

# Mitchell Morningstar, PhD

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## Education

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- **PhD**, Addiction Neuroscience 2019-2023  
Indiana University-Purdue University, Indianapolis (IUPUI)
- **Master of Science**, Psychology 2017-2019  
IUPUI
- **Bachelor of Science**, Neuroscience 2012-2016  
Indiana University  
Honors
- **Bachelor of Arts**, Cognitive Science 2012-2016  
Indiana University

## Major Research Experience

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### Postdoctoral Researcher, UNM

(PI: David Linsenbardt, PhD; Fernando Valenzuela, PhD)

2023 –

- Assessing anterior thalamus spatial encoding in rodent models of fetal alcohol spectrum disorder
- Analysis of functional Fos networks following fear conditioning in rodent models of fetal alcohol spectrum disorder
- Designed and implemented optical tomography methods based on existing open-source designs
- Analysis of rodent EEG data in mouse model of Alzheimer's
- Behavioral testing in spontaneous location recognition task
- Design and implementation of data processing pipelines for high throughput *in vivo* electrophysiology
- Design and implementation of Bonsai workflows for managing multiple streams of data

### Graduate Student, IUPUI (PI: Christopher Lapish, PhD)

2017 – 2023

- Identification of the acute effects of alcohol on awake-behaving rodent prefrontal cortex utilizing *in vivo* electrophysiological techniques.
- High-density silicon electrode *in vivo* recordings during a rodent delayed discounting task.
- Characterizing the acute effects of clozapine-n-oxide in rodent prefrontal cortex with *in vivo* electrophysiology.
- Spikesorting *in vivo* electrophysiology data using Mountainsort, spyking-circus, and Kilosort.
- High dimensional data analysis of spike trains.
- Data analysis for local field potentials (LFPs).
- Behavioral characterization of rodent first-time alcohol use with a chocolate Ensure-Alcohol mixture.
- Microdialysis quantifying brain EtOH concentration during first-time alcohol use in freely behaving rodents drinking a chocolate Ensure-Alcohol mixture.

- Gained proficiency in R, Python, and MATLAB.

#### Lab Manager, IU (PI: Laura Hurley, PhD)

2016 – 2017

- Utilized immunohistochemical techniques to quantify serotonergic fibers within the inferior colliculus of socially housed versus socially isolated mice. This included high-quality microscopy and imaging as well as staining.
- Estrous determination using histology and microscopy.
- Mouse dominance testing
- Built and tested carbon fiber microelectrodes for voltammetry.
- Performed surgeries for voltammetry implants.
- Assisted in mouse ultrasonic vocalization (USV) work.

#### Undergraduate Researcher, IU (PI: George Rebec, PhD)

2013 – 2016

- Designed and performed an undergraduate honor's thesis wherein we tested the effects of 2,5-Dimethoxy-4-iodoamphetamine (DOI) on cocaine-induced conditioned place preference as well as novel object recognition.
- Assisted in basic work which including operant learning, food restriction maintenance, and general handling. Built electrode bundles, learned basics of Plexon, DOS, electrophysiology surgeries, and histology.
- Learned to code in MedPC and then implemented a delayed non-match to sample task.

## Publications

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### *Published*

1. Ardinger, C. E., **Morningstar, M. D.**, Lapish, C. C., & Linsenbardt, D. N. (2025). Repeated alcohol drinking in mice is associated with bidirectional alterations in corticostriatal coherence. *Neuropharmacology*, 277, 110522. Advance online publication. <https://doi.org/10.1016/j.neuropharm.2025.110522>
2. **Morningstar, M. D.**<sup>+</sup>, Lopez, K. M., Mayfield, S. S., Almeida-Mancero, R. N., Marquez, J., Flores, A. M., Hafer, B. R., Estrada, E., Holtzman, G. A., Goranson, E. V., Reid, N. M., Aldrich, A. R., Ghatalia, D. V., Patel, J. R., Padilla, C. M., Chavez, G. J., Kelly-Roman, J., Bhakta, P. A., Valenzuela, C. F., & Linsenbardt, D. N. (2024). Connectivity of the neuronal network for contextual fear memory is disrupted in a mouse model of third-trimester binge-like ethanol exposure. *Alcohol, clinical & experimental research*, 10.1111/acer.15503.
3. White, S. M., **Morningstar, M. D.**, De Falco, E., Linsenbardt, D. N., Ma, B., Parks, M. A., Czachowski, C. L., & Lapish, C. C. (2024). Impulsive Choices Emerge When the Anterior Cingulate Cortex Fails to Encode Deliberative Strategies. *eNeuro*, 11(11), ENEURO.0379-24.2024.
4. **Morningstar, M. D.**, Timme, N. M., Ma, B., Cornwell, E., Galbari, T., & Lapish, C. C. (2024). Proactive Versus Reactive Control Strategies Differentially Mediate Alcohol Drinking in Male Wistars and P Rats. *eNeuro*, 11(3), ENEURO.0385-23.2024. <https://doi.org/10.1523/ENEURO.0385-23.2024>
5. Starski, P., **Morningstar, M. D.**, Katner, S. N., Frasier, R. M., De Oliveira Sergio, T., Wean, S., Lapish, C. C., & Hopf, F. W. (2024). Neural Activity in the Anterior Insula at Drinking

Onset and Licking Relates to Compulsion-Like Alcohol Consumption. *The Journal of neuroscience : the official journal of the Society for Neuroscience*, 44(9), e1490232023.

6. **Morningstar, M. D.**, Barnett, W. H., Goodlett, C. R., Kuznetsov, A., & Lapish, C. C. (2021). Understanding ethanol's acute effects on medial prefrontal cortex neural activity using state-space approaches. *Neuropharmacology*, 198, 108780.
7. De Falco, E, White, SM, **Morningstar, M.D.**, et al. (2021), Impaired cognitive flexibility and heightened urgency are associated with increased alcohol consumption in rodent models of excessive drinking. *Addiction Biology*.
8. **Morningstar, M.D.**, Linsenbardt, D.N. and Lapish, C.C. (2020), Ethanol Alters Variability, But Not Rate, of Firing in Medial Prefrontal Cortex Neurons of Awake-Behaving Rats. *Alcohol Clin Exp Res*.
9. Keesom SM, **Morningstar M.D.**<sup>+</sup>, Sandlain R, Wise BM, Hurley LM. (2018). Social isolation reduces serotonergic fiber density in the inferior colliculus of female, but not male, mice. *Brain Research*.

### ***In Prep***

1. **Morningstar, M.D.**, Acosta, G., Valenzuela, C.F., Clark, B.J., Linsenbardt, D.N. (2025) Unsupervised Phenotyping Reveals Disrupted Neural Firing Characteristics in the Anterior Thalamus and Surrounding Brain Regions Following Third-Trimester Equivalent Alcohol Exposure in Mice. *bioRxiv : the preprint server for biology*, <https://doi.org/10.1101/2025.06.02.657410>
2. Seamans, J. K., White, S., **Morningstar, M. D.**, Emberly, E., Linsenbardt, D., Ma, B., Czachowski, C. L., & Lapish, C. C. (2024). Neural basis of cognitive control signals in anterior cingulate cortex during delay discounting. *bioRxiv : the preprint server for biology*, 2024.06.07.597894.

+ Co-First Authored Publications

### **Invited Talks**

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1. Third trimester equivalent prenatal alcohol exposure leads to impaired contextual conditioning paralleled by blunted activity of the anteroventral thalamus. *CBRR Preclinical Core User Meeting*. University of New Mexico, Health Sciences Center. Albuquerque, NM. 12/02/2024.
2. Third trimester equivalent prenatal alcohol exposure leads to impaired contextual conditioning paralleled by blunted activity of the anteroventral thalamus. *Research Society on Alcohol*. Minneapolis, MN. 06/24/2024.
3. Low-dimensional neural features are critical intermediaries for understanding alcohol intoxication. University of New Mexico, Health Sciences Center. Albuquerque, NM. 09/15/2022.
4. Ethanol Alters Variability, But Not Rate, of Firing in Medial Prefrontal Cortex Neurons of Awake-Behaving Rats. *Alcohol Research Center Trainee Day*. Zoom. 09/19/2021.

### **Conference Poster Abstracts**

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1. **M.D. Morningstar**, G. Acosta, C.F. Valenzuela, B. Clark, D. N. Linsenbardt. (2025). Developmental alcohol exposure disrupts allocentric cue encoding by anterior thalamus neural activity and modulation of open field behavior in a mouse model of third-trimester alcohol exposure. *Brain and Behavioral Health Institute*.
2. **M.D. Morningstar**, D.N. Linsenbardt, K.M. Lopez, C.F. Valenzuela. (2024). Third Trimester Equivalent Prenatal Alcohol Exposure Leads to Impaired Contextual Conditioning Paralleled by Blunted Activity of the Anteroventral Thalamus. *Research Society for Alcohol*.
3. **M.D. Morningstar**, D.N. Linsenbardt, K.M. Lopez, C.F. Valenzuela. (2024). Third Trimester Equivalent Prenatal Alcohol Exposure Leads to Impaired Contextual Conditioning Paralleled by Blunted Activity of the Anteroventral Thalamus. *GRC. Alcohol and the Nervous System*.
4. **M.D. Morningstar**, N.M. Timme, C.C. Lapish (2023). Proactive versus Reactive Control Strategies Differentially Mediate Alcohol Drinking in Wistar and P rats. *Research Society for Alcoholism*.
5. **M.D. Morningstar**, N.M. Timme, C.C. Lapish. (2022). Rodents Deploy Flexible Strategies in a Pavlovian Conditioned Alcohol Seeking Task. *GRC. Alcohol and the Nervous System*.
6. **M.D. Morningstar**, N.M. Timme, C.C. Lapish. (2022). Rodents Deploy Flexible Strategies in a Pavlovian Conditioned Alcohol Seeking Task. *Research Society for Alcoholism*.
7. Starski, P., **Morningstar, M.**, Sandler, R., Sergio, T. D. O., Lapish, C., & Hopf, F. (2021). Anterior Insular Cortex Activity Encodes Aversion-Resistant Alcohol Consumption. *Neuropsychopharmacology*.
8. **M.D. Morningstar**, C.C. Lapish. (2020). Differential Effects of Ethanol on Neural Activity in Medial Prefrontal Cortex of Behaving Versus Anesthetized Rats. *Research Society for Alcoholism*.
9. S.M. White, E. De Falco, **M.D. Morningstar**, D.N. Linsenbardt, C.L. Czachowski, C. C. Lapish. (2020). Prospective Strategies in Dorsal Medial Prefrontal Cortex Population Activity of Wistar Rats During Delay Discounting. *Research Society for Alcoholism*.
10. E. de Falco, **M. Morningstar**, S. M. White, D. N. Linsenbardt, C. C. Lapish. (2019). Neural population activity in the rat medial prefrontal cortex underlying proactive behavior in a delay discounting task. *Society for Neuroscience*.
11. **M.D. Morningstar**, C.C. Lapish. (2019). Impact of Acute Ethanol Injections on Medial Prefrontal Cortex Neural Activity. *Society for Neuroscience*.
12. **Morningstar M.D.**, Keesom S.M., Hurley L.M. (2018). Sex Difference in Inferior Colliculus Serotonin Fibers in Response to Varying Social Housing Conditions. *Animal Behavior Conference*.
13. **Morningstar, M.D.**, Rebec, G.V. (2016). The Effects of the Hallucinogen DOI on the Novel Object Recognition Task and Conditioned Place Preference Within the Rat Model. *Indiana University Honors Thesis Banquet and Poster Session*.

## Workshops

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1. **Spikesorting with SpikeInterface** – University of New Mexico (07/26/2024; leader)
2. **Allen Brain Institute Neuropixels Workshop** – Allen Brain Institute (06/2024; attendee)
3. **Nencki School of Ideas in Neuroscience** – Nencki Institute of Experimental Biology (06/2022; attendee)

4. **MountainSort User Workshop** – Center for Computational Biology, Flatiron Institute  
(05/2018; attendee)

## Teaching

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| 1. <b>Graduate Student Instructor, IUPUI</b><br><i>Course: Statistics Lab</i>                     | Spring 2019 |
| 2. <b>Graduate Teaching Assistant, IUPUI</b><br><i>Course: Ethics and Diversity in Psychology</i> | Spring 2019 |
| 3. <b>Graduate Teaching Assistant, IUPUI</b><br><i>Course: Capstone in Psychology</i>             | Spring 2018 |
| 4. <b>Graduate Teaching Assistant, IUPUI</b><br><i>Course: Capstone in Neuroscience</i>           | Fall 2017   |
| 5. <b>Undergraduate Discussion Leader, IU</b><br><i>Course: Human Sexuality</i>                   | Spring 2015 |

## Honors & Awards

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| 1. <b>Paul J. McKinley Award, IUPUI</b>                       | 2022        |
| 2. <b>Student Merit Award, Research Society on Alcoholism</b> | 2019        |
| 3. <b>Honors in Neuroscience, IU</b>                          | 2016        |
| 4. <b>Executive Dean's List, IU</b>                           | 2014 - 2016 |
| 5. <b>Diversity Program of the Month, RLAC, IU</b>            | 2015        |
| 6. <b>Resident Assistant of the Month, IU</b>                 | 2013        |
| 7. <b>IU Excellence Scholarship, IU</b>                       | 2012        |
| 8. <b>National German Examination – Silver Medal, ATG</b>     | 2010        |

## Related Professional Experience

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| 1. <b>Community Manager, IU Bloomington</b>  | 2015 - 2016 |
| 2. <b>Resident Assistant, IU Bloomington</b> | 2013 - 2015 |

## Professional Associations

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- Research Society on Alcohol
- Society for Neuroscience