, May 14, 2024.

Winter Conference on Neural Plasticity (WCNP). Title: "Motion, age, and hippocampal rhythms", Puerto Vallarta, Mexico, Feb 21, 2024. https://www.wcnpmeet.org/

Invited speaker: McKnight Brain Institute Meeting. Title: "The influence of aging on the capacity of the hippocampus to respond to sensory and spatial input", Atlanta GA, May 1, 2023.

Invited speaker: Woods Hole Oceanographic Institute. Title: "Space, Ensembles, and Oscillations", Woods Hole MA, July 10, 2023.

Invited Speaker: University of Arizona Center for Excellence in Addiction Research (CEAS). "Chronic pain, kappa opioid receptors, and sleep.", Feb 15, 2023. Tucson, AZ. In-person.

Invited Speaker: University of Arizona Neuroscience Data Blitz. "Age-associated changes in hippocampal gamma oscillations, place-cell firing rates, and spatial information content", Dec 2, 2021. Tucson, AZ. In-person.

Invited Speaker: Alzheimer's Association Public Forum. "Age, sleep, and memory", March 31, 2021. Virtual: Tucson and Hawaii.

Invited Speaker: Biomedical Engineering Seminar. "Neural synchrony in health and disease", Feb 15, 2021. Tucson, AZ.

Invited Speaker: Neuroscience Data Blitz. "Neural Synchrony, Memory, and Parkinson's Disease", Oct 13, 2020. Tucson, AZ.

Invited Speaker: U Nevada, Las Vegas. "The Plastic Hippocampus: Shifting Place Fields, Memory Consolidation, and Aging", Sept. 2020. Las Vegas, NV. (This became a Zoom talk due to COVID-19 precautions)

Invited Speaker: "Regulation of Dopamine Release, Oscillations and Memory Consolidation" Univ. Alberta, Lethbridge Canada, Aug 16, 2019.

Panel Speaker: Undergraduate Research Opportunities Consortium (UROC) for underrepresented students. Panel on preparation for graduate admission, June 2019. Tucson, AZ.

Invited Speaker: UA Retired Faculty Dinner. "The Aging Mind and Brain", May 2019. Tucson, AZ.

Invited Speaker: Sun City Oro Valley (SCOV) Active Health Committee. "How our brains learn and remember and the impact of age", Feb 15, 2019. Oro Valley, AZ.

Invited Speaker: Tucson Science Fiction Writers Association. "Dopamine, Neuroscience, and Science Fiction", Feb 2, 2019. Tucson, AZ.

Speaker and Organizer: Parkinson's Disease Data Blitz. "Neural Synchrony and Parkinson's Disease", Nov 20, 2018. Tucson, AZ.

Invited Speaker: Georgetown University. "Neural Synchrony, Memory, Aging, and Parkinson's Disease", Oct 23 2018. Washington, DC.

Invited Speaker: New Mexico EEG, Translation, and Behavior Meeting. "Neural Synchrony, Memory, Aging, and Parkinson's Disease", Aug 2 2018. Albuquerque, NM.

Invited Speaker: The UA Cognitive Science Colloquium. "Ketamine and Neural Synchrony", Sep 14 2018. Tucson, AZ.

Invited Speaker: The UA Psychology Colloquium. "Aging, Oscillations, and Memory Formation", Oct 31 2018. Tucson, AZ.

Invited Speaker: Learning and Memory Conference. "Aging-related changes in neuronal oscillations", Apr 2018. Huntington Beach, CA.

Invited Speaker: Arizona Psychology Undergraduate Research Conference "Brain Oscillations, Drugs, and Pain", Mar 17, 2018. Phoenix, AZ.

Video Presentation: "Tools for Measuring Neural Activity", Presented within Arunava Majumdar's (IBM Center for Advanced Studies) talk entitled "Neuro-Electro-Chemical Transmitter Analytics Research", IBM Cloud University Conference. Berlin, Germany, Oct 10, 2017.

Invited speaker: Mayo Clinic Brain Initiative Symposium, "Integrated Measurement of Dopamine Release and Large-Scale Ensemble Activity in Behaving Animals", Rochester, MN, Apr 1, 2017.

Invited speaker: U of Arizona Neuroscience DataBlitz "Brains, oscillations, aging, and memory", Tucson AZ, Jan 23, 2017.

Invited poster presenter: NSF/NIH Brain Initiative Investigators Meeting. "A system for the combined measurement of dopamine and neural activity (DANA)", Bethesda, MD, Dec 13, 2016.

Invited speaker: U of Arizona Brain Initiative Collaboration DataBlitz "Synchronous neuronal activity, Parkinson's disease, and ketamine", Tucson AZ, Dec 7, 2016.

Invited speaker: U of Arizona Neural Systems and Cognitive Sciences Seminar "Brains, oscillations, aging, and Parkinson's disease", Tucson AZ, Dec 6, 2016.

Invited speaker: Michael J Fox Foundation Consortium Progress Update "Identification of network and oscillatory signatures of the LRRK2 mutation", Oct 23, 2017, Video presentation.

Grant Proposal Presentation: To **Northrop Grumman** (with Dr. Bob Wilson) "Biologically-inspired algorithms for solving the explore-exploit dilemma", Tucson, AZ, Nov 1, 2016, Video presentation.

Invited speaker: Taormina Pain Mechanisms and Therapeutics Conference, "Ketamine and its impact on corticostriatal-limbic interactions", June 10, 2016, Taormina, Italy.

Invited speaker: U. of Arizona, Title: "Brains, oscillations, aging, and Parkinson's disease", Undergraduate Program in Biology. Tucson, AZ, May 25, 2016.

Invited speaker: Emory University. "Effort-reward decision making: Neural systems and neuromodulation", Atlanta, GA. March 8, 2016

Invited speaker: Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy national convention. "Simultaneous Detection of Dopamine Release and Multiple Single-Unit Activity in Awake and Behaving Rats", Atlanta, GA. March 7, 2016

Invited speaker: Arizona Integrated Wellness Cooperative (AIWC). "Memories are made of this: How our brains create the past." Tucson, AZ, September 22, 2015.

Faculty host: For **Ralph Greenspan,** Ph.D. (UCSD), At University of Arizona, Neuroscience Seminar Series Talk: "The Fruit Fly and the B.R.A.I.N. Initiative.", Tucson, AZ, September 2015.

Invited speaker: U of A Psychology Dept. Undergraduate Honors Seminar. Title: "Research and Research Opportunities in the Cowen Laboratory." Tucson, AZ, September 15, 2015.

Invited speaker: U of A Medical School: Medical School Residents Journal Club. Title: "Ketamine and neural oscillations." Tucson AZ, September 7, 2015.

Invited consultant: Science and Entertainment Exchange (National Academy of Sciences). Consultation on hemineglect for a writer/producer developing a film script. Oct. 2015.

Invited speaker: UC Davis. Title: "The Influence of Aging on the Variability of Neuronal Activity", Davis CA, May 8, 2015.

Invited speaker: McKnight Brain Institute Meeting. Title: "The Influence of Aging on the Variability of Neuronal Activity", Miami FL, May 1, 2015.

Invited speaker: Undergraduate Neuroscience Association, Title: "The Circuitry of Choice: Roles of neural activity and neuromodulation in decision making", Tucson AZ, March 23, 2015.

Invited speaker: Quantitative Biology Colloquium, University of Arizona, Title: "Ripples, Neurons, and Aging", Tucson, AZ, February 3, 2015.

Invited speaker: Graduate Interdisciplinary DataBlitz, University of Arizona, Title: "Effort, Reward, and Dopamine", Tucson, AZ, January 26, 2015.

Invited speaker: NAWBO Women's Business Wellness Workshop, "Move it or lose it: How our bodies empower our brains", Tucson, AZ January 12, 2014.

Invited speaker: Workshop on the Computational Properties of the Prefrontal Cortex "Effort and the Anterior Cingulate", Whistler, BC (Canada), Sept 2014.

Invited speaker: Rising Stars in Neuroscience lecture,
Evelyn F. McKnight Brain Institute, "Neural System, Networks, and the Impact of Aging", Gainesville, Florida, April. 24, 2014.

Faculty host: For **Doug Nitz, Ph.D**., University of Arizona, CNS Seminar Series Talk: "Cell Assemblies of the Basal Forebrain", Tucson, AZ, February 2014.

Invited speaker: University of Arizona Evelyn F. McKnight Brain Institute Scientific Program, Title: "The Impact of Aging on Physiology and Function of the Prefrontal Cortex", Tucson, AZ, Oct. 23, 2013.

Invited speaker for the Neural Circuits of Adaptive Control workshop, Title: "The Measurement and Meaning of Effort Guided Behavior", Paris, France, Sept. 28 2013.

Invited speaker at the COSYNE computational neuroscience conference. "Beyond the cost of work: Relationships between physical effort, risk, and reward." Salt Lake City, UT, March 1, 2013.

Invited speaker: University of Arizona Neuroscience DataBlitz "Action and Effort in the Anterior Cingulate Cortex", Tucson AZ, Aug 28 2012.

Invited speaker: **Decision Making in Rodents and Primates Conference,** "Actions first, outcomes second: Sensorimotor and outcome processing in the dmPFC", Heidelberg, Germany, Sept. 28, 2012.

Invited speaker: Inter-departmental University of Arizona seminars including the Cognitive Science Brown Bag, Neuroscience Seminar Series, and Neurology Journal Club, Biochemistry Journal Club, Tucson, AZ, 2012.

Invited speaker: "What is computational neuroscience", Frances Parker High School, San Diego, CA, May 2011.

Invited speaker: Title: "Embodied Cognition" for the Casa de Mañana retirement community, the Minding the Brain Symposium, May 2010, San Diego, CA.

Consultant for the Science and Entertainment Exchange (National Academy of Sciences) 2010, Los Angeles, CA.

Talks by others on collaborative work performed:

Phelps, C. Learning and Memory Conference. "Chronic pain impairs cognitive flexibility and engages novel learning strategies in rats" (UC Irvine) Huntington Beach, CA April 2018.

Spanò, G., Gomez, R., Demara, B., **Cowen, S.L.,** and Edgin J.O. To Nap or Not to Nap?: Sleep-dependent Memory Consolidation in Typically and Atypically Developing Preschoolers. World Sleep, Prague, October 2017.

Spanò, G., Gomez, R., Demara, B., **Cowen, S.L.,** and Edgin J.O. To Nap or Not to Nap?: Sleep-dependent Memory Consolidation in Typically and Atypically Developing Preschoolers. Sleep: A joint meeting of the American academy of sleep medicine and the sleep research society, Boston, MA. 2017.

Spanò, G., Gomez, R., Demara, B., **Cowen, S.L.**, and Edgin J.O. Memory Consolidation across Naps in Typical Development and in Preschoolers with Down Syndrome. The 2017 SRCD Biennial Meeting in Austin, TXs, April 2017.

Spanò, G., Gomez, R., Demara, B., **Cowen, S.L.**, and Edgin J.O. Memory Consolidation across Polysomnography-assessed Naps in Preschoolers with Down Syndrome. The 50th Annual Gatlinburg Conference, in San Antonio, TX, March 2017.

Juried conference abstracts, student talks, and poster presentations:

Dorsal hippocampal neurons differentially respond to dimensions of time and length during a fine-motor behavior (Nov. 2025) Holguin G, Huestis Z, White A, Surtchev Y, Jorgensen K, Tapia A, Barnes CA, **Cowen SL**. Society for Neuroscience Abstracts. San Diego CA.

Increased mPFC-ivHC theta synchrony during correct task choice observed in young but not in old rats (Nov. 2025) Sterzinar C, Srivathsa S, Sponseller M, Garza V, Church E, Warrier M, **Cowen SL**, Barnes CA. Society for Neuroscience Abstracts. San Diego CA.

Aged rats show reduced evoked medial PFC response to ventral hippocampus stimulation (Nov. 2025) Srivathsa S, Vishwanath A, Garza V, **Cowen SL**, Barnes CA. Society for Neuroscience Abstracts. San Diego CA.

Old rats continue to switch between allocentric and procedural strategies throughout spatial learning (Nov. 2025) Sponseller M, Srivathsa S, **Cowen SL**, Barnes CA. Society for Neuroscience Abstracts. San Diego CA.

Investigating the proportion of task-related cell ensembles in the rat hippocampus using unsupervised ensemble detection (Nov. 2025) Arthur D, Schimanski L, **Cowen SL**, Barnes CA, Tatsuno M. Society for Neuroscience Abstracts. San Diego CA.

Novel treadmill escape learning task for assessing interval timing in the TgF344-AD rat model of Alzheimer's Disease (Nov. 2025) Dougherty R, Mazurik G, Lovato I, **Cowen SL**. Society for Neuroscience Abstracts. San Diego CA.

An acute L-DOPA injection partially reverses string-pulling deficits in a rat model of Parkinson's disease (Nov. 2025) Caprau R, Aristieta A, Schmit M, Malik A, White A, Pederson V, **Cowen SL**, Falk, T. Society for Neuroscience Abstracts. San Diego CA.

Opposing responses of hippocampal theta oscillations to running and a forelimb-dominated sensorimotor behavior (2025) Holguin G, Jorgensen K, Tapia A, Jordan G, Vishwanath A, Barnes CA, **Cowen SL**. Society for Neuroscience Abstracts. San Diego CA.

Disruption of sleep architecture and sleep-state transition dynamics during opioid dependence (Nov. 2025) Patel S, Dougherty R, Johnstone T, QU C, Vizin R, Ito H, Navratilova E, **Cowen SL**, Porreca F. Society for Neuroscience Abstracts. San Diego CA.

Reduction of L-DOPA-induced dyskinesia by optogenetic inhibition of PV interneurons in motor cortex (Nov. 2025) Falk T, Aristieta A, **Cowen SL**. Society for Neuroscience Abstracts. San Diego CA.

Novel treadmill escape learning task for assessing interval timing in the TgF344-AD rat model of Alzheimer's Disease (2025) Mazurik G, Dougherty R, Lovato I, Cowen SL. Arizona Alzheimer's Consortium Scientific Conference, Phoenix AZ.

Novel treadmill escape learning task for assessing interval timing in the TgF344-AD rat model of Alzheimer's Disease (2025) Dougherty R, Mazurik G, Lovato I, Cowen SL. Society for Neuroscience Conference, San Diego CA.

M. Duc Hoang, Andrea R. Hamilton, Timothy J. Lewis, **Stephen L. Cowen**, and M. Leandro Heien (July 5- 9th, 2025) Poster presentation. Baseline Firing Rate of Dopaminergic Neurons Modulates the Dopamine Response to Stimuli (34th Annual Meeting of Computational Neuroscience, Florence, Italy)

M. Duc Hoang, Andrea R. Hamilton, Timothy J. Lewis, **Stephen L. Cowen**, and M. Leandro Heien (July 24-27, 2025) Poster presentation. Baseline Firing Rate of Dopaminergic Neurons Modulates the Dopamine Response to Stimuli (48th Annual Meeting of the Japanese Society for Neuroscience, Niigata, Japan)

Introducing variability into the inter-pulse interval of electrical brain stimulation in the MFB and mPFC alters dopaminergic release (2024) A. Hamilton, A. Vishwanath, N. Weintraub, **S. L. Cowen**, M. L. Heien. Society for Neuroscience Conference, San Diego CA..

Dorsal hippocampal single-unit responses to time, length of string pulled, and trial condition during a novel fine-motor string-pulling behavior (2024) G. Holguin, K. Jorgensen, A. Tapia, Z. Huestis, S. H. Marean, K. Boone, C. A. Barnes, **S. L. Cowen**. Society for Neuroscience Abstracts.

Investigating age-related changes of mPFC neural responses to ventral hippocampus stimulation (2024) *S. Srivathsa, A. Vishwanath, **S. L. Cowen**, C. A. Barnes. Society for Neuroscience Abstracts.

Effect of Estrogen and Progesterone Loss on Neurogenesis-related Spatial Learning and Search Strategies in Aging Female Rats (2024) G. M. Winter, M. J. Corenblum, S. Pillutla, J. R. Meredith, P. Wene, N. Menakuru, **Cowen S.L.**, L. Madhavan. Society for Neuroscience Abstracts.

Chinnaraj K., Vishwanath A., Bartlett M.J., Falk T., **Cowen S.L** (2024). In a rodent model of L-DOPA-induced dyskinesia, coupling between primary motor cortex local-field and single-unit activity to movement is suppressed, and this coupling is not restored by low-dose ketamine. Society for Neuroscience Abstracts.

Vishwanath A, Hamilton AR, Weintraub NC, Stopera CJ, Winter GM, Serna MF, Heien ML, **Cowen SL** (2023) Differential effects of medial forebrain bundle stimulation on distinct neural subpopulations and dopamine release in the nucleus accumbens. Society for Neuroscience Abstracts, Washington DC. November 10-15.

Vishwanath A, Bartlett MJ, Keener A, Falk T, **Cowen SL** (2023) In a hemi-lesioned model of L-DOPA-induced dyskinesia neuronal firing was reduced in the un-lesioned striatum and ketamine reduced burst-like firing in striatal neurons bilaterally. Society for Neuroscience Abstracts. Washington DC. November 10-15.

Holguin G, Tapia AK, Jorgensen K, Jordan G, Vishwanath A, Miron SA, Vigil EC, Webster AL, **Cowen SL** (2023) Modulation of hippocampal theta power and phase during a bimanual string-pulling behavior. Society for Neuroscience Abstracts. Washington DC. November 10-15.

Weintraub NC, Hamilton A, Vishwanath A, Holguin G, **Cowen SL**, Heien, ML. (2023) The effects of variability in the timing of electrical brain stimulation pulse sequences on the dynamics of dopamine. Society for Neuroscience. Washington DC. November 10-15.

Dominguez BR, Holguin G, Bjork R, **Cowen SL,** Miller JE. (2023) Alpha-synuclein overexpression in the basal ganglia vocal nucleus, Area X, alters waveform patterns in a zebra finch model of Parkinsonian vocal deficits. Society for Neuroscience. Washington DC. November 10-15.

Stopera CJ, Bartlett MJ, **Cowen SL**, Sherman SJ, Falk T (2023); Pravastatin sensitizes parkinsonian rats to L-DOPA and blocks the long-term anti-dyskinetic activity of subanesthetic ketamine. Society for Neuroscience Abstracts. Washington DC. November 10-15.

Srivathsa S, Vishwanath A, Church ER, **Cowen SL**, Barnes CA (2023) Investigating age-related changes of mPFC neural responses to ventral hippocampus stimulation. Society for Neuroscience Abstracts. Washington DC, November 10-15.

Hamilton AR, Vishwanath A, Weintraub NC, Winter GM, Lin KK, Lewis TJ, **Cowen SL**, Heien ML (2023) The effects of variability in the timing of electric brain stimulation pulse sequences on dopamine release and single-unit activity in the nucleus accumbens. BRAIN Initiative Conference: Bethesda MD. June 11., 2023

A Vishwanath, MJ Bartlett, JL Kwidzinski, M Kaminski, T Falk, **SL Cowen**. Phase-locking of motor cortex neurons to ketamine-generated slow gamma oscillations and 80-Hz gamma

oscillations in parkinsonian rats with L-DOPA-induced dyskinesias: Society for Neuroscience Meeting, San Diego, CA, November 2022.

Falk T, Bartlett MJ, Richards SS, Lind A, Stopera C, Liu C, **Cowen SL**, Steece-Collier K, Heien ML, Hsu CP, Sherman SJ; Repurposing of sub-anesthetic ketamine to treat LDOPA-induced dyskinesia – Results from preclinical models and an open-label Phase I/II clinical trial. Society for Neuroscience Abstracts, 2022.

S Srivathsa, A Vishwanath, **SL Cowen**, CA Barnes. Investigating age-related changes of mPFC neural responses to ventral hippocampus stimulation: Society for Neuroscience Meeting, San Diego, CA, November 2022.

Falk T, Bartlett MJ, Stopera C, Vishwanath A, Liu C, Heien ML, **Cowen SL**, Sherman SJ. Update on preclinical and clinical evidence in support of repurposing sub-anesthetic ketamine as a treatment for L-DOPA-induced dyskinesia. 7th Annual ABRC-Flinn Research Conference, Phoenix, AZ, 2022.

NC Weintraub, AR Hamilton, A Vishwanath, G Holguin, **SL Cowen,** M Heien. The effect of inter-pulse variability in electrical deep-brain stimulation on the time course of evoked dopamine release, San Diego, CA, November 2022.

Vishwanath A, Bartlett MJ, Falk T, **Cowen SL**; Ketamine disrupts 80-Hz gamma oscillations and reduces burst firing in naïve and parkinsonian rats with levodopa-induced dyskinesia. 16th International Conference on Alzheimer's and Parkinson's Diseases and related neurological disorders, AD/PD™ Abstracts, 2022.

AR Hamilton, A Vishwanath, NC Weintraub, GR Holguin, **SL Cowen**, ML Heien. The effects of variability in the timing of electrical brain stimulation pulse sequences on the dynamics of dopamine, BRAIN Initiative Presentation May 20, 2022 (virtual).

Falk T, Bartlett MJ, Ye T, Stopera C, Liu C, Heien ML, **Cowen SL**, Sherman SJ. Update on preclinical and clinical evidence in support of repurposing sub-anesthetic ketamine as a treatment for L-DOPA-induced dyskinesia. 6th Annual ABRC-Flinn Research Conference, Phoenix, AZ, 2021.

Bartlett MJ, Stopera C, Sexauer MR, Vishwanath A, Jordan G, **Cowen SL**, Falk T The string-pulling task as a novel and simple behavior to test for parkinsonian deficits in unilaterally 6-OHDA-lesioned rodents. Society for Neuroscience Meeting: Global Connectome, Jan. 11-13 2021.

Vishwanath A, Bartlett MJ, Jordan G, Boudreau V, Sherman SJ, Falk T, **Cowen SL** Ketamine disrupts 80-Hz gamma oscillations in parkinsonian rats with L-DOPA-induced dyskinesia. Society for Neuroscience Meeting: Global Connectome, Jan. 11-13 2021.

Crown L, Gray DT, Schimanski LA, Barnes CA, **Cowen SL** Decreased dynamic range of hippocampal CA1 gamma in aged rats. Society for Neuroscience Meeting: Global Connectome, Jan. 11-13 2021.

Falk T, Bartlett MJ, Ye T, Farrell DC, Heien ML, Steece-Collier K, **Cowen SL**, Sherman SJ. Preclinical evidence in support of repurposing sub-anesthetic ketamine as a

treatment for L-DOPA-induced dyskinesia. European Neuroscience Virtual Forum Abstracts, 2020.

Falk T, Bartlett MJ, Ye T, Farrell DC, Heien ML, **Cowen SL**, Sherman SJ. Preclinical and clinical evidence in support of repurposing sub-anesthetic ketamine as a treatment for L-DOPA-induced dyskinesia. 5th Annual ABRC-Flinn Research Conference, Phoenix, AZ, 2020.

Seaton BT, Hill DF, **Cowen SL**. Heien ML, Mitigating the effects of electrode biofouling for improved long-term measurement of dopaminergic signaling. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Martin AB, Andersen KR, Morrow JK, Hillier EA, Cardenas S, Lee S, **Cowen SL**. Gothard KM, From discriminative to affective touch: A mesoscale perspective of the somatosensory pathway to the primate amygdala. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Hill DF, Olson Z, Bartlett MJ, Falk T, Heien ML, **Cowen SL.** Simultaneous measurement of ventral tegmental area activity and nucleus accumbens dopamine release reveals patterns of neuron firing associated with dopamine release. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Crown L, Gray DT, Schimanski LA, Barnes CA, **Cowen SL.** Spatial eye-blink learning but not age predicts theta-gamma coupling in the CA1 region of the hippocampus. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Monroe EJ, Crown LM, Bartlett MJ, Wiegand J-P, Eby AJ, Falk T, **Cowen SL.** Increased sleep spindle density in LRRK2 G2019S mice. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Wilhite C, Alvarez A, Burton A, Preston C, Mustacich D, Fuglevand A, Gothard K, **Cowen SL**, Witte RS**.** *In vivo* swine model for developing and validating acoustoelectric brain imaging: Towards noninvasive, real-time 4D electrical brain mapping. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Ye T, Bartlett MJ, Sexauer M, Sherman SJ, Falk T, **Cowen SL.** Oscillatory signatures of L-DOPA-induced dyskinesia are dependent on the LID induction protocol and L-DOPA dose. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Wilhite CA, Witte RS, **Cowen SL.** Activation of hippocampal CA2 region precedes CA3 following perforant-path stimulation and spontaneously occurring dentate spikes. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Falk T, Ye T, Bartlett MJ, Sherman SJ, **Cowen SL.** Region-dependent cross-frequency interactions in a preclinical model of L-DOPA-induced dyskinesia after low-dose ketamine. Chicago, IL: Society for Neuroscience Meeting, November 2019.

Falk T, Bartlett MJ, Heien ML, Ye T, **Cowen SL**, Steece-Collier K, Sherman SJ; Mechanisms underlying the anti-dyskinetic effect of sub-anesthetic ketamine. 39th Blankenese Conference: Signaling in Health and Disease, Hamburg, Germany, 2019.

Hill DF, Olson Z. **Cowen SL**. Pharmacologically induced transient dopamine release is not correlated with increased VTA dopamine cell activity, ARCS Foundation Scholar Conference Phoenix, AZ April, 2018. (Dan was awarded the prestigious ARCS scholarship).

Hill DF, Olsen Z, Heien ML, **Cowen SL**. Encoding of phasic nucleus accumbens dopamine release by ventral tegmental area neurons revealed through simultaneous single-unit recording and fast-scan cyclic voltammetry. Washington, DC: Society for Neuroscience Meeting, November 2018.

Crown L, Wohlford L, Bartlett MJ, Wiegand JP, Eby AJ, Monroe E, Gies K, Falk T, **Cowen SL**. Six-month-old LRRK2 G2019S knock-in mice do not express motor learning deficits on the rotarod task. Washington, DC: Society for Neuroscience Meeting, November 2018.

Wilhite CA, Witte RS, **Cowen SL**. Peak activation of the CA2 subregion of the hippocampus precedes peak activation of CA3 following perforant-path stimulation. Washington, DC: Society for Neuroscience Meeting, November 2018.

Ye T, Bartlett MJ, Falk T, **Cowen SL**. L-DOPA-induced striatal gamma oscillations split into low- and high-frequency components following ketamine exposure in an animal model of L-DOPA-induced dyskinesia. Washington, DC: Society for Neuroscience Meeting, November 2018.

Cowen SL, *Hill DF, Heien M. Integrated measurement of dopamine release and neural ensemble activity, Brain Initiative Conference, Bethesda, MD, April, 2018. (Dan Hill presented the poster.)

Wilhite C, Burton A., Hill DF, Bera T, Ingram P, **Cowen SL**., Witte RS. Acoustoelectric brain imaging in anesthetized rats: towards noninvasive, real-time 4D electrical brain. Brain Initiative Conference, Bethesda, MD, April, 2018.

Wilhite C, Burton A., Hill DF, Bera T, Ingram P, **Cowen SL**., Witte RS. Acoustoelectric brain imaging: preliminary results in anesthetized rats. UA COM Founder's Day Junior Investigator Poster Forum, Tucson AZ, November 2017.

Wiegand, J, Gies, K, Bartlett, M, Falk, T, **Cowen, SL** Altered sleep physiology in a LRRK2 mouse model in Parkinson's Disease. Program No. P299.07. Washington, DC: Society for Neuroscience, November 2017.

Crown, L, Nitz, D, **Cowen, SL** Local-field potential activity in the medial prefrontal cortex does not respond to anticipation of effort or reward. Society for Neuroscience Annual Meeting 2017, Washington, DC, November 2017

Ye T, Bartlett MJ, Falk T, **Cowen, SL**. Oscillatory Signatures of L-DOPA-induced Dyskinesia Are Not Reduced by Ketamine. Society for Neuroscience Annual Meeting, Washington DC, November 2017.

Richard C, Crown L, Wiegand J-PL, Bartlett M, Falk, T, Heien M, **Cowen SL**. Altered Sleep Spindles in a LRRK2 Mouse Model of Parkinson's Disease. UROC Minority Health Disparities Summer Research Program Poster Session, Tucson AZ, August 2017

Parent, KL; Bartlett, MJ; Crown, LM; Gies, KF; Miller, MA; Falk, T; **Cowen, SL;** Heien, ML "Longitudinal studies of tonic dopamine for investigation of neural disorders" Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy March 8, 2017, Chicago, IL

Schmit M, Ye T, Bartlett M, Falk T, **Cowen SL**. Directional propagation of ketamine-induced high-frequency oscillations between the striatum, hippocampus, and motor cortex. Program No. 302.25. Society for Neuroscience, 2016.

Wiegand, J-PL, Gies, K, Bartlett, M, Falk, T, **Cowen, SL** Increased power of sleep spindle oscillations in the LRRK2 mouse model of Parkinson's disease. Program No. P06.22. Portland, OR: World Parkinson Congress 2016.

Ye T, Bartlett MJ, Schmit M, Sherman SJ, Falk T, **Cowen SL** (2016). Gamma-band oscillatory activity in the motor cortex is progressively enhanced following repeated ketamine administration in 6-OHDA-lesioned rats. Portland, OR: World Parkinson Congress 2016.

Parent, K.L.; Bartlett, M.J.; Crown, L.M.; Gies, K.F.; Miller, M.A.; Falk, T.; **Cowen, S.L.;** Heien, M.L. "Real-time measurement of ketamine-induced tonic dopamine fluctuations in freely- moving rats" Monitoring Molecules in Neuroscience June 1, 2016, Gothenburg, SWE

Parent, K.L.; Hill, D.F.; Wiegand, J.P.; Miller, M.A.; Atcherley, C.W.; **Cowen, S.L.**; Heien, M.L. "Simultaneous detection of dopamine release and neural activity" Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy March 7, 2016, Atlanta, GA

Gray, D., Wiegand, J., Schimanksi, L., **Cowen, S**., Barnes, C. Age-related reduction in signal-to-noise ratio of sharp-wave ripple oscillations following behavior in aged rats. San Diego, CA: The Evelyn F. McKnight Brain Institute 2016.

Gray, D., Wiegand, J., Schimanksi, L., **Cowen**, **S.L.**, Barnes, C. Age-related reduction in signal-to-noise ratio of sharp-wave ripple oscillations following behavior in aged rats. Program No. 182.11. Society for Neuroscience, 2016.

Wiegand, J., Gray, D., Schimanski, L., Lipa P., Barnes, C., **Cowen S.L**. Age-Related Changes in Theta-Delta Ratio Measures of Slow-Wave Sleep. Tucson, AZ: The Science of Consciousness, 2016.

Falk T, Bartlett MJ, Ye T, Lazarus LB, Heien ML, **Cowen SL**, Sherman SJ. Preclinical evaluation of sub-anesthetic ketamine infusion to reduce L-DOPA-induced dyskinesias: is it a 'chemical' DBS? Movement Disorders Society Abstracts, 2016.

Gray, D., Wiegand, J., Schimanksi, L., **Cowen, S.L**., Barnes, C. Age-related reduction in signal-to-noise ratio of sharp-wave ripple oscillations following behavior in aged rats. San Diego, CA: The Evelyn F. McKnight Brain Institute 2016.

Wiegand, J., Gies, K., Bartlett, M., Falk, T. , **Cowen, S.L.** Stronger cortical spindles and less power variability in hippocampal ripples in a LRRK2 mouse model of Parkinson's disease. Program No. 699.07. Society for Neuroscience, 2016.

Wiegand, J., Gray, D., Schimanksi, L., Lipa, P., Barnes, C., **Cowen, S.L**. Time-dependent decrease in the peak frequency and power of hippocampal sharp-wave ripples and high-gamma events during post-behavior sleep in aged and young rats. Program No. 179.06. Chicago, IL: Society for Neuroscience, 2015.

Heien, M., Parent K., Hill D., Wiegand, J., Miller M., Atcherley C., **Cowen S.L.** Simultaneous detection of dopamine release and neural activity. Program No. 266.08. Chicago, IL: Society for Neuroscience, 2015.

Ye, T., Bartlett, M., Wiegand, J., Schmit M., Sherman S., Falk, T., **Cowen S.L.** Modulation of high-frequency oscillations and beta coherence in striato-cortico-limbic circuits following repeated sub-anesthetic ketamine exposure. Program No. 479.09. Chicago, IL: Society for Neuroscience, 2015.

Wiegand, J., Gray, D., Schimanksi, L., Lipa P., Barnes C., **Cowen S.L**. Age-related changes in high-frequency local field activity in the rodent hippocampus during ripple and inter-ripple periods. Phoenix, AZ: Arizona Alzheimer's Consortium 2015.

Hill, D., Heien, M., Parent K., **Cowen S.L** Simultaneous detection of dopamine release and neural activity. Mayo Clinic BRAIN Initiative conference, Rochester MN. 2015

Heien, M., Parent K., Hill D., Wiegand, J., Miller M., Atcherley C., **Cowen S.L**. Simultaneous detection of dopamine release and neural activity. New Orleans, LA: PITTCON 2015.

Parent, K.L.; Hill, D.F.; Wiegand, J.P.; Miller, M.A.; Atcherley, C.W.; **Cowen, S.L.**; Heien, M.L. "Simultaneous detection of dopamine release and neural activity" Society for Neuroscience October 18, 2015, Chicago, IL

Miller, M.**, Cowen, S.L.:** "Non-linear optical imaging". Arizona Alzheimer's Research Consortium, Phoenix, AZ. 2015.

Miller, M., Mehravar, S., Gray, D., Koshy, A., Cabral, C., Chawla, M., Kieu, K., Barnes, C., **Cowen, S**., Peyghambarian, N. Non-linear optical imaging: A powerful new technique for acquiring high-resolution brain images and possible application for identifying cell types and neuronal activity. Program No. 560.05. Washington, DC: Society for Neuroscience, 2014.

Hill, D., Miller M., Atcherley, C., Heien, M., Parent, K., Rauscher, M., Ye, T., **Cowen, S.** Prefrontal regulation of phasic dopamine release in the nucleus accumbens.Program No. 362.16. Washington, DC: Society for Neuroscience, 2014.

Wiegand, J., Gray, D., Schimanksi, L., Lipa P., Barnes C., **Cowen S.L**. Age-related changes in high-frequency local field activity in the rodent hippocampus during ripple and inter-ripple periods. Program No. 560.03. Washington, DC: Society for Neuroscience, 2014.

Cowen S.L., Wiegand, J., Gray, D., Schimanski, L., Lipa P., Barnes, C. Age-associated changes in spike-timing of hippocampal principal cells and interneurons during ripple oscillations. Program No. 560.04. Washington, DC: Society for Neuroscience, 2014.

Parent, K.L.; Hill, D.F.; Miller, M.A.; Atcherley, C.W.; Rauscher, M.; Ye, T; **Cowen, S.L.**; Heien, M.L. "Changes in phasic dopamine signaling in the nucleus accumbens and

dorsomedial striatum through electrical stimulation of the medial prefrontal cortex" Monitoring Molecules in Neuroscience August 3-7, 2014, Los Angeles, CA.

Invited Oral Presentation by Mentored Graduate Students:

Feb 21, 2024: Abhilasha Vishwanath: to Winter Conference on Neural Plasticity (WCNP). Title: "Levodopa induced dyskinesia induced brain rhythms and the impact of ketamine", Puerto Vallarta, Mexico.

July 16, 2019: Lindsey Crown: Speaker at the University of California, San Diego "Sleep, Parkinson's disease and the G2019S LRRK2 mutation. ", San Diego, CA.

January 23, 2018: Lindsey Crown: Speaker at the University of Arizona Neuroscience Recruitment Data Blitz Title: "Local Field Potential Oscillations in the Anterior Cingulate Cortex and their Relationship to Effort-based Decision-Making", Tucson AZ.

October 31, 2017: Jean-Paul Wiegand: Speaker at the Neurocolloquium: "Altered sleep physiology in a LRRK2 mouse model in Parkinson's Disease", Tucson AZ.

October 30, 2017: Tony Ye: Speaker at the Cognition & Neural Systems (CNS) Seminar. Title: "Oscillatory Signatures of L-DOPA-induced Dyskinesia Are Not Reduced by Ketamine", Tucson AZ.

August 2017: Daniel Hill: Dissecting ventral tegmental area control of dopamine release. UA Physiological Science Departmental Forum Presentation, Tucson, AZ.

October 2017: Cameron Wilhite: Speaker at UA Physiology Student Forum. Title: "Electrophysiological mapping of the perforant path input to the hippocampus; Towards validation of acoustoelectric brain imaging," Tucson, AZ.

September 15th, 2017: Zach Olson: Speaker at forum presentation to the Department of Physiology University of Arizona. Title: "Simultaneous recording of ventral tegmental area single-unit activity and nucleus accumbens dopamine release" Tucson, AZ.

December 4, 2017: Lindsey Crown: Psychology Department CNS Seminar Presentation Title: "Investigating local field potential activity in the rat anterior cingulate cortex during effort- and reward-based decision-making", Tucson AZ.

November 22, 2016: Jean-Paul Wiegand: Speaker at the Neurocolloquium: "Altered sleep physiology in a LRRK2 mouse model in Parkinson's Disease", Tucson AZ.

April 29, 2016: Jean Paul Wiegand: Speaker at the Science of Consciousness Conference "Age-Related Changes in Theta-Delta Ratio Measures of Slow-Wave Sleep", Tucson AZ.

April 29, 2016: Lindsey Crown: Speaker at the Science of Consciousness Conference "Ketamine Injection Acutely and Rapidly Decreases Tonic Dopamine Levels in the Rat Dorsal Striatum", Tucson, AZ.

Spring 2015: Jean Paul Wiegand: Formal Presentation to the Arizona Alzheimer's Research Consortium, Phoenix, AZ.

January 27 2015: Jean-Paul Wiegand: Speaker at the Neuroscience Data Blitz: "Age-related changes in hippocampal ripple dynamics", Tucson AZ.

Poster Presentations and Abstracts Presented at the University of Arizona

Summers, AJ, White, T, Hill, D, Siegenthaler, J, Heien,M., **Cowen, SL.** A Comparison of Conductive Adhesives for Chronically Implantable Carbon-Fiber Microelectrodes. UA Undergraduate Biology Research Program Poster Session January 2018.

Wohlford, L, Crown, L, Parent, K., Bartlett, M., Falk,T, Heien,M., **Cowen, SL.** Fast-Scan Controlled Adsorption Voltammetry as a Method to Measure Absolute Levels of Dopamine In Vivo. UA Undergraduate Biology Research Program Poster Session January 2017.

Seghezzo G, Ye T, Hill DF, Bartlett MJ, Sherman SJ, Falk T, **Cowen SL**. Effects of ketamine on single-unit activity in the dorsolateral striatum and hippocampus. 27th Annual Undergraduate Biology Research Program Conference. 2016

Davis BC, Ye T, **Cowen, SL**. Investigating the relationship between high-frequency oscillations and neuronal spiking due to sub-anesthetic ketamine in a rodent model for dyskinesia. Neuroscience and Cognitive Science Undergraduate Summer Poster Session 2016.

Parent, K.L.; Hill, D.F.; Wiegand, J.P.; Miller, M.A.; Atcherley, C.W.; **Cowen, S.L.**; Heien, M.L. "Multimodal measurements of neural networks and chemical communication" Chemistry and Biochemistry Research Symposium, August 10, 2016, Tucson, AZ.

Parent, K.L.; Hill, D.F.; Crown, L.M.; Gies, K.F.; Wiegand, J.P.; Miller, M.A.; Atcherley, C.W.; **Cowen, S.L.;** Heien, M.L. "Developing instrumentation to expand neuroscience" Biological Chemistry Program-Drug Discovery and Delivery Retreat November 13, 2015, Tucson, AZ

Parent, K.L.; Hill, D.F.; Crown, L.M.; Gies, K.F.; Wiegand, J.P.; Miller, M.A.; Atcherley, C.W.; **Cowen, S.L.**; Heien, M.L. "Developing instrumentation to expand neuroscience" Chemistry and Biochemistry Research Symposium, August 13, 2015, Tucson, AZ

Petersen L, **Cowen S.L** Three neural pathways to encode two types of decision cost. Honors poster session. 2014.

Lazar, M, Miller M., **Cowen S.L**., How ACC neurons behave during delay tasks and affect motor movement. Freshman honors poster session. 2013

Miller M., **Cowen S.L**., Neural mechanisms of cost-benefit decision making. Science in the City and Tech Launch Arizona technology showcase. 2013

AWARDED GRANTS AND CONTRACTS

Note: I am on 9-month salary. Consequently, the percent effort indicates percent of a year in addition to the 9-month salary period.
Abbreviations: %Cred = percent credit; %FTE = percent full time employment; TOT = total amount of award, IND = total indirect awarded, DIR = total direct awarded.

R25 NIH/NINDS (R25NS138018) Neuroscience Diversity to Elevate Education and Research Development. (Co-I (16 other Co-Is), PI: Kathleen Rogers) ***8/01/24 - 7/31/29***

Objective: Provide mentoring opportunities for students.
ID(24030952): %Cred: 0; %FTE 0; TOT: $1,337,340; IND: $99,180; DIR: $1,239,745

R25 NIH/NIA (R25AG086126) Diversity in Research Education in Aging Medicine and Science (Co-I (18 other Co-Is), PI: Kathleen Rogers) ***4/15/24 - 03/31/29***

Objective: Provide mentoring opportunities for students.
ID(53796): %Cred: 0; %FTE 0; TOT: $1,885,436; IND: $139,661; DIR: $1,745,775

Arizona Alzheimer's Consortium Match Projects: Characterizing the TgF344-AD rat model of Alzheimer's Disease through novel histopathological markers, high-resolution diffusion MRI variables, and their relation to cognitive performance. (PI, Co-Is: Carol Barnes (Psych), Beth Hutchinson (BME)) ***7/1/26 - 6/30/27***

Objective: Our broad goal is to measure histological and MRI variables associated with AD in tgF344AD animals and relate these variables to behavioral measures of cognition.
%Cred: 33 ;%FTE 0: ;TOT: $58,128 ;IND: $0 ;DIR: $58,128

Arizona Alzheimer's Consortium Match Projects: Determining the impact of Alzheimer's disease and kappa-opioid receptor signaling on sleep fragmentation, sharp-wave ripple oscillations, and memory-trace reactivation (Role: Co-I, PI: Frank Porreca, Edita Navratilova, Mitch Bartlett, Russell Dougherty) ***7/1/26 - 6/30/27***

Objective: Determine if blockade of the kappa opioid receptor can reduce sleep fragmentation and improve sleep physiology in a rat Alzheimer's model.
%Cred: 33 ;%FTE 0: ;TOT: $29,108 ;IND: $0 ;DIR: $29,108

Arizona Alzheimer's Consortium Match Projects: Direct comparison of high density recording devices for optimizing isolation of the largest numbers of hippocampus neurons (Role: Co-I, PI: Carol Barnes) ***7/1/25 - 6/30/26***

Objective: To compare hippocampus cell yield performance of tetrode versus Neuropixels 2.0 recording probes, to motivate the method we will use for an upcoming R01 competitive renewal grant. ($28,947)
%Cred:50; %FTE:0;TOT: $28,947;IND: $0;DIR: $28,947

Arizona Alzheimer's Consortium Match Projects: Advanced dMRI applications to detect microscale pathology and glymphatic-lymphatic pathophysiology in the TgF344-AD rat model (Role: Co-PI, PI: Elizabeth Hutchinson) ***7/1/25 - 6/30/26***

Objective: Promising diffusion MRI (dMRI) techniques for microstructure and cerebrospinal fluid (CSF) fluid dynamics have been developed at UA. We will apply these promising approaches to detect glymphatic-lymphatic disruption in the TgF344-AD rat strain.
%Cred: 33 ;%FTE:0: ;TOT: $30,000 ;IND: $0 ;DIR: $30,000

Arizona Alzheimer's Consortium Match Projects: Determining the impact of Alzheimer's disease on the capacity of acetylcholine to reorganize hippocampal neural ensembles in response to novelty and motion. (Role: PI, Co-I: Carol Barnes, Asier Aristieta)
7/1/25 - 6/30/26

Objective: Determine if the release of acetylcholine, a neurochemical involved in learning and memory, is disrupted in a rat model of Alzheimer's disease and if such disruption impacts coordination between individual neurons.
%Cred:33; %FTE:0; TOT:$30,000; IND:$0; DIR:$30,000

U01 NIBIB (U01EB029834) 4D Transcranial Acoustoelectric Imaging for High Resolution Functional Mapping of Neuronal Currents (Role: Co-I, PI: Russel Witte, other Co-Is: Jennifer Becker, Nan-kuei Chen, Ying-Hui Chou, Katalin Gothard, Willard Kasoff, Leonid Kunyansky, Martin Weinand) 9/30/2020-*6/30/26*

Objective: Develop and validate a non-invasive imaging system for measuring electrical currents deep in the brain using ultrasound and the acoustoelectric effect.
%Cred:4; %FTE:4; TOT: $3,608,394; IND: $862,470; DIR:$2,745,924

P30 NIH-NIDA (P30DA051355 ID(41986)) The Center of Excellence in Addiction Studies (CEAS) (Role: Co-PI and Pilot Core Lead, PI: Frank Porreca, Co-Is: Todd Vanderah, Yeon Sun Lee, Edita Navrratilova, Michael Heien, Tally Milnes, Art Riegel) 8/15/2021-05/31/26

Objective: Develop core facilities at the UA to support research at the intersection of addiction and pain management. My role is to develop a Pilot Core that encourages de-novo research and ultimately leads to NIDA R01 applications. (my Pilot budget: total: $614,274).
%Cred:8.34; %FTE:8.34; TOT: $7,667,187; IND: $2,665,306; DIR:$5,001,881

R01 NIH-NIA (RF1AG081767) Frontal and Temporal Lobe Interactions in Rat Models of Normative Aging and Alzheimer's Disease (Role: Co-I, PI: Carol Barnes) 5/15/21-4/30/26

Objective: Determine if neural interactions between the frontal cortex and hippocampus are impaired in a transgenic rat model of Alzheimer's disease.
%Cred:50;%FTE:50;TOT: $2,166,421;IND:$729,250;DIR:$1,437,171

R01 NIH-NINDS (5R01NS123424) Control of the Time Course of Dopamine Release Through Optimized Electrical Brain Stimulation (Role: PI: This is a MPI with Michel L. Heien and Timothy Lewis) 9/15/21-8/31/26

Objective: Determine if neural interactions between the frontal cortex and hippocampus are impaired in a transgenic rat model of Alzheimer's disease.
%Cred:33;%FTE:33;TOT: $1,833,908 ;IND:$513,494;DIR:$1,320,414

Arizona Alzheimer's Consortium Match Projects (022713): Coordination between dopamine release, sharp-wave ripple oscillations, and neural ensemble activity during sleep in a transgenic rodent model of Alzheimer's disease. (Role: PI) *7/1/24 - 6/30/25*

Objective: 1) Determine if the timing of dopamine release in the nucleus accumbens and neural activity during hippocampal sharp-wave ripple oscillations is disrupted in the TgF344-AD model of Alzheimer's disease. 2) Establish a TgF344-AD colony at UA
%Cred:100;%FTE:0;TOT: $33,000;IND:$0;DIR:$33,000

R01 NIH-NINDS (R01NS122805) Mechanisms of Low-Dose Ketamine Treatment for Parkinson's Disease (Role: Co-I: PI: Torsten Falk) 7/1/21-6/30/25

Objective: Identify the mechanisms underlying the capacity of ketamine to reduce dyskinesias.

%Cred:33;%FTE:33;TOT: $1,495,839;IND:$401,241;DIR:$1,094,598

R43 NIH (OD034043-01A1 SBIR1) An Automated System for Post-surgical Health and Environmental Monitoring with Real-time Alerts for Laboratory Rodents Using Scalable Hardware and Deep Learning (Role: Co-I, PI: Paul Gibson, Applied Universal Dynamics) ***6/1/23 - 4/30/25***

Objective: Develop a within-cage monitoring system to track the health of laboratory animals following surgical procedures.
%Cred:100;%FTE:100;TOT: $83,378; IND:$26,908;DIR:$56,470

R21 NIH (1R21NS123512): Alpha-Synuclein Driven Cellular Changes and Vocal Dysfunction in Parkinson's Disease (Role: Co-I, PI: Julie E. Miller) ***7/01/21 - 6/30/23***

Objective: Characterize the genetic and electrical brain activity driving the early parkinsonian vocal deficits in an animal model.
%Cred:6.25;%FTE:6.25;TOT: $415,482; IND:$140,482; DIR:$ 275,000

Arizona Alzheimer's Consortium Match Projects: Assessing hippocampal-prefrontal communication during memory guided and sensorimotor behaviors using a transgenic rodent model of Alzheimer's disease. (Role: Co-PI, PI: Lee Ryan) ***8/1/23 - 8/31/24***

Objective: Determine if neural communication between the hippocampus and prefrontal cortex is disrupted in a novel rat model of Alzheimer's disease using high-density neural recording methodologies.
%Cred:3;%FTE:3;TOT: $30,990; IND:$0; DIR:$30,990

(internal) Center for Excellence in Addiction and Pain Research Pilot grant (Role: PI): The effects of opioid use and chronic pain on the physiology of sleep and neural circuits involved in pain and addiction. ***8/15/22 - 8/14/23***

Objective: Determine if sleep-associated oscillatory activity is impacted by chronic pain and opioid receptor agonism and antagonism. ($30,000, equipment and student support).
%Cred:100;%FTE:100;TOT: $30,000; IND:$0; DIR: $30,000

Arizona Alzheimer's Consortium Match Projects (Proposal No: TBD): Investigation of age-associated changes in neural coordination in behaving animals (Role: Co-I, PI: Lee Ryan) ***8/1/22 - 7/31/23***

Objective: Test and advance Neuropixels technology for 1000+ site recording in awake and behaving rats to study age-associated cognitive changes. ($31,000).
%Cred:3;%FTE:3;TOT: $31,000; IND:$0; DIR: $31,000

(internal) U. of Arizona Psychology Faculty Pilot Grant Award: Wireless transcranial optogenetic stimulation for the interrogation of neural circuits involved in memory formation (Role: PI) ***6/1/21 - 5/31/22***

Objective: Develop technologies for transcranial stimulation of neurons in rodents through skull-mounted LED and optogenetics. ($10,000, equipment and student support only).
%Cred:100;%FTE:100;TOT: $10,000; IND:$0; DIR: $10,000

Arizona Alzheimer's Consortium Match Projects (Proposal No: 45978): Investigation of age-associated changes in neural coordination and plasticity using advanced high-density neural-ensemble recording technologies (Role: Co-I, PI: Lee Ryan) ***8/1/21 - 7/31/22***

Objective: Advance large-scale neural recording for the study of cognitive decline in aging through application of 1000-site neural recording technologies.
%Cred:3;%FTE:3;TOT: $29,000; IND:$0; DIR: $29,000

R44 NIH (44MH11477603): High Density, Miniaturized, Zero Switching, Stimulation and Recording Headstage for Small Animals (Role: PI as sub to AME) ***7/01/21 - 6/30/23***

Objective: Develop novel brain stimulation system that does not interfere with the measurement of neural activity. SBIR-type grant with industry.
%Cred:100;%FTE:100;TOT: $79,433; IND:$19,433; DIR:$ 60,000.

U01 NIH (1U01EB02866): 4D Transcranial Acoustoelectric Imaging for High Resolution Functional Mapping of Neuronal Currents (Role: Co-I, PI: Russ Witte, 5 other Co-Is) ***09/30/19 - 09/21/21***

Objective: Develop methodologies for non-invasive imaging of electrical activity in the brain using ultrasound and the acoustoelectric effect.
%Cred:3;%FTE:3;TOT: $428,307; IND:$124,882; DIR:$303,425.

R25 NIH NINDS (R56NS109608): Mechanisms of low-dose ketamine treatment for Parkinson's disease (Role: Co-I, PI: Torsten Falk, Co-Is: Michael Heien, Helena Morrison, Kristian Doyle) ***7/01/21 - 6/30/25***

Objective: Identify the circuit and single-neuron properties that drive Parkinson's disease associated oscillations and determine how ketamine works to reduce pathology associated oscillatory activity. (0.27 academic and 2 summer months), $1,861,435 total).
%Cred:30;%FTE:30;TOT: $1,861,435; IND: $506,810; DIR:$ 1,354,625.

R24 NIH (5R24MH109060): High Resolution Electrical Brain Mapping by Real-Time and Portable 4D Acoustoelectric Imaging (Role: Co-I, PI: Russ Witte, 6 other Co-Is) ***9/25/15- 03/31/20***

Objective: Develop methodologies for non-invasive imaging of electrical activity in the brain using ultrasound and the acoustoelectric effect.
%Cred:8;%FTE:8;TOT: $1,302,734; IND: $402,734; DIR:$ 900,000.

Japan Society for the Promotion of Science (JSPS) Invitational Fellowship. (Role: Funded Researcher) **7/1/2021- 11/1/2021**
*****Had to cancel after award due to COVID travel restrictions preventing travel to Japan**

Objective: Sabbatical research in Japan (Okinawa Institute for Science and Technology) to determine how sequences of neural activity in the hippocampus underlies the formation of memories. (¥2,475,600 = ~$23,000)
%Cred:100;%FTE:100;TOT: $23,000; IND: $0; DIR: $23,000.

Michael J Fox Foundation (11014.01): Identification of network, oscillatory and behavioral signatures of the LRRK2 expression (Role: PI) ***5/01/17 - 07/31/19***

Objective: Identify neural biomarkers that distinguish the LRRK2 genetic form of Parkinson's disease from healthy controls and idiopathic Parkinson's disease.
%Cred:90;%FTE:90; TOT: $249,999; IND: $49,999; DIR: $199,999

R01 NIH-NINDS (5R01NS084026): Restoring Functional Connectivity Following TBI (Role: PI, subcontract from UC Davis/Gurkoff) ***2/15/14-01/31/19***

Objective: Develop new ways to use electrical deep brain stimulation for the precise control of tonic (slow) and phasic (fast) dopamine release in the brain. Disrupted tonic and phasic dopamine release underlies addiction, depression, Parkinson's disease. (0.45 academic and 2 summer months).
%Cred:100;%FTE:100; TOT: $120,219; IND: $79,352; DIR: $40,866

PENDING:

R01 NIH NINDS: Mechanisms of low-dose ketamine treatment for Parkinson's disease (Role: PI (MPI grant))

Objective: Expand the understanding of the development of dyskinesia in PD and the mechanisms underlying novel treatments.

NIH SBIR Phase 2 for: "An automated system for post-surgical health and environmental monitoring with real-time alerts for laboratory rodents using scalable hardware and deep learning" (Role: Co-I, PI: Paul Gibson, Applied Universal Dynamics)

Objective: Develop novel technologies for the automatic detection of health issues for rodents recovering from surgical procedures.

R01 NIH NINDS: Uncovering Early Parkinson's Mechanisms Via A-Synuclein Driven Vocal Dysfunction (Co-I, PI: Julie Miller)

Objective: Identify circuit-level dysfunction in a zebra finch animal model of Parkinson's disease.

PAST:

U01 NIH (1U01EB028662-01): 4D Transcranial Acoustoelectric Imaging for High Resolution Functional Mapping of Neuronal Currents (Role: Co-investigator, PI: Russ Witte) ***09/30/19 - 06/30/20***

Objective: Develop methodologies for non-invasive imaging of electrical activity in the brain using ultrasound and the acoustoelectric effect. ($428,307)

R44 NIH (1R44MH114776-01, 4029010): High density, miniaturized, zero switching, stimulation and recording headstage for small animals (Role: Co-investigator, PI: Daniel S Hedin) (Phase 2 awarded from previously funded proposal) ***8/01/19 - 2/28/21***

Objective: Develop new technologies for simultaneously stimulating and recording brain activity. (5% effort (0.52 SM), $224,957 total.).

R56 NIH (NS109608): Mechanisms of low-dose ketamine treatment for Parkinson's disease (Role: Co-investigator, PI: Torsten Falk) ***8/01/19 - 8/1/20***

Objective: Identify the circuit and single-neuron properties that drive Parkinson's disease associated oscillations and determine how ketamine works to reduce pathology associated oscillatory activity. (0.27 academic and 2 summer months), $ 372,287).

R44 NIMH (R44MH114776): High density, miniaturized, zero switching, stimulation and recording headstage for small animals (Role: Co-investigator, PI: Daniel S Hedin)
8/01/17 - 1/31/18

Objective: Develop new technologies for simultaneously stimulating and recording brain activity. (5% effort (0.52 SM), $224,957 total.). Phase 2 support is pending.

R24 NIMH (MH106108-01): High-resolution electrical brain mapping by real-time and portable 4D acoustoelectric imaging (Role: Co-investigator, PI: Russel Witte)
10/01/15 - 9/31/18

Objective: Develop new technologies for acoustoelectric imaging of brain activity. (7% effort, $900,000 total.)

NSF BRAIN-EAGER (DBI-1450767): Integrated measurement of dopamine release and large-scale ensemble activity in behaving animals (Role: PI) ***09/01/14 - 08/31/17***

Objective: Develop novel technology for the simultaneous recording of the activities of individual neurons and dopamine release in freely behaving animals. (8.33% effort, $300,000 total, 1 summer mo.)

NIH R01 (NS084026-01A1): Restoring functional connectivity following TBI
(Co-investigator, PI: Gene Gurkoff) ***06/01/14 - 09/01/18***

Objective: Assist investigation of functional connectivity changes associative traumatic brain injury and following deep-brain stimulation therapy. Support for travel to assist with inter-region LFP surgical procedures and recording. (8.3% effort $121,039, 1 summer mo.)

Intra-institutional Grants:

U. Arizona Accelerate for Success Grant: From Pathophysiology to Therapeutics in Childhood Epilepsy: A translational approach using an SCN8A mouse model and human induced pluripotent stem cells
(Co-investigator, PI: Michael Hammer) ***07/01/17 - 07/31/18***

Objective: Identify mechanisms underlying SCN8A epilepsy. My role: collect and analyze video and EEG data in mutant mice expressing the mutant SCN8A gene. (Total Grant: $99,164)

U. Arizona Improving Health TRIF Grant: Building capacity for inferring facial communication from video data
(Co-investigator, PI: Jacobus Bernard) ***07/01/17 - 07/31/18***

Objective: Develop algorithms to infer emotion and neuromodulator levels from video and eyeblink tracking data in humans, non-human primates, and rodents. My role: assess eye blink rates associated with emotional state in rodents. (Total Grant: $88,677)

Foundation Grants and Fellowships:

***Japan Society for the Promotion of Science (JSPS) Invitational Fellowship. (Role: Funded Researcher) 07/1/2021- 11/1/2021. (Had to cancel due to COVID travel restrictions)**

Objective: Sabbatical research in Japan (Okinawa Institute for Science and Technology) to determine how sequences of neural activity in the hippocampus underlies the formation of memories. (¥2,475,600 = ~$23,000)

Michael J Fox Foundation (11014.01): Identification of network, oscillatory and behavioral signatures of the LRRK2 expression (Role: PI) ***05/01/17 - 04/31/19***

Objective: Identify neural biomarkers that distinguish the LRRK2 genetic form of Parkinson's disease from healthy controls and idiopathic Parkinson's disease. (8% effort $200,000)

LuMind Foundation: Brain development, sleep and learning in Down syndrome (Role: Co-Investigator, PI: Jaime Edgin) ***1/01/17-8/31/18***

Objective: Identify neural signatures of sleep dysfunction in Down-syndrome subjects (EEG). (Total $250,000, 6.2% effort)

Michael J Fox Foundation (11014): Identification of network and oscillatory signatures of the LRRK2 mutation (Role: PI) ***08/01/15 - 07/31/16***

Objective: Identify neural biomarkers that distinguish the LRRK2 genetic form of Parkinson's disease from healthy controls and idiopathic Parkinson's disease. (11% effort, $124,929)

Evelyn F. McKnight Brain Research Foundation (Role: PI) ***08/01/12- 08/01/20***

Objective: To investigate how high-order integration centers such as the frontal cortex and hippocampus change as a function of normal aging. One effect of age may be in the strength and fidelity interactions between neurons and brain regions. Large-scale ensemble recording allows the direct investigation of this issue in behaving animals. ($125,000 to startup)

G Harold and Leila Y. Mathers Charitable Foundation (Co-PI) 12/01/08 - 12/01/11

My Role: As a co-investigator, I performed ensemble-recording experiments that investigated how associations between reward, effort, and actions are stored in the frontal cortex and how these associations change when contingencies reverse. My work also informed the work of other investigators on this grant who study the rules of associative learning in cortical slices and in anesthetized animals. ($300,000)

The San Diego Foundation: Blasker-Rose-Miah Award (PI) 07/01/10 - 06/30/11

My Role: I was the principal investigator on this grant and performed multi-unit recordings in the anterior cingulate and orbitofrontal cortex of rats as they completed decision-making behaviors. ($50,000)

SAMPLE OF SUBMITTED GRANTS (LAST 3 YEARS):

NIH R25 (R25AG092294) Teacher Teams Enhancing AD/ADRD Diverse Mentorship/Research Education in Arizona (TEAMAz) (Role: MPI, PI: Marlys Witte) 04/01/2025 - 03/31/2030

NIH R01 (1R01NS136226) Uncovering Early Parkinson's Mechanisms Via A-Synuclein Driven Vocal Dysfunction. (Role: Co-Investigator, PI: Julie Miller) 12/01/2024 - 11/30/2029

2021: 2 SBIR grants for new neurotechnology. 1 ERC Neural Engineering grant for pain and addiction. NIH R21 (NS125373-01) for Transcranial Optogenetics.

LIST OF COLLABORATORS AND THEIR ORGANIZATIONAL AFFILIATIONS (5 YR)

** indicates currently active collaborations.*

*Carol A. Barnes, University of Arizona, Tucson AZ
*Mitchell J. Bartlett, University of Arizona, Tucson AZ
Ying-hui Chou, University of Arizona, Tucson AZ
Lindsey Crown, Neurocrine, San Diego CA
Arne Ekstrom, University of Arizona, Tucson AZ
*David Euston, Lethbridge, Canada
*Torsten Falk, University of Arizona, Tucson AZ
Gene Gurkoff, UC Davis, Davis CA
Philipp Gutruf, University of Arizona, Tucson AZ
*M. Leandro Heien, University of Arizona, Tucson AZ
*Gabriel Holguin, The Scripps Research Institute, San Diego, CA
*Elizabeth Hutchinson, University of Arizona, Tucson AZ
*Timothy Lewis, University of California, Davis, CA
*Timothy Johnstone, University of Arizona, Tucson AZ
*Lalitha Madhavan, University of Arizona, Tucson AZ
*Julie Miller, University of Arizona, Tucson AZ
*Edita Navratilova, University of Arizona, Tucson AZ
*Frank Porreca, University of Arizona, Tucson AZ
Arthur C. Riegel, University of Arizona, Tucson AZ
*Scott J. Sherman, University of Arizona, Tucson AZ
Masami Tatsuno, Lethbridge, Canada
*Abhilasha Vishwanath, University of Arizona, Tucson AZ
*Russell Witte, University of Arizona, Tucson AZ
Tony Ye, Lundbeck Pharma, Copenhagen Denmark

GRADUATE, POSTDOCTORAL, THESIS ADVISORS, OR SPONSORS

Bruce McNaughton, the University of California, Irvine (Graduate)
Doug Nitz, the University of California, San Diego (Postdoctoral)

TEACHING

Fall 2026: Cognitive Neuroscience (PSY 300)

Spring 2026: Co-Lecturer (2.5 weeks) Systems Neuroscience (Grad level NRSC 560)

Spring 2026: Drugs, Cognition, and the Brain (PSY 413, 180 students)

Fall 2025: Co-Instructor Cellular and Molecular Neuroscience (NRSC 588 2 weeks)

Spring 2025: Drugs, Cognition, and the Brain (PSY 313, 200 students)

Spring 2025: Co-Lecturer (2.5 weeks) Systems Neuroscience (Grad level NRSC 560)

Fall 2024: Co-Instructor NRSC 588 Cellular and Molecular Neuroscience (2.5 weeks)

Summer 2024: Invited instructor for the 2-week intensive course in neurobiology hosted at the Massachusetts Marine Biological Laboratories at Woods Hole.

Spring 2024: Advanced Drugs, Cognition, and the Brain (PSY 413, >150 students)

Spring 2024: Brain Waves – neural oscillations course (PSY 310)

Spring 2024: Co-Lecturer (2.5 weeks) Systems Neuroscience (Grad level NRSC 560)

Fall 2023: I designed a new course: Brain Waves – neural oscillations course (PSY 310)

Summer 2023: Invited instructor for the 2-week intensive course in neurobiology hosted at the Massachusetts Marine Biological Laboratories at Woods Hole.

Spring 2023: Drugs, Cognition, and the Brain (PSY 313, >200 students)

Spring 2023: Co-Lecturer (2.5 weeks) Systems Neuroscience (NRSC 560)

Spring 2022: Co-Lecturer (2.5 weeks) Systems Neuroscience (Grad level NRSC 560)

Spring 2022: Advanced Drugs, Cognition, and the Brain (PSY 413, >150 students)

Fall 2022: Neural Coding and Memory (PSY 506) (co-teach)

Fall 2022: Graduate Statistics Fundamentals using R (PSY 510)

Fall 2021: Advanced Drugs, Cognition, and the Brain (PSY 413)

Fall 2021: Graduate Statistics Fundamentals using R (PSY 510)

Fall 2020 - Spring 2021: Sabbatical

Spring 2020: Drugs, Cognition, and the Brain (PSY 313, 213 students)

Spring 2020: Co-Lecturer (2.5 weeks) Systems Neuroscience (NRSC 560)

Fall 2019: Graduate Statistics Fundamentals using R (PSY 510)

Fall 2019: Graduate-level Drugs and the Brain (PSY 513)

Spring 2019: Neural Coding and Memory (PSY 506)

Spring 2019: Co-Lecturer (2.5 weeks) Systems Neuroscience (NRSC 560)

Spring 2019: Drugs, Cognition, and the Brain (PSY 313)

Fall 2018: Graduate Statistics using R (PSY 510)

Spring 2018: Guest lecture Neuroanatomy: Limbic system (PSY 502)

Spring 2018: Co-Lecturer (2.5 weeks) Systems Neuroscience (NRSC 560)

Spring 2018: Drugs, Cognition, and the Brain (PSY 313)

Spring 2018: Statistics (PSY 230)

Fall 2017: Graduate Statistics Using R (PSY 510) University of Arizona

Spring 2017: Guest lecture (4 lectures on learning and memory systems) Systems Neuroscience (NRSC 560a)

Spring 2017: Neural Coding and Memory (PSY 506a)

Fall 2016: Graduate Statistics using R (PSY 510)

Spring 2016: Guest lecture/speaker for the Neuroscience and Cognitive Science (NSCS) club.

Spring 2016: Guest lecture (3 lectures on learning and memory systems) Systems Neuroscience (NRSC 560a)

Spring 2016: Drugs, Cognition, and the Brain (PSY 313)

Fall 2015: Statistics (PSY 230)

Fall 2015: Honors research class presentation (PSY 396H)

Fall 2015: Brain and Cognition (PSY 402)

Spring 2015: Guest lecture "The anatomy of the basal ganglia. (PSY 502: Principles of Neuroanatomy)

Spring 2015: Guest lecture (3 lectures on learning and memory systems) Systems Neuroscience (NRSC 560a)

Spring 2015: Neural Mechanisms of Decision Making (PSY/NRSC 596)

Fall 2014: Statistics (PSY 230)

Fall 2014: Brain and Cognition (PSY 402)

Fall 2014: Honors research class presentation (PSY 396H)

Spring 2014: Neural Coding and Memory (PSY 506a)

Spring 2014: Guest lecture (3 lectures on learning and memory systems) Systems Neuroscience (NRSC 560a)

Spring 2014: Guest lecture (Hippocampus and space) Systems Neuroscience (NSCS 315)

Fall 2013: Statistics (PSY 230)

Fall 2013: Brain and Cognition (PSY 402)

Fall 2014: Honors research class presentation (PSY 396H)

Spring 2013: Neural Mechanisms of Decision Making (PSY/NRSC 596e)

ADVISING AND MENTORING

Member: Since 2019, I have served on the masters or doctoral committee for **32** graduate students and advised **39** undergraduate research assistants and honor's students. I have been the primary advisor of a total of **6** PhD students and **6** masters students.

Dissertation, Prelim, and Master's committees (as of 2022): Abhilasha Vishwanath (Psychology), Wesley Schnapp (Neuroscience), Matt Schmit (Neuroscience), Gowri Somasekhar (Neuroscience), Vani Pillutla (Neuroscience), Kelsey McDermott (Neuroscience), Marc Zempare (Neuroscience), Yilin Liu (Psychology), David Negelspach (Psychology), Sarah Seger (Neuroscience), **Gianna Jordan (Applied Biosciences, BME), Rajashree Ramamoorthy (BME), Gabe Holguin (Psychology)**.

External Member (2021): Dissertation committee (U Alberta, Lethbridge)

External Member (2020): Dissertation committee (U Alberta, Lethbridge)

External Member (2018): Dissertation committee for Katelynn Ondek (UC Davis)

Dissertation and Master's committee (2018): 9 graduate students, chair of committee for 2 students.

Dissertation and Master's committee (2017): 8 graduate students, chair of committee for 2 students.

Dissertation committee (2016): 7 graduate students, chair of committee for 1 student.

Honors Thesis adviser (2016-present): 3 students.

Dissertation committee (2015): 2 graduate students.

Dissertation committee (2014): 2 graduate students.

Graduate adviser (2014 - present): 4 students.

Graduate adviser (2013): 3 students.

Honors Thesis adviser (2013-present): Undergraduate thesis.

Demonstrator and Instructor (2013): Tucson Book Festival neuroscience booth. Spikerbox electrophysiology demonstration.

Thesis adviser (2012-2017): Master's thesis advisor for 4 students (Physiological Sciences and Neuroscience Departments).

Mentor: (2012-present): >50 Undergraduate and 7 High School student research assistants.

Thesis adviser (2010): Undergraduate thesis advisor for student at Whitman College.