Phillip M. Baker, PhD

Assistant Professor, Department of Psychology, Seattle Pacific University,

(206) 685-3763 (office), bakerp5@spu.edu

Education

2008-2013 Ph.D. in Neuroscience, University of Illinois at Chicago, Advisor: Michael E. Ragozzino.
Thesis Title – Prefrontal Cortex-Basal Ganglia Contributions to Proactive Behavioral Switching

2003-2007 B.A. in Biochemistry, Minor in Philosophy, Eastern Mennonite University, Harrisonburg, VA

Research Experience

2013-2018 Postdoc, University of Washington Department of Psychology, PI: Sheri J.Y. Mizumori

2013 Postdoc, University of Illinois at Chicago Department of Psychology, PI: James E. McCutcheon

2008-2013 Graduate Research, University of Illinois at Chicago Department of Psychology, PI: Michael E. Ragozzino

2006-2007 Undergraduate Research, Eastern Mennonite University Biochemistry Department, PI: Stephen Cessna

Teaching Experience/Topics of Interest

Topics of interest: Comparative Neuroanatomy, Physiology and Behavior, Neurobiology, History of Neuroscience, Neural Basis of Motivation, Systems Neuroscience, Psychopharmacology.

2018 - Present Assistant Professor at Seattle Pacific University. Taught:
PSY 3388 Brain and Behavior Exploration
PSY 4488 Behavioral Neuroscience
PSY 4110 Psychopharmacology
PSY 2210 Health Psychology

2017 Instructor for NBIO 403 Systems and Behavioral Neurobiology, University of Washington

2016 Lectured in PSYCH 426 Neurobiology of Learning and Memory, University of Washington

2105 Guest lectures NBIO 403 Systems and Behavioral Neurobiology. Topic – Neural basis of cognitive flexibility, University of Washington

2013 Co-Instructor, University of Illinois at Chicago, BIOS 386 Advanced Topics in Modern Neuroscience

2009-2013 Teaching Assistant, University of Illinois at Chicago Department of Psychology
2009, 2010 PSCH 351 Neural Basis of Perception
2010, 2011 PSCH 363 Laboratory in Behavioral Neuroscience
2011 PSCH 100 Introduction to Psychology (discussion section instructor)

Research Interests

I am interested in the neural circuitry that underlies decision-making in both health and disease. Specifically I seek to understand how the brain uses multiple systems including the frontal cortex, basal ganglia, habenula, and midbrain monoamines to integrate environmental cues and reward feedback to

guide decisions. Using animal models offers unique opportunities to examine how critical brain areas and neurotransmitters involved in decision-making respond *in vivo* to a constantly changing external environment. My long term goal is to leverage my training and research experience to inspire students to utilize the tools they have learned from science to engage societal problems in their unique context.

Student Mentoring

2018 – Present Seattle Pacific University, Principal Investigator

Project: *The contribution of the lateral habenula to effort based and aversive-appetitive decision making*. This project uses pharmacological inactivation of the lateral habenula to determine whether this crucial neural interface between the forebrain and midbrain/hindbrain contributes to choices for aversive/high value options and high value high effort choices to inform dopamine and serotonin centers about updating values.

2013-2018 University of Washington, Undergraduate Research Mentor, Mizumori Laboratory

Jesse Miles – *Examination of closed loop perturbations of neural synchrony during experience dependent navigation* (currently in PhD program at University of Washington)

Kevan Kidder – Honors thesis project: *Control of monoamine systems via the lateral habenula during cognitive flexibility* (published, currently in PhD program at University of Washington)

Summer Raynor – Honors thesis project: *Proactive switching and the lateral habenula* (published)

Nikita Francis – Contributed to several ongoing research projects (published, currently in PhD program at SUNY Stony Brook)

Heather Wessel – Honors thesis project: *Control of serotonin signaling by the lateral habenula*

Esteli Garcia – Contributed to several projects (Currently a laboratory technician in UW Biochemistry)

Lauren Tetsuko Hall, Sarahi Ponton Junes – Contributed to several projects.

2011-2013 C2A Tutor for low income students, Chicago Public Schools

2009-2013 University of Illinois at Chicago, Undergraduate Research Mentor, Ragozzino Laboratory

Gena Grospe – Project Title: *Impairments in Cognitive Flexibility in a Rat Model of Parkinson's Disease* (Published. Currently in Medical Residency)

Anam Syed- Honors thesis project: *Contributions of the Pedunculopontine Tegmental Nucleus to Cognitive Flexibility* (Published, Currently in Medical Residency)

Daniel Aiello- Project Title: *The Role of the Indirect Pathway in Proactive Switching* (Graduated from PhD program at UC Davis)

2006-2007 Eastern Mennonite University, Tutor of Chemistry, Biology, and English

Fellowships/Support

2017-2019 NIH-NIMH R21 "Closed loop analysis of hippocampus-prefrontal cortex during flexible navigation." Role: Investigator. Budget $190,864 (annual)

2013-2015 NIH-NIDA University of Washington Center for Drug Addiction Research, Molecular Basis of Drug Abuse Fellowship, T32 DA07278-20 Stipend: $52,158 (annual)

2015 International Brain Research Organization World Congress Travel Award from the Society for Neuroscience. Stipend: $3,000

2011-2013 Center for Clinical and Translational Research, Pre-doctoral Education for Clinical and Translational Scientists Fellowship, TL1 UL1TR000050 Stipend: $47,225 (annual)

Publications

2018 *Gena M. Grospe*, **Phillip M. Baker**, Michael E. Ragozzino. Cognitive flexibility deficits following 6-OHDA lesions of the rat dorsomedial striatum. Neuroscience 374, 80-90.

2017 **Phillip M. Baker** and Sheri J.Y. Mizumori. Control of behavioral flexibility by the lateral habenula. Pharmacology, Biochemistry and Behavior 162:62-68.

2017 Sheri J.Y. Mizumori and **Phillip M. Baker**. The Lateral Habenula and Adaptive Behaviors. Trends in Neuroscience 40(8):481-493.

2017 **Phillip M. Baker**, *Summer A. Raynor*, *Nikita T. Francis*, and Sheri J. Y. Mizumori. Lateral habenula integration of proactive and retroactive information mediates behavioral flexibility. Neuroscience 345, 89-98.

2016 **Phillip M. Baker**, Thomas Jhou, Bo Li, Masayuki Matsumoto, Sheri Mizomuri, Marcus Stephenson-Jones, Aleksandra Vicentic. The lateral Habenula circuitry: reward processing and cognitive control. Journal of Neuroscience 36 (45), 11482-11488.

2016 *Anam Syed*, **Phillip M. Baker**, Michael E. Ragozzino. Lesions of the Pedunculopontine Tegmental Nucleus Impair Probabilistic Reversal Learning. Neurobiol Learn Mem. 131:1-8. doi: 10.1016/j.nlm.2016.03.010.

2015 **Phillip M. Baker**, Sujean E. Oh, *Kevan S. Kidder*, and Sheri J.Y. Mizumori. Ongoing behavioral state information signaled in the lateral habenula guides choice flexibility in freely moving rats. Front. Behav. Neurosci. 9:295. doi: 10.3389/fnbeh.2015.00295

2015 Elena H. Chartoff, Stephanie R. Ebner, Angela Sparrow, David Potter, **Phillip M. Baker**, Michael E. Ragozzino, Mitchell F. Roitman. Relative timing between kappa opioid receptor activation and cocaine determines the impact on reward and dopamine release. Neuropsychopharm. 2015 Aug 4. doi: 10.1038/npp.2015.226

2014 **Phillip M. Baker**, Michael E. Ragozzino. Contralateral disconnection of the rat prelimbic cortex and dorsomedial striatum impairs cue-guided behavioral switching. Learning and Memory. 2014 Jul 15;21(8):368-79.

2014 Srivani Borra, Elizabeth A McCullagh, David E Featherstone, **Phillip M. Baker**, Michael E Ragozzino, Scott A Shippy. Determining striatal extracellular glutamate levels in xCT mutant mice using LFPS CE-LIF. Analytical Methods. 2014 Mar; 6 (9), 2916-2922.

2014 **Phillip M. Baker**, Michael E. Ragozzino. The prelimbic cortex and subthalamic nucleus contribute to cue-guided behavioral switching. Neurobiol Learn Mem. 2014 Jan;107:65-78.

2012 Eric G. Mohler, **Phillip M. Baker**, Sharon Shacham, Kimberly Gannon, John A. Sweeney & Michael E. Ragozzino. PRX-07034, A Novel 5-HT6 Antagonist Enhances Cognitive Flexibility and Working Memory. Psychopharm (Berl). 2012 Apr; 220:687-96.

2011 **Phillip M. Baker**, Jennifer L. Thompson, John A. Sweeney & Michael E. Ragozzino. Differential Effects of 5-HT2A and 5-HT2C Blockade on Strategy-Switching. Behav Brain Res. 2011 May 16; 219: 123-131.

2010 Holden D. Brown, **Phillip M. Baker**, Michael E. Ragozzino. The parafascicular thalamic nucleus concomitantly influences behavioral flexibility and dorsomedial striatal acetylcholine output in rats. J Neurosci. 2010 Oct 27;30(43):14390-8.

Book Chapters

2016 Michael E. Ragozzino, **Phillip M. Baker**. Frontal Cortex- Basal Ganglia Systems Support of Learning and Memory Functions. The Neurobiological Basis of Memory: A System, Attribute, and Process Analysis. Subtitle: A Festschrift in Honor of Raymond P. Kesner. Springer: New York.

Publications in Preparation

Phillip M. Baker, Sheri J.Y. Mizumori, Effects of chronic cocaine experience on delay discounting and medial prefrontal-dorsomedial striatal circuitry. [In Preparation]

** Italics represent undergraduate mentee

Invited Addresses

2018 **Phillip M. Baker**. California State University at San Bernadino Pychology Seminar Series. Title: "Determining causal relationships between neural signaling and behavioral flexibility outcomes."

2017 **Phillip M. Baker**. Winter Conference on Brain Research. Symposium title, "Information Integration: Novel Roles for the Lateral Habenula in Behavioral Control."

2016 **Phillip M. Baker,** Sheri J. Y. Mizumori. Society for Neuroscience annual meeting, Symposium title, "The Lateral Habenula Circuitry: Reward Processing and Cognitive Control."

2015 **Phillip M. Baker***, Summer A. Raynor*, Sheri J.Y. Mizumori. Lateral habenula inactivation impairs cued switching performance in rats. Nanosymposium on Basal Ganglia and Basal Forebrain: Behavioral Control. Chair: Catharine Winstanley. Society for Neuroscience annual meeting.

2015 **Phillip M. Baker**. Midbrain-striatal neurocircuitry encodes context-dependent reward, movement, and spatial information. IBRO World Congress 2015. Minisyposium on the role of the basal ganglia in action-selection. Chair: Donita Robinson. International Brain Research Organization

Presentations/Abstracts

2017 **Phillip M. Baker**, *Esteli M. Garcia*, *Brittany K. Leung*, & Sheri J.Y. Mizumori Lateral habenula inactivation impairs delayed alternation performance but not working memory in rats. Society for Neuroscience Annual Meeting (abstract)

2015 **Phillip M. Baker**, Sheri JY Mizumori, Chronic cocaine exposure disrupts delay related neural activity in the mPFC during temporal discounting. Park City Winter Conference on the Neurobiology of Learning and Memory (data blitz)

2014 **Phillip M. Baker**, Sheri JY Mizumori. Effects of cocaine on prefrontal - striatal neural activity during maze-based delay discounting. Society for Neuroscience Annual Meeting (abstract)

2013 **Phillip M. Baker**, *Anam Syed*, Michael E. Ragozzino. The Pedunculopontine Tegmental Nucleus Contributions to Early Cognitive Deficits in Parkinson's Disease. Society for Neuroscience Annual Meeting. (abstract)

2013 Church EC, Rivero-Covelo I, Braun DJ, Fettiplace MR, Cone JJ, **Baker, PM**, Alpert, MH. Lessons learned in the development of a primary literature-based undergraduate neuroscience course. Society for Neuroscience Annual Meeting. (Theme H abstract)

2013 **Phillip M. Baker**, *Anam Syed*, Michael E. Ragozzino. The Pedunculopontine Tegmental Nucleus Contributions to Early Cognitive Deficits in Parkinson's Disease. Center for Clinical and Translational Science Annual Pre-doctoral Meeting. (abstract)

2012 **Phillip M. Baker**, Michael E. Ragozzino. Contributions of the Prelimbic Cortex and Dorsomedial Striatum During a Conditional Discrimination in Rats. Society for Neuroscience Annual Meeting. (abstract)

2012 **Phillip M. Baker**, *Gena Grospe*, Michael E. Ragozzino. Impairments in Cognitive Flexibility in a Rat Model of Parkinson's Disease. Center for Clinical and Translational Science Annual Pre-doctoral Meeting. (abstract)

2011 **Phillip M. Baker**, Michael E. Ragozzino. Differential Contributions of the Prelimbic Cortex, Subthalamic Nucleus, and Disconnection of the Circuit During a Conditional Discrimination in Rats. Society for Neuroscience Annual Meeting. (abstract)

2010 **Baker PM**, Thompson JM, Sweeney JA, Ragozzino ME. Differential effects of 5HT-2A and 5HT-2C blockade on attentional set shifting. Chicago Chapter of the Society for Neuroscience. (abstract)

2009 **Baker PM**, Brown HD, Ragozzino ME. Parafascicular thalamic nucleus inactivation simultaneously modifies dorsomedial striatal acetylcholine output and place reversal learning. Society for Neuroscience Annual Meeting. (abstract)

2007 **PM Baker**, SG Cessna. Copper-sensing GFP reporter yeast: an analytical method for soil copper determination. The FASEB Journal 21 (5), A723-A724 (abstract)

Academic Awards/Honors

2017 Finalist for postdoctoral mentor of the year, University of Washington

2007 Graduated with honors, Eastern Mennonite University

2003-2007 Presidents Scholarship Award, Eastern Mennonite University

2003-2007 Dean's List, Eastern Mennonite University

2003-2007 NCAA Division III Old Dominion Athletic Conference All-Academic Team Award in Men's Soccer, Eastern Mennonite University

2003 Salutatorian, Western Mennonite High School, Salem, OR

Service/Administrative

2015-Present	Ad hoc reviewer for the Journals Neuroscience and Brain Research Bulletin
2014-Present	Review Editor for Frontiers in Behavioral Neuroscience Journal
2014-Present	Volunteer at Bethany Community Church Community Meal
2016-2018	Contributor to Office of Postdoctoral Affairs content and planning
2015-2018	Postdoctoral representative to the University of Washington Research Advisory Board
2014-2018	Member of the Neuroscience Community Outreach Group at the University of Washington
2013	Co-Coordinator for Chicago Brain Awareness Day and Brain Bee
2011-2013	Tutor for C2A Program for Chicago Public School students
2011, 2012	Graduate Assistant for Chicago Brain Awareness Day and Brain Bee
2010-2013	Graduate Student Council Representative, University of Illinois at Chicago
2009-2013	Served at food pantry on west side of Chicago
2004	Volunteer for Habitat for Humanity Bolivia
2004	Student Council Senator, Eastern Mennonite University