

# Seth R. Taylor, Ph.D.

203-361-1758

seth\_taylor@byu.edu

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## Education

**Yale University**, New Haven, CT 2008-2014

- Ph.D. with Distinction
- Dissertation: Cell-type specific projections and manipulations within the mesolimbic system

**Brigham Young University**, Provo, UT 2002-2008

- Bachelor of Science in Neuroscience
- Graduated summa cum laude

## Professional Employment

Jan 2023 – Present      Assistant Professor, Cell Biology and Physiology  
Brigham Young University

July 2020 – Dec 2022      Research Assistant Professor, Cell and Developmental Biology  
Vanderbilt University

Feb 2018 – June 2020      Postdoctoral Scholar, Cell and Developmental Biology  
Vanderbilt University

Feb 2015 – Jan 2018      Postdoctoral Scholar, Neurobiology  
University of California, San Diego

## Research Experience

**David Miller Lab**, Vanderbilt University      February 2018 – Dec 2022

- Led Miller lab efforts in a collaboration with labs at Yale and Columbia to characterize the transcriptome of the entire *C. elegans* nervous system in both sexes across development using FACS isolation and both bulk and single-cell RNA sequencing. I used this data to study mechanisms underlying the formation of specific synapses in the *C. elegans* motor circuit.

**Darwin Berg Lab**, University of California, San Diego      February 2015-January 2018  
Postdoctoral Research

- Researched the role of microRNA-218 in early postnatal hippocampal development

**Marina Picciotto Lab**, Yale University      January 2009-December 2014  
Dissertation Research

- Researched anatomical circuits and molecular mechanisms underlying nicotine induced behaviors in mice.
- Described extensive long-range GABAergic and glutamatergic projection systems from the mouse ventral tegmental area, and developed adeno-associated viral system for cell type-specific expression of shRNAs

**Scott Steffensen Lab**, Brigham Young University  
Undergraduate Research Assistant

June 2006-August 2008

- Performed whole-cell recordings in rat and mouse brain slice preparations to examine effects of cocaine and alcohol on midbrain dopamine neurons

## **Publications**

Mineur YS, Mose TN, Maibom KL, Pittenger ST, Soares AR, Wu H, **Taylor SR**, Huang Y, Picciotto MR. ACh signaling modulates activity of the GABAergic signaling network in the basolateral amygdala and behavior in stress-relevant paradigms. *Molecular Psychiatry* (2022) 27(12): 4918-4927.

**Taylor SR**, Santpere G, Weinreb A, Barrett A, Reilly MB, Xu C, Varol E, Oikonomou P, Glenwinkel L, McWhirter R, Poff A, Basavaraju M, Rafi I, Yemini E, Cook SJ, Abrams A, Vidal B, Cros C, Tavazoie S, Sestan N, Hammarlund M, Hobert O, Miller DM. Molecular topography of an entire nervous system. *Cell* (2021) 184(16):4329-4347.

Glenwinkel L, **Taylor S**, Langebeck-Jensen K, Pereira L, Reilly MB, Basavaraju M, Rafi I, Yemini E, Pocock R, Sestan N, Hammarlund M, Miller DM, Hobert O. In silico analysis of the transcriptional regulatory logic of neuronal identity specification throughout the *C. elegans* nervous system. *eLife* (2021) 10:e64906.

Barrett A, McWhirter R, **Taylor SR**, Weinreb A, Miller DM, Hammarlund M. A head-to-head comparison of ribodepletion and polyA selection approaches for *C. elegans* low input RNA-sequencing libraries. *G3* (2021) 11(7), doi: 10.1093/g3journal/jkab121

Gerhard DM, Pothula S, Liu RJ, Wu M, Li XY, Girgenti MJ, **Taylor SR**, Duman CH, Delpire E, Picciotto MR, Wohleb ES, Duman RS. GABA interneurons are the cellular trigger for ketamine's rapid antidepressant actions. *J Clin Invest* (2020) 130(3):1336-1349.

Deyama S, Bang E, Wohleb ES, Li XY, Kato T, Gerhard DM, Dutheil S, Dwyer JM, **Taylor SR**, Picciotto MR, Duman RS. Role of Neuronal VEGF signaling in the prefrontal cortex in the rapid antidepressant effects of ketamine. *Am J Psychiatry* (2019) 176(5):388-400.

Calarco CA, Li Z, **Taylor SR**, Lee S, Zhou W, Friedman JM, Mineur YS, Gotti C, Picciotto MR. Molecular and cellular characterization of nAChR subtypes in the arcuate nucleus of the mouse hypothalamus. *European Journal of Neuroscience*. (2018) 48:1600-1619.

Lippi G, Fernandes CC, Ewell LA, John D, Romoli B, Curia G, **Taylor SR**, Frady EP, Jensen AB, Liu JC, Chaabane MM, Belal C, Nathanson JL, Zoli M, Leutgeb JK, Biagini G, Yeo GW, Berg DK. MicroRNA-101 regulates multiple developmental programs to constrain excitation in adult neural networks. *Neuron*. (2016) 92:1337-1351.

Fan L, Balakrishna S, Jabba SV, Bonner PE, **Taylor SR**, Picciotto MR, Jordt SE. Menthol decreases oral nicotine aversion in C56Bl/6 mice through a TRPM8-dependent mechanism. *Tab Control* (2016) 25:ii50-ii54.

Wohleb ES, Wu M, Gerhard DM, **Taylor SR**, Picciotto MR, Alreja M, Duman RS. GABA interneurons mediate the rapid antidepressant-like effects of scopolamine. *J Clin Invest* (2016) 126(7):2482-94.

**Taylor SR**, Badurek S, Minichiello L, DiLeone RJ, Nashmi R, Picciotto MR. GABAergic and glutamatergic projections of the mouse ventral tegmental area. *J Comp Neurol* (2014) 522(14):3308-34.

Mineur YS, **Taylor SR**, Picciotto MR. Calcineurin down-regulation in the amygdala is sufficient to induce anxiety-like and depression-like behaviors in C57Bl/6J male mice. *Biol Psychiatry* (2014) 75(12):991-8.

Mazei-Robison MS, Appasani R, Edwards S, Wee S, **Taylor SR**, Picciotto MR, Koob GF, Nestler EJ. Self-administration of ethanol, cocaine, or nicotine does not decrease the soma size of ventral tegmental area dopamine neurons. *PLoS One*. (2014) 9(4):e95962.

Gamo NJ, Duque A, Paspalas CD, Kata A, Fine R, Boven L, Bryan C, Lo T, Anighoro K, Bermudez L, Peng K, Annor A, Raja A, Mansson E, **Taylor SR**, Kiran P, Simen AA, Arnsten AFT. Role of disrupted in schizophrenia 1 (DISC1) in stress-induced prefrontal cognitive dysfunction. *Translational Psychiatry* (2013) Dec 3;3:e328.

Richard MB, **Taylor SR**, Greer CA. Age-induced disruption of selective olfactory bulb synaptic circuits. *Proceedings of the National Academy of Sciences U S A* (2010) 31;107(35):15613-8.

Ludlow K.H., Bradley K.D., Allison D.W., **Taylor S.R.**, Yorgason J.T., Hansen D.M., Walton C.H., Sudweeks S.N., Steffensen S.C. Acute and chronic ethanol modulate dopamine D2-subtype receptor responses in ventral tegmental area GABA neurons. *Alcohol: Clinical and Experimental Research* (2009) 33(5):804-11.

Steffensen, S.C., **Taylor, S.R.**, Horton, M.L., Barber, E.N., Lyle, L.T., Stobbs, S.H. and Allison, D.W. Cocaine disinhibits dopamine neurons in the ventral tegmental area via use-dependent blockade of GABA neuron voltage-sensitive sodium channels. *European Journal of Neuroscience* (2008) 28: 2028-2040.

## **Preprints**

Ripoll-Sanchez L, Watteyne J, Sun HS, Fernandez R, **Taylor SR**, Weinreb A, Hammarlund M, Miller DM, Hobert O, Beets I, Vertes PE, Schafer WR. The neuropeptidergic connectome of *C. elegans*. *bioRxiv* (2022) doi: <https://doi.org/10.1101/2022.10.30.514396>

**Taylor SR**, Kobayashi M, Vilella A, Tiwari D, Zolboot N, Hartzell A, Girgiss C, Abaci Y, De Sanctis C, Bellenchi GC, Darnell RB, Gross C, Zoli M, Berg DK, Lippi G. MicroRNA-218 instructs proper assembly of hippocampal networks. *bioRxiv* (2022) doi: <https://doi.org/10.1101/2022.08.24.505085>

### **Presentations**

**Taylor SR**, McWhirter R, Poff A, Tipps J, Miller DM, CeNGEN Consortium. A single-cell gene expression atlas of an entire nervous system. *Oral presentation, Molecular Mechanisms of Neuronal Connectivity (Cold Spring Harbor Meeting)*. July 2020.

**Taylor SR**, Palumbos S, McWhirter M, Poff A, Miller DM III, CeNGEN Consortium. Profiling gene expression of an entire nervous system one neuron at a time. *Oral presentation at International C. elegans Conference*, July 2019.

**Taylor SR**, Lippi G, Liu JC, Berg DK. MicroRNA-218 regulates excitability of hippocampal networks. *Short Talk at Keystone Symposium: Synapses and Circuits: Formation, Function and Dysfunction*, March 2017.

**Taylor SR**. Glutamatergic and GABAergic Efferents of the VTA. *Presented in a panel session at Winter Conference on Brain Research*. 2016.

**Taylor SR**, Picciotto MR. Ventral Tegmental Area GABA projections. *Society for Neuroscience Abstract*. 2013.

Fan L, **Taylor SR**, Liu B, Sui A, Morris JB, Picciotto M, Jordt S-E. Menthol and artificial sweeteners increase oral nicotine intake in mice. *Society for Neuroscience Abstract*. 2013.

**Taylor SR**, Jain S, Picciotto MR. Characterization of VTA GABA projection neurons. *Society for Neuroscience Abstract*. 2012.

Richard, M., **Taylor, S.**, Greer, C. Aging in the synaptic circuitry of the olfactory bulb. *Society for Neuroscience Abstract*. 2009.

Steffensen, S.C., Fleming, D.E., **Taylor, S.R.**, Hansen, D.M., Walton, C.H., Allison, D.W. Cocaine disinhibits dopamine neurons in the ventral tegmental area via use-dependent blockade of GABA neuron voltage-sensitive sodium channels. *Society for Neuroscience Abstract*. 2008.

Allison, D.W., Mickelsen, R., **Taylor, S.R.**, Lassen, M.B., Fleming, D.E., Steffensen, S.C., Thomas, S.J. Cocaine reduces the excitability and electrical coupling of VTA GABA neurons via its sodium channel blocking actions. *Society for Neuroscience Abstract* 2007.

## **Honors and Awards**

- Awarded PhD with Distinction, Yale University, 2014
- National Science Foundation Graduate Research Fellowship, Yale 2010-2013
- Passed Qualifying Exam with Distinction, Yale University, 2010
- Neuroscience Valedictorian, BYU 2008
- Graduated Summa Cum Laude, BYU 2008
- Office of Creative Research Activities Undergraduate Research Grant, BYU 2008
- National Merit Scholar, BYU 2002-2008
- Phi Kappa Phi, BYU 2007-2008

## **Teaching Experience**

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|------------------------|--|-------------|
| <b>Teaching Fellow</b> | Yale University<br>Department of Psychology - Drugs, Brain & Behavior  | Winter 2014 |
|                        | <ul style="list-style-type: none"><li>• Delivered lecture on tobacco and nicotine</li><li>• Helped write exams</li><li>• Led review sessions</li></ul>                       |             |
| <b>Teaching Fellow</b> | Yale University<br>Department of Psychology - Animals Models of Psychiatric Disorders,   | Fall 2013   |
|                        | <ul style="list-style-type: none"><li>• Led review sessions</li></ul>  |             |
| <b>Teaching Fellow</b> | Yale University<br>Principles of Neuroscience (Graduate Level Neuroscience Course)   | Fall 2010   |
|                        | <ul style="list-style-type: none"><li>• Evaluated response papers</li></ul>  |             |
| <b>Teaching Fellow</b> | Yale University<br>Department of Cognitive Science - Brain and Thought   | Fall 2009   |
|                        | <ul style="list-style-type: none"><li>• Led discussion section</li><li>• Helped select primary research articles for student reading</li><li>• Led review sessions</li></ul> |             |

## **Professional Development and Teaching Training**

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|--|-------------|
| Seminar in College Teaching, Vanderbilt University   | Fall 2019   |
| <ul style="list-style-type: none"><li>• Part of the Certificate in College Teaching from the Center for Teaching at Vanderbilt</li></ul> |             |
| Sanford Burnham Prebys Leaders Program   | 2016-2017   |
| <ul style="list-style-type: none"><li>• A year-long training program in leadership styles and development</li></ul>                      |             |
| Teaching and Learning at the College Level, UC San Diego   | Spring 2017 |
| <ul style="list-style-type: none"><li>• A quarter-long course on evidence-based teaching offered</li></ul>                               |             |

by the UCSD Teaching and Learning Commons

Course Design Studio, UC San Diego

Spring 2017

Fundamentals of Teaching: Science, Yale University

Fall 2010

## **Community Teaching and Outreach**

### **Neuroscience Outreach Program**

2009-2014

- Established schedule of visits to local schools (elementary through high school)
- Taught and led demonstrations on comparative neuroanatomy, muscle physiology, sensation and perception, and sheep brain dissections
- Secured an external grant for and organized a High School Brain Awareness Day event bringing 60-70 high school students to Yale in Spring 2010