

HENRY L. HALLOCK, PH.D.

Program in Neuroscience • Lafayette College

Oechsle Hall, Easton, PA 18042

hallockh@lafayette.edu • henryhallock.github.io

I am a behavioral neuroscientist interested in how the brain encodes memory, attention, and decision-making. My long-term research goal is to identify circuits (groups of connected neurons) in the brain that regulate these processes, and to understand how these circuits function at the molecular and systems levels. I believe that a fundamental understanding of how memory, attention, and decision-making circuits function will be critical for precision medicine approaches to treating cognitive symptoms in neuropsychiatric disorders, including schizophrenia, post-traumatic stress disorder, major depressive disorder, and attention-deficit hyperactivity disorder.

EDUCATION

Ph.D. – University of Delaware , Psychology (Behavioral Neuroscience Concentration)	2016
B.A. – Millersville University of Pennsylvania , Psychology (Biology Minor)	
<i>Magna cum laude</i>	2010

POSITIONS & EMPLOYMENT

Assistant Professor	2021-Present
Neuroscience Program	
Lafayette College	

Postdoctoral Associate/Fellow	2016-2021
The Lieber Institute for Brain Development, The Johns Hopkins School of Medicine	
Advisor: Keri Martinowich, Ph.D.	

Adjunct Assistant Professor of Biology	2021
Department of Biology	
Goucher College	

Instructor of Record	2020-Present
Department of Neuroscience	
The Johns Hopkins University	

Graduate Student (Ph.D.)	2010-2016
Department of Psychological and Brain Sciences	
University of Delaware	
Advisor: Amy Griffin, Ph.D.	
Thesis Title: "Prefrontal-thalamo-hippocampal contributions to spatial working memory"	

Instructor of Record	2015-2016
Department of Psychological and Brain Sciences University of Delaware	
Graduate Teaching Assistant	2010-2013
Department of Psychological and Brain Sciences University of Delaware	
Undergraduate Research Assistant	2008-2010
Department of Psychology Millersville University of Pennsylvania Advisors: Shaun Cook, Ph.D. & Shawn Gallagher, Ph.D.	

FUNDING AS PRINCIPAL INVESTIGATOR

CURRENT

Young Investigator Award, Brain and Behavior Research Foundation	2021-2023
<i>'Neural correlates of sustained attention during touchscreen-based cognitive testing'</i>	
Award total: \$70,000	

PAST

NIH Ruth L. Kirschstein National Research Service Award (NRSA) for Individual Postdoctoral Fellows (F32), National Institute of Mental Health	2019-2022
<i>'Regulation of fear expression by activity-dependent BDNF in direct hippocampal-to-prelimbic projections'</i>	
Award total: \$206,000	
Mission Forward Award, Lieber Institute for Brain Development	2018-2019
<i>'Molecular signatures of prefrontal-projecting hippocampal neurons'</i>	
Award total: \$100,000	

AWARDS/HONORS

Society of Biological Psychiatry Travel Award (\$2,000)	2020
Society of Biological Psychiatry "Rising Star"	2019
Gordon Research Seminar "Amydala" Meeting Poster Prize (\$300)	2019
Johns Hopkins Postdoctoral Retreat Best Poster (\$1,000 Travel Award)	2018
Society for Neuroscience, Delaware Chapter Best Poster	2014
University of Delaware Graduate Student Travel Award (\$1,500)	2013

University of Delaware Graduate Research Fellowship	2013
University of Delaware Graduate Student Travel Award (\$1,500)	2012
NSF Graduate Research Fellowship Honorable Mention	2012
University of Delaware Graduate Student Travel Award (\$1,500)	2011
Society for Neuroscience, Delaware Chapter Best Poster	2011
Millersville University Intramural Grant for Undergraduate Research (\$300)	2009
Psi Chi National Honor Society in Psychology	2009
Dean's List, Millersville University of Pennsylvania	2007-2010

TEACHING: COURSES TAUGHT

Lafayette College (Instructor of Record)

<i>Introduction to Neuroscience (NEUR 201)</i>	2021
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<i>Computational Neuroscience (NEUR 256)</i>	2021
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Johns Hopkins University (Instructor of Record)

<i>Introduction to Neuroscience (AS.080.15; Virtual with asynchronous components)</i>	2021
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California State University – Dominguez Hills (Guest Lecturer)

<i>Synaptic Plasticity</i>	2021
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Goucher College (Adjunct Instructor)

<i>Introductory Biology (BIO 102)</i>	2021
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Hampden-Sydney College (Guest Lecturer)

<i>Neurobiology (BIOL 333: Virtual)</i>	2020
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University of Delaware (Instructor of Record)

<i>Measurement and Statistics (PSYC 209)</i>	2015
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University of Delaware (Guest Lecturer)

<i>Introduction to Neuroscience (NSCI 100)</i>	2013,2014
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<i>Spatial Cognition (NSCI 636)</i>	2013
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<i>Advanced Neurophysiology (NSCI 627)</i>	2013
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<i>Brain and Behavior (PSYC 314)</i>	2011
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<i>Introduction to Psychology (PSYC 100)</i>	2011
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TEACHING: PEDAGOGICAL TRAINING

Johns Hopkins Teaching Academy Certificate of Completion	2020-2021
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Johns Hopkins Teaching Academy Collaborative Teaching Fellowship	2021
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PUBLICATIONS (* DENOTES UNDERGRADUATE/POST-BAC MENTEE)

PREPRINTS

3. *Stout, J.J., **Hallock, H.L.**, Adiraju, S.S., & Griffin, A.L. (2021). The ventral midline thalamus mediates successful deliberation by coordinating prefrontal and hippocampal neural activity. *bioRxiv*, doi: <https://doi.org/10.1101/2021.06.30.450519>
2. DeBrosse, A.C., Li, Y., Wiseman, R., Ross, R., Garrison, S., **Hallock, H.L.**, Barrow, J.C., Martinowich, K., & Carr, G.V. (2021). Stimulus degradation impairs performance in a rodent continuous performance test. *bioRxiv*, doi: <https://doi.org/10.1101/2021.08.31.458320>
1. Rodriguez, L.A., Kim, S-H., Page, S.C., Nguyen, C.V., Pattie, E.A., **Hallock, H.L.**, Valerino, J., Maynard, K.R., Jaffe, A.E., & Martinowich, K. (2021). Expression of brain-derived neurotrophic factor in basolateral amygdala inputs to lateral septum is necessary for mice to identify socially novel individuals. *bioRxiv*, doi: <https://doi.org/10.1101/2021.10.21.464669>

RESEARCH PAPERS

12. **Hallock, H.L.**, *Quillian, H.M., Maynard, K.R., *Mai, Y., Chen, H-Y., Hamersky, G.R., Shin, J.H., Maher, B.J., Jaffe, A.E., & Martinowich, K. (2020). Molecularly-defined hippocampal inputs regulate population dynamics in the prelimbic cortex to suppress context fear memory retrieval. *Biological Psychiatry*, **88**: 554-565
11. Maynard, K.R., Kardian, A., Hill, J.L., *Mai, Y., Barry, B., **Hallock, H.L.**, Jaffe, A.E., & Martinowich, K. (2020). TrkB signaling influences gene expression in cortistatin-expressing interneurons. *eNeuro*, **7**: 10.1523/ENEURO.0310-19.2019
10. **Hallock, H.L.**, *Quillian, H.M., *Mai, Y., Maynard, K.R., & Martinowich, K. (2019). Manipulation of a genetically and spatially defined sub-population of BDNF-expressing neurons potentiates learned fear and decreases hippocampal-prefrontal synchrony in mice. *Neuropsychopharmacology*, **44**: 2239-2246
9. Hill, J.L., Jimenez, D.V., *Mai, Y., Maynard, K.R., Hardy, N.F., **Hallock, H.L.**, Ren, M., Chen, H-Y., Yang, F., Maher, B.J., Schloesser, R.J., & Martinowich, K. (2018). Cortistatin interneurons require TrkB signaling to prevent brain hyper-excitability. *Brain Structure and Function*, **224**: 471-483
8. **Hallock, H.L.**, Garman, H.D., Cook, S.P., & Gallagher, S.P. (2017). Recognition without words: Using taste to explore survival processing. *The Journal of Undergraduate Neuroscience Education*, **15**: A1-A5

7. **Hallock, H.L.**, Wang, A., & Griffin, A.L. (2016). Ventral midline thalamus is critical for hippocampal-prefrontal synchrony and spatial working memory. *The Journal of Neuroscience*, **36**: 8372-8389 -- **featured article*
6. *Layfield, D., *Patel, M.M., **Hallock, H.L.**, & Griffin, A.L. (2015). Inactivation of the nucleus reuniens/rhomboid causes a delay-dependent impairment of spatial working memory. *Neurobiology of Learning and Memory*, **125**: 163-167
5. **Hallock, H.L.**, Wang, A., *Shaw, C.L., & Griffin, A.L. (2013). Transient inactivation of the thalamic reuniens and rhomboid nuclei produces deficits of a working memory-dependent tactile-visual conditional discrimination T-maze task. *Behavioral Neuroscience*, **127**: 860-866
4. **Hallock, H.L.**, *Arreola, A.C., *Shaw, C.L., & Griffin, A.L. (2013). Dissociable roles of the dorsal striatum and dorsal hippocampus in conditional discrimination and spatial alternation T-maze tasks. *Neurobiology of Learning and Memory*, **100**: 108-116
3. *Shaw, C.L., *Watson, G.D.R., **Hallock, H.L.**, Cline, K.M., & Griffin, A.L. (2013). The role of the medial prefrontal cortex in the acquisition, retention, and reversal of a tactile visuospatial conditional discrimination task. *Behavioural Brain Research*, **236**: 94-101
2. **Hallock, H.L.**, & Griffin, A.L. (2013). Dynamic coding of dorsal hippocampal neurons between tasks that differ in structure and memory demand. *Hippocampus*, **23**: 169-186
1. Griffin, A.L., & **Hallock, H.L.** (2013). Hippocampal signatures of episodic memory: Evidence from single-unit recording studies. *Frontiers in Behavioral Neuroscience*, <https://doi.org/10.3389/fnbeh.2013.00054>

TALKS/SEMINARS

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| <p>"Decision making and the brain: From circuits to molecules"
 <i>Neuroscience seminar</i>, Lafayette College, Virtual
 (invited speaker)</p> | 2021 |
| <p>"Decision making and the brain: From circuits to molecules"
 <i>Psychology department seminar</i>, CSU – Dominguez Hills, Virtual
 (invited speaker)</p> | 2021 |
| <p>"From circuits to molecules: How the anterior cingulate cortex regulates cognitive domains affected in mental illness"
 <i>Staying Connected Post-Doc Seminar Series</i>, Virtual
 (selected to present).</p> | 2020 |
| <p>"Decision making and the brain: From circuits to molecules"
 <i>Biology department seminar</i>, Hampden-Sydney College, Virtual
 (invited speaker)</p> | 2020 |

- "Molecularly-defined hippocampal inputs regulate population dynamics in the prelimbic cortex to suppress context fear memory retrieval"
Pavlovian Society meeting, Virtual. 2020
- "Molecular targeting in a spatially-localized context fear memory circuit"
Inscopix seminar, The National Institutes of Health (NIH), Bethesda, MD
(invited speaker). 2019
- "Molecular targeting in a spatially-localized context fear memory circuit"
Baltimore Brain Series, University of Maryland Medical School, Baltimore, MD
(selected to present). 2019
- "Regulation of fear expression by activity-dependent BDNF in direct hippocampal-to-prelimbic projections"
Society for Biological Psychiatry (SOBP) Rising Star Symposium, Chicago, IL
(selected to present). 2019
- "Molecular regulation of prefrontal circuits that control behavior"
Postdoc Seminar Series, Lieber Institute for Brain Development, Baltimore, MD 2019
- "The molecular logic of fear extinction circuitry: Implications for psychiatry"
PaPC conference, Millersville University, Millersville, PA
(invited speaker; keynote talk) 2017
- "Prefrontal-thalamo-hippocampal circuit contributions to spatial working memory"
Lieber Institute for Brain Development, Baltimore, MD
2016
- "Prefrontal-thalamo-hippocampal circuit contributions to spatial working memory"
Harvey lab, Harvard University, Cambridge, MA
(invited speaker) 2015
- "Prefrontal-thalamo-hippocampal circuit contributions to spatial working memory"
Gordon lab, Columbia University, New York City, NY
(invited speaker) 2015
- "Prefrontal-thalamo-hippocampal circuit contributions to spatial working memory"
Jacobs lab, Drexel University, Philadelphia, PA
(invited speaker) 2014
- "Spatial working memory deficits accompany reductions in hippocampal-prefrontal synchrony following inactivation of the ventral midline thalamic reuniens and rhomboid nuclei"
Nanosymposium, Society for Neuroscience, Washington, D.C.
(selected to present) 2014

"Early life adversity and function of the medial prefrontal cortex throughout the lifespan"

Development Seminar Series, University of Delaware, Newark, DE

(invited speaker)

2013

"Memory demand and task structure differentially modulate spatial representations of hippocampal neurons in dorsal CA1"

Data Blitz, Neurobiology of Learning and Memory Conference, Park City, UT

2012

"Charles Bonnet and the clinical significance of insight"

History of Psychology Symposium, Eastern Psychological Association, Cambridge, MA

2011

"Attentional set shifting as an interspecies tool for probing prefrontal cortex function"

Development Seminar Series, University of Delaware, Newark, DE

(invited speaker)

2011

TRAINEE MENTORSHIP

Lafayette College

2021-Present

Undergraduates: Genevieve Craig

Johns Hopkins University

2016-2021

Post-baccalaureate: Jessica Valerino, Henry Quillian (grad student at Yale), Yishan

Mai (grad student at Duke NUS), Kyndall Nicholas (PREP scholar: graduate student at Penn)

Undergraduates: Alisha Kardian (grad student at Baylor), Richard de los Santos Abreu (grad student at NYC), Ernest Ekunseitan

University of Delaware

2010 - 2016

Technicians: Zach Gemzik (grad student at Delaware), Arick Wang (grad student at Emory), Dylan Layfield (grad student at Indiana)

Masters students: Eric Myhre, Brett Emanuel (grad student at Oregon), John Stout (grad student at Delaware)

Undergraduates: Monica Patel (supervised honors thesis), Brendan Farrell, Alexander Sidor (med school at NYU), Sarah Amos, Crystal Shaw, Glenn Watson (post-doc at Duke), Adrian Arreola, Kelsey Holiday (grad student at UCSD)

SERVICE/OUTREACH

Ad hoc reviewer for Cerebral Cortex, Neuroscience, Developmental Cognitive Neuroscience, Molecular Psychiatry, European Journal of Neuropharmacology, Frontiers in Behavioral Neuroscience, Scientific Reports, Hormones and Behavior

Treasurer, Lieber Institute for Brain Development Postdoctoral Association

2019-2021

Hallock CV 7

Mentor/letter writer, Letters to a Pre-Scientist	2019-Present
University of Delaware Outreach Program (Project BrainLight)	2014-2016
Organizer, Oscillations Journal Club, University of Delaware	2015
Big Brother, Big Brothers/Big Sisters, Newark, DE	2013-2016
Graduate recruitment, University of Delaware	2011-2015

PROFESSIONAL MEMBERSHIPS

Society for Neuroscience	2010-Present
Eastern Psychological Association	2009-2013
Society of Biological Psychiatry	2016-Present

CONFERENCE ABSTRACTS (* DENOTES UNDERGRADUATE/POST-BAC MENTEE)

- 2021** Hallock, H.L., *Valerino, J., DeBrosse, A.C., Noback, M., *Quillian, H.M., Barrow, J.C., Jaffe, A.E., Carr, G.V., & Martinowich, K. *Molecular and circuit-specific analysis of locus coeruleus-prefrontal networks during a touchscreen rodent continuous performance test.* Society of Biological Psychiatry, San Diego, CA (Accepted).
- 2021** Stout, J.C., Hallock, H.L., Adiraju, S., & Griffin, A.L. *Role of the ventral midline thalamus in vicarious trial-and-error events.* Neurobiology of Learning and Memory, Virtual.
- 2020** Rodriguez, L., Kim, S.H., Page, S.C., Hallock, H.L., Maynard, K.R., & Martinowich, K. *Brain-derived neurotrophic factor from basolateral amygdala inputs to lateral septum are necessary for social recognition in mice.* American College of Neuropsychopharmacology, Virtual.
- 2020** Hallock, H.L., *Valerino, J., DeBrosse, A.C., Noback, M., *Quillian, H.M., Barrow, J.C., Jaffe, A.E., Carr, G.V., & Martinowich, K. *Molecular and circuit-specific analysis of locus coeruleus-prefrontal networks during a touchscreen rodent continuous performance test.* American College of Neuropsychopharmacology, Virtual.
- 2020** Hallock, H.L., *Quillian, H.M., Maynard, K.R., *Mai, Y., Chen, H.Y., Hamersky, G.R., Shin, J.H., Maher, B.J., Jaffe, A.E., & Martinowich, K. *Molecularly-defined hippocampal inputs regulate population dynamics in the prelimbic cortex to suppress context fear memory retrieval.* Pavlovian Society, virtual
- 2019** Hallock, H.L., DeBrosse, A.C., Noback, M., *Quillian, H.M., Barrow, J.C., Carr, G.V., & Martinowich, K. *Involvement of a locus coeruleus-to-prefrontal (LC-mPFC) circuit in a touchscreen variant of the continuous performance test (CPT) in mice.* Society for Neuroscience, Chicago, IL.
- 2019** Hallock, H.L., *Quillian, H.M., *Mai, Y., Chen, H-Y., Hamersky, G.R., Maher, B.J., Jaffe, A.E., & Martinowich, K. *A molecularly and anatomically-defined hippocampal-prelimbic circuit for the regulation of context fear suppression,* GRC Amygdala, Easton, MA

- 2019 **Hallock, H.L.**, *Quillian, H.M., *Mai, Y., Chen, H-Y., Hamersky, G.R., Maher, B.J., Jaffe, A.E., & Martinowich, K. *Regulation of fear expression by activity-dependent BDNF in direct hippocampal-to-prelimbic projections*. Society of Biological Psychiatry, Chicago, IL.
- 2018 **Hallock, H.L.**, *Mai, Y., Hill, J.L., Chen, H-Y., Hamersky, G.R., Maher, B.J., & Martinowich, K. *Regulation of fear expression by activity-dependent BDNF in direct hippocampal-to-prelimbic projections*. American College of Neuropsychopharmacology, Hollywood, FL.
- 2018 *Quillian, H.M., **Hallock, H.L.**, *Mai, Y., Hill, J.L., Maynard, K.R., & Martinowich, K. *Selective manipulation of Bdnf promoter IV-expressing cells in the hippocampus modulates fear expression and hippocampal-prefrontal synchrony in mice*. Society for Neuroscience, San Diego, CA.
- 2018 **Hallock, H.L.**, *Mai, Y., *Quillian, H.M., Hill, J.L., Chen, H-Y., Hamersky, G.R., Maher, B.J., & Martinowich, K. *Regulation of fear expression by activity-dependent BDNF in direct hippocampal-to-prelimbic projections*. Society for Neuroscience, San Diego, CA.
- 2018 **Hallock, H.L.**, *Mai, Y., Hill, J.L., Chen, H-Y., Hamersky, G.R., Maher, B.J., & Martinowich, K. *Regulation of fear expression by activity-dependent BDNF in direct hippocampal-to-prelimbic projections*. Johns Hopkins Postdoctoral Retreat, Baltimore, MD.
- 2017 **Hallock, H.L.**, *Mai, Y., Hill, J.L., & Martinowich, K. *Fear extinction deficits are associated with altered hippocampal-prefrontal function in mice with impaired activity-dependent BDNF signaling*. American College of Neuropsychopharmacology, Palm Springs, CA.
- 2015 Maisson, D.J., *Emanuel, B., **Hallock, H.L.**, Gemzik, Z., Donahue, M., & Griffin, A.L. *Distinct contributions of hippocampal and prefrontal afferents to nucleus reuniens during spatial working memory*. Society for Neuroscience, San Diego, CA.
- 2014 **Hallock, H.L.**, & Griffin, A.L. *Spatial working memory deficits accompany reductions in hippocampal-prefrontal synchrony following inactivation of the ventral midline thalamic reuniens and rhomboid nuclei*. Society for Neuroscience, Washington, D.C.
- 2014 **Hallock, H.L.**, & Griffin, A.L. *Spatial working memory deficits accompany reductions in hippocampal-prefrontal synchrony following inactivation of the ventral midline thalamic reuniens and rhomboid nuclei*. Pavlovian Society, Seattle, WA.
- 2013 *Patel, M.M., **Hallock, H.L.**, Wang, A., *Layfield, D.M., *Shaw, C.L., & Griffin, A.L. *Transient inactivation of the thalamic nucleus reuniens and rhomboid nucleus produces deficits of a working memory-dependent tactile-visual conditional discrimination task*. Society for Neuroscience, San Diego, CA.
- 2013 **Hallock, H.L.**, & Griffin, A.L. *Different modes of communication in the hippocampal-prefrontal micro-circuit during memory-guided decision making*. Spring Hippocampus Conference, Taormina, Sicily.
- 2013 **Hallock, H.L.**, & Griffin, A.L. *Working memory modulates hippocampal-prefrontal synchrony across mnemonically distinct T-maze tasks*. Neurobiology of Learning and Memory, Park City, UT.

- 2012** *Arreola, A.C., Hallock, H.L., *Shaw, C.L., *Patel, M.M., Amos, S.M., Chandrasekhar, V., *Watson, G.D.R., & Griffin, A.L. *Dissociable roles of the dorsal striatum and dorsal hippocampus in the performance of mnemonically distinct T-maze tasks*. Society for Neuroscience, New Orleans, LA.
- 2012** Hallock, H.L., & Griffin, A.L. *The effect of delay-dependent working memory demand on hippocampal-prefrontal synchrony during awake behavior and sleep*. Society for Neuroscience, New Orleans, LA.
- 2012** Hallock, H.L., & Griffin, A.L. *Memory demand and task structure differentially modulate spatial representations of hippocampal neurons in dorsal CA1*. Neurobiology of Learning and Memory, Park City, UT.
- 2011** Hallock, H.L., Cline, K.M., & Griffin, A.L. *Dynamic coding of dorsal hippocampal neurons between tasks that differ in structure and memory demand*. Society for Neuroscience, Washington, D.C.
- 2011** *Shaw, C.L., *Watson, G.D.R., Hallock, H.L., Cline, K.M., & Griffin, A.L. *Effects of mPFC inactivation on acquisition, performance, and reversal of a tactile visuospatial conditional discrimination task*. Society for Neuroscience, Washington, D.C.
- 2011** Cook, S.P., Gallagher, S.P., Hallock, H.L., & Garman, H. *Survival processing in flavor memory*. Eastern Psychological Association, Cambridge, MA.