

# William J. Wright, Ph.D.

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## EDUCATION

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<b>University of Pittsburgh</b> , Pittsburgh PA Ph.D. Neuroscience <i>Thesis: Interrogating the role of cocaine-generated silent synapses in the regulation of cocaine-associated memory dynamics</i>	2015-2021
<b>Wofford College</b> , Spartanburg SC B.S. Biology, <i>Magna Cum Laude</i>	2011-2015

## RESEARCH EXPERIENCE

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<b>Postdoctoral Fellow</b> , University of California, San Diego Advisor: Dr. Takaki Komiyama <ul style="list-style-type: none"><li>- Investigating how natural activity patterns shape various forms of synaptic plasticity over the course of learning.</li><li>- Probing the functional role of synaptic plasticity in the reorganization of neural circuit activity dynamics underlying learning</li></ul> This work is funded by the NIH and Schmidt Sciences Foundation.	2021-present
<b>Graduate Research Fellow</b> , University of Pittsburgh Advisor: Dr. Yan Dong <ul style="list-style-type: none"><li>- Demonstrated that the natural dynamics of cocaine-associated memories can be governed by the functional state of a select population of synapses.</li><li>- Characterized a novel inhibitory microcircuit with the Nucleus Accumbens composed of CB1-expressing fast-spiking interneurons.</li><li>- Contributed to characterization of the novel transcription factor <i>Zfp-189</i> and its regulation of depression and addiction.</li></ul> This work was funded by the NIH and the University of Pittsburgh.	2015-2021

## RESEARCH SUPPORT

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<u>Pending Support</u> <b>Compartment-Specific Synaptic Organization and Plasticity During Learning</b> Identifier: K99/R00 MH140060      Total funds: \$990,866 Role: Principal Investigator      Status: Pending council review ( <i>Impact Score: 16</i> )	04/2025-03/2030
<u>Current Support</u> <b>Eric and Wendy Schmidt AI in Science Fellowship</b> Total funds - \$184,000      Role: Principal Investigator	02/2023-01/2025
<u>Previous Support</u> <b>Neural Circuits Postdoctoral Training Program T32</b> Identifier: T32 NS007220      Total funds - \$63,665	11/2021-09/2022

PI: Nicholas Spitzer

Role: Trainee

**Fast-Spiking Interneurons in the Nucleus Accumbens and Cue-Induced Cocaine Seeking**

05/2018-08/2021

Identifier: F31 DA043940

Total funds - \$160,874

Role: Principal Investigator

**Mellon Fellowship**

09/2017-04/2018

Total funds - \$22,752

Role: Principal Investigator

**Predoctoral Training in Basic Neuroscience**

09/2016-08/2017

Identifier: T32 NS007433

Total funds - \$30,000

PI: Alan Sved

Role: Trainee

**Basic and Applied Summer Training in Alcohol Research**

05/2014-07/2014

Identifier: R25 AA022823

Total funds - \$4,000

PI: Kimberly Nixon

Role: Trainee

**HONORS, AWARDS, AND FELLOWSHIPS**

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Eric and Wendy Schmidt AI in Science Postdoctoral Fellowship	2023
BRAIN Initiative F32 Fellowship (declined due to concurrent funding)	2023
Neural Circuits T32 Training Grant Fellow	2021
NRSA F31 Predoctoral Fellowship	2018
Mellon Fellowship	2017
Program for Excellence in Science (AAAS)	2016
Predoctoral Training in Neuroscience T32 Fellow	2016
Phi Beta Kappa Honor Society Inductee	2016
REU Summer Training in Alcohol Research Fellow	2014

**PUBLICATIONS**

Asterisks (\*) denote equal contributions. Daggers (†) denote corresponding author.

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**Research articles as first or corresponding author**

**Wright, W.J.<sup>†</sup>**, Hedrick, N.G., & Komiyama, T.<sup>†</sup> (2024) Distinct synaptic plasticity rules operate across dendritic compartments *in vivo* during learning. ***Science (Under Second Review)***

Hedrick, NG\*, **Wright, WJ\***, & Komiyama, T.<sup>†</sup> (2024) Local and global predictors of synapse elimination during motor learning. ***Science Advances***, 15;10(11). PMID: 38489360.

**Wright, W.J.\***, Graziane, N.M.\*, Neumann, P.A., Hamilton, P.J., Cates, H.M., Fuerst, L., Spenceley, A., Mackinnon-Booth, N., Iyer, K., Huang, Y.H., Shaham, Y., Schlüter, O.M., Nestler, E.J., & Dong, Y.<sup>†</sup> (2020) Silent synapses dictate cocaine memory destabilization and reconsolidation. ***Nature Neuroscience***, 23(1); 32-46.

**Wright, W.J.**, Schlüter, O.M., & Dong, Y.<sup>†</sup> (2017) A feedforward inhibitory circuit mediated by CB1-expression fast-spiking interneurons in the nucleus accumbens. ***Neuropsychopharmacology***, 42(5); 1146-1156.

### **Research articles as a contributing author**

Schall, T.A\*, Li, K.L.\*, Qi, X.\*, Lee, B., **Wright, W.J.**, Alpaugh, E.E., Zhao, R.J., Liu, J., Li, Q., Zeng, B., Wang, L., Huang, Y.H., Schlüter, O.M., Nestler, E.J., Nieh, E., & Dong, Y.<sup>†</sup> (2024) Temporal Dynamics of Nucleus Accumbens Neurons Launch Reward Seeking. **Nature Communications** (in press)

Teague, C\*, Picone, J\*, **Wright, W.J.**, Browne, C., Silva, G., Futamura, R., Minier-Toribio, A., Estil, M., Ramakrishnan, A., Martinez-Rivera, F., Godino, A., Parise, E., Lorsch, Z., Hyun Kim, J., Shen, L., Neve, R., Dong, Y., Nestler, E., Hamilton, P.J.<sup>†</sup> (2023) CREB binding at the Zfp189 promoter within medium spiny neuron subtypes differentially regulates behavioral and physiological adaptations over the course of cocaine use. **Biological Psychiatry**, 93(6); 502-511.

Lorsch, Z.S.\* , Hamilton, P.J.\* , Ramakrishnan, A., Parise, E.M., Salery, M., **Wright, W.J.**, Lepack, A., Mews, P., Issler, O., McKenzie, A., Zhou, X., Parise, L.F., Pirpinias, S.T., Torres, I.O., Kronman, H.G., Montgomery, S., Loh, Y-H.E., Labonte, B., Conkey, A., Symonds, A.E. Neve, R., Turecki, G., Maze I., Dong, Y., Zhang, B., Shen, L., Bagot, R.C., & Nestler, E.J.<sup>†</sup> (2019) Stress resilience is promoted by a Zfp 189-driven transcriptional network in prefrontal cortex. **Nature Neuroscience**, 22(9); 1413-1423.

Graziane, N.M., Sun, S.\*, **Wright, W.J.\***, Jang, D., Zheng, L., Huang, Y.H., Nestler, E.J., Wang, Y.T., Schlüter, O.M, & Dong, Y.<sup>†</sup> (2016) Opposing mechanisms mediate morphine- and cocaine-induced generation of silent synapses. **Nature Neuroscience**, 19(7); 915-925.

### **Reviews and Commentaries**

**Wright, W.J.** & Dong, Y (2021) Silent synapses in addiction memory and beyond. **Journal of Neuroscience**, 41(5); 9275-9285 (Review)

Schall, T.\*, **Wright, W.J.\***, & Dong, Y. (2021) Nucleus accumbens fast-spiking interneurons in motivational and addictive behaviors. **Molecular Psychiatry**, 26(1); 234-246. (Review)

**Wright, W.J.** & Dong Y. (2020) Psychostimulant-induced adaptations in nucleus accumbens glutamatergic transmission. **CSHL Perspectives in Medicine**, in press. (Invited review/book chapter)

**Wright, W.J.** & Dong, Y. (2018) Intrinsic excitability of cocaine-associated memories **Neuropsychopharmacology**, 43(4); 675-676. (Commentary)

**Wright, W.J.** & Dong, Y. (2017) Tipping the scales towards addiction. **Biological Psychiatry**, 81(11); 903-904. (Commentary)

**Wright, W.J.** & Dong, Y. (2016) NMDA receptors: “C”ing the culprits behind cocaine-induced metaplasticity, **Biological Psychiatry**, 80(9); 644-646. (Commentary)

### **CONFERENCE AND DEPARTMENT TALKS**

Max Planck Florida Institute NeuroMEETS. Jupiter, FL. Oct 2024

SfN Annual Meeting Nanosymposium. Chicago, IL. Oct 2024

NIDA Intramural Research Program. Virtual. Jun 2021

University of Pittsburgh Hearing Research Center. Pittsburgh, PA. Jan 2018

Neurobiology of Addiction GRC. Hong Kong. Jul 2017

## CONFERENCE POSTERS

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**Wright, W.J.**, Hedrick, N.G., & Komiyama, T. (2024) Compartment-specific functional synaptic organization and plasticity rules during learning. Synaptic Transmission Gordon Research Conference. Presented in Il Ciocco, Italy, July 2024

Hedrick, N.G., **Wright, W.J.**, Lu, Z., & Komiyama, T. (2022) Local and global functional determinants of spine elimination during learning. Society for Neuroscience Annual meeting. San Diego, CA, November 2022.

**Wright, W.J.**, Graziane, N.M., Neumann, P.A., Hamilton, P.J., Cates, H.M., Fuerst, L., Spenceley, A., Mackinnon-Booth, N., Iyer, K., Huang, H.Y., Shaham, Y., Schlüter, O.M., Nestler, E.J., & Dong, Y. (2019) Silent synapses dictate cocaine memory destabilization and reconsolidation. American College of Neuropsychopharmacology Annual meeting. Orland, FL, December 2019.

**Wright, W.J.**, Graziane, N.M., Neumann, P.A., Hamilton, P.J., Cates, H.M., Fuerst, L., Huang, Y.H., Shaham, Y., Schlüter, O.M., Nestler, E.J., & Dong, Y. (2018) Destabilization of a synaptic engram underlying drug-associated memories. Society of Neuroscience Annual meeting. San Diego, CA, November 2018.

**Wright, W.J.**, Yu, J., Yan, Y., Li, K-L., Wang, Y., Huang, Y.H., Urban, N.N., Nestler, E.J., Schlüter, O.M., & Dong, Y. (2017) Accumbens CB1-expressing fast-spiking interneurons promote cocaine seeking. Neurobiology of Addiction Gordon Research Conference. Hong Kong, July 2017.

Van Skike, C.E., **Wright, W.J.**, & Nixon, K. (2015) Effects of TSPO-ligand Ro5-4864 on hippocampal cell proliferation in a rat model of alcoholism. Research Society on Alcoholism. San Antonio, TX, June 2015.

**Wright, W.J.**, Davenport, M., & Hettes, S. (2014). Lateral hypothalamic glutamate receptors mediate predation of crickets by Sprague-Dawley Rats. Association of Southeastern Biologists, Spartanburg, SC, April 2014.

## TEACHING EXPERIENCE

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**Guest lecturer**, University of Pittsburgh 2019-2020

Course: *Neural Plasticity*

Responsibilities: Developed and delivered two 90-minute lectures covering classical hippocampal long-term potentiation and long-term depression, with detailed discussion of seminal papers

**Guest lecturer**, University of Pittsburgh 2017

Course: *Brain and Behavior*

Responsibilities: Developed and delivered two 50-minute lectures introducing classical and operant conditioning and the neurobiological mechanisms underlying these forms of learning.

**Graduate Teaching Assistant**, University of Pittsburgh 2017

Course: *Brain and Behavior*

Responsibilities: Held office hours and led review sessions for students on material covered in previous lectures.

## PROFESSIONAL and COMMUNITY SERVICE

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SfN Annual Meeting Nano Symposium Chair	2024
Journal Peer Reviewer (Independent) <i>International Journal of Neuropsychopharmacology</i>	2023-present
Biology Undergraduate and Master's Mentorship Program (BUMMP) Mentor	2023-present
CNUP Annual Retreat Committee Member	2019
Pittsburgh Regional Science and Engineering Fair Judge	2016-2018
CNUP School Brain Program Presenter	2016-2018

## MENTORING

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Zheyuan Liu, University of California, San Diego <i>Current:</i> Masters student, UCSD	2024-present
Bobbie Morales, University of California, San Diego <i>Current:</i> Research assistant, UCSD	2023-present
Boyang (Sophia) Zhou, University of California San Diego <i>Current:</i> Undergraduate student researcher UCSD	2022-present
Jiaru (May) Wang, University of California, San Diego <i>Current:</i> Undergraduate student researcher, UCSD	2022-2023
Emma Chen, University of California, San Diego <i>Current:</i> Undergraduate student research, UCSD	2022-2024
Terra Schall, Ph.D., University of Pittsburgh <i>Current:</i> Scientific Consultant	2018-2021
Kartik Iyer, University of Pittsburgh <i>Current:</i> Medical student, University of Pittsburgh	2018-2020
Natalie Mackinnon-Booth, University of Pittsburgh <i>Current:</i> Research assistant II, Boston Children's Hospital	2018-2020
Alexander Spenceley, University of Pittsburgh <i>Current:</i> Research technician, UCSD	2017-2019