Zhe Zhao Ph.D.
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EDUCATION

Oct. 2015 - Mar. 2020 **Ph.D. student** in Neuroscience, University of Bordeaux, France
"Endocannabinoids and Neuroadaptation" Group,
Supervisor: Giovanni Marsicano D.V.M., Ph.D.
Neurocentre Magendie, Inserm 1215, Bordeaux Neurocampus.

Sep. 2007 - Jun. 2011 **Undergraduate** in Biological Engineering, College of food science and technology, Agricultural University of Hebei, China.

WORK EXPERIENCE

Jan. 2021 - Present **Postdoc** at the Max Planck Florida Institute for Neuroscience, Jupiter, FL

Apr. 2020 - Dec. 2020 **Postdoc** in "Neural circuits of anxiety" Group and "Endocannabinoids and Neuroadaptation" Group,
Supervisors: Anna Beyeler Ph.D. and Giovanni Marsicano D.V.M., Ph.D.
NeuroCentre Magendie, Inserm 1215, University of Bordeaux.

Dec. 2011 - Oct. 2015 **Technician** in **Imaging Facility**, supervised by Prof. Cheng Zhan, National Institute of Biological Sciences, Beijing, China.

EXPERTISE

Neuroanatomy: Neural circuit mapping, single **neuron morphology analysis** by using **Imaris.**

Neural Dynamics and Perturbations: Optogenetics, Chemogenetics, Drug or Virus Delivery, Fiber Photometry, ***In/ex vivo* Calcium Imaging**, *In/ex vivo* Electrophysiology.

Cannabinoid and Leptin Receptors: Pharmacological and genetic manipulation of type-1 cannabinoid receptors (CB1) and leptin receptors; studying their role on synaptic plasticity.

Animal Behavioral Essays: Feeding/drinking behavior, anxiety-like behavior, nose poke/auditory cue-associated operant behavior, context/cue-induced overconsumption, restraint stress.

Light Microscopy: Advanced **application** of confocal and two-photon microscopes (Zeiss, Leica, Nikon, Perkin Elmer, etc.) on various biological samples (cell culture, brain sections, spinal cord, skin, lung, fly eyes, etc.); **maintaining** microscopes, e.g., Mergury Arc Lamp replacement and cleaning objective lens; **biological sample preparation**, e.g., transcardiac perfusion of the mice, vibratome, cryostat, immunohistochemistry (IHC), in situ fluorescence hybridization (FISH).

Data Analysis: Advanced computational models (Gaussian Naïve Bayes Classifier, Hidden Markov Model, K-Nearest Neighbors, etc.) for the analysis of animal behavior (e.g., eat, drink, animal posture, etc.) and **neural activity** (**calcium imaging by Inscopix miniscope** and single-unit electrophysiological recording) by using **Matlab** and **Python**.

Electrical Engineering: Using microprocessors (**Arduino, Teensy, Bpod**) to build specific chambers, e.g. feeding/drinking behavioral chamber (INGEsT, Zhao, et al. bioRxiv 2024).

RESEARCH INTEREST

My current research focuses on neuronal, molecular, and circuit mechanisms of ingestive behavior mediated by internal body states, e.g. hunger and thirst, and these states together with external stimuli (novel context, sound/light cues, tastes, odors, etc.). I am using a novel two-alternative forced choice task coupled with **advanced *in vivo* calcium imaging** approach to investigate neural dynamic mechanisms underlying the integration of internal states and external factors.

PUBLICATIONS (H-index: 6, Citation count: 764)

- **Zhao Z.,** Anthony A. S., Xu B., Srigiriraju A., Kidd M., McKie I., Holford T., Bolton M., Stern A. S. (To submit). Leptin provides interoceptive inputs to the insular cortex to control feeding.
- **Zhao Z.,** Stern A. S. Homeostatic feeding in hedonic centres. ***Nat Metab.*** 2024 Aug;6(8):1433-1434. doi: 10.1038/s42255-024-01089-6. PMID: 39147932.
- **Zhao Z.*,** Xu B.*, Loomis L. C., Anthony A. S., McKie I., Srigiriraju A., Bolton M., Stern A. S. (2024). INGEsT: An Open-Source Behavioral Setup for Studying Self-motivated Ingestive Behavior and Learned Operant Behavior. **bioRxiv** 584229 [preprint]. March 10, 2024. Available from: doi.org/10.1101/2024.03.10.584229v1.
- **Zhao Z.,** Covelo A., Couderc Y., Mitra A., Varilh M., Wu Y., Jacky D., Fayad R., Cannich A., Bellocchio L., Marsicano G. Beyeler A. Cannabinoids regulate an insular circuit controlling water intake in. ***Current Biology,*** 2024 (IF: 8.1).
- **Zhao Z.,** Soria-Gómez E., Varilh M., Julio-Kalajzic F., Cannich A., Castiglione A., Vanhoutte L., Duveau A., Zizzari F., Beyeler A., Cota D., Bellocchio L., Busquets-Garcia A., Marsicano G. A novel mechanism for top-down control of water intake. ***Current Biology***, 2020 (IF: 10.834).
- Soria-Gómez E., Zottola P.C.A., Mariani, Y., Desprez, T.,…Varilh M., Cannich A., Redon B., **Zhao Z.,**…Marsicano G., Bellocchio L., Subcellular specificity of cannabinoid effects in striatonigral circuits. ***Neuron***, 2020 (IF: 17.173).
- Oliveira da Cruz J. F., Busquets-Garcia A., **Zhao Z.,** Varilh M., Bellocchio L., Robin L., Marsicano G., Soria-Gómez E. Specific hippocampal interneurons shape consolidation of recognition memory. ***Cell Reports***, 2020 (IF: 9.423).
- Martin-Fernandez M., Jamison S., Robin L., **Zhao Z.**, Martin D., Aguilar J., Benneyworth M., Marsicano G., Araque A. Synapse-specific astrocyte gating of amygdala-related behavior**.** ***Nature Neuroscience***, 2017 (IF:17.839).
- **Zhao Z.*,** Wang L.*, Gao W.*, Hu F., Zhang J., Ren Y., Lin R., Feng Q., Cheng M., Ju D., Chi Q., Wang D., Song S., Luo M., Zhan C. A central catecholaminergic circuit controls blood glucose levels during stress. ***Neuron***, Volume 95, Issue 1, p138–152.e5, 5 July 2017 (IF: 14.318, **Featured article**).
- Wang D., He X., **Zhao Z.**, Feng Q., Lin R., Sun Y., Ding T., Xu F., Luo M., Zhan C. Whole-brain mapping of the direct inputs and axonal projections of POMC and AgRP neurons. ***Frontiers in Neuroanatomy*** 9:40, 2015 (IF: 3.26).

INVITED PRESENTATIONS

- Tri Institutional Seminal Series (MPFI, UF Scripps, FAU), April 16th 2024, Jupiter, FL, US.
- The Florida Consortium on the Neurology of Cognition, Annual Meeting 2023, May 11-12 2023, Jupiter, Florida, US.
- Top-down control of water intake by the endocannabinoid system. NeuroCentre Magendie Symposium, Boredeaux, France, September 26th 2019.
- Top-down control of water intake by the endocannabinoid system. 17th Synapse Day Meeting, Boredeaux, France, September 17th 2019.

INVITED PRESENTATIONS

- Role of the cortical cannabinoid receptor type 1 in the control of water intake. Xi'an, China, September 29th 2018.
- Cannabinoids, the relevance to central nervous system and pain. Modena, Italy, January 20th 2018.

CONFERENCE/SCHOOL ATTENDED

2025

- Keystone conference, Interoception: Neural Sensing and Control of Organ Function, April 22 – 24, 2025, Allen Institute, Seattle, WA, US

2024

- 88th CSHL Symposium: Brain Body Physiology, May 29-June 2 2024, NY, US.
- UF Scripps Research Fest, May 10, 2024, Jupiter, FL, US.
- Tri Institutional Seminal Series (MPFI, UF Scripps, FAU), April 16 2024, Jupiter, FL, US.

2023

- SSIB the 30th Annual Meeting, July 11-15 2023, Portland, Oregon, US.
- The Florida Consortium on the Neurology of Cognition, Annual Meeting 2023, May 11-12 2023, Jupiter, Florida, US.
- MPFI Sunposium 2023, March 6-8 2023, West Palm Beach, Florida, US.

2022

- Neuromatch Academy-Deep Learning (online course), July 11-29 2022

2021

- Neuromatch Academy-Computational Neuroscience (online course), July 5-23 2021

2019

- NeuroCentre Magendie Symposium, September 26th 2019, Boredeaux, France.
- 17th Synapse Day Meeting, September 17th 2019, Boredeaux, France.

2018

- Society for neuroscience 48th annual meeting, November 3-7 2018, San Diego, CA
- New therapeutic strategies for chronic pain: from Botulinum Toxin to Medical Cannabis, January 20th 2018, Modena, Italy.

2017

- Frontier in Neurophotonics, October 15-18, 2017, Bordeaux, France.
- 4th Bordeaux neurocampus conference, September 27-29, 2017, Bordeaux, France.
- Super-resolution in photonic microscopy, May 30-June 1, 2017, Bordeaux, France.
- NeuroFrance, May 17-19, 2017, Bordeaux, France.

2016

- 3rd Bordeaux neurocampus conference, September 28-30, 2016, Bordeaux, France.
- The Catania international school in neuroscience "Cannabinoid receptors: their role on physiology and pathology", Noto, Italy, July 11-15 2016.

AWARDS AND HONORS

2023, Travel Award, MPFI Postdoctoral Travel Grant for SSIB Annual Conference, Portland, US

2019, Travel Award, Sun Yat-sen University Young Scholars Seminar, Guangzhou, China

2018, Travel Award, Silk Road Young Scholars Seminar, Xi'an, China

2016, Travel Award, Catania International School in Neuroscience, Noto, Italy, July 11-15, 2016

2015 – 2019, Graduate Scholarship, China Scholarship Council (CSC)

2014, Second Prize for poster contest, National Institute of Biological Sciences, Beijing, Symposium

MEMBERSHIPS

2024 – present	Member, Executive Committee, Florida Consortium on the Neurobiology of Cognition
2024 – present	Chair, Trainee Executive Committee, Florida Consortium on the Neurobiology of Cognition
2024 – present	Member, American Heart Association
2023 – 2024	Member, the Society for the Study of Ingestive Behavior
2023 – present	Selection Committee Member, MPFI NeuroMEETS talk series
2023	Committee Member, MPFI Sunposium Conference 2023
2022 – present	Member, MPFI Network for Women in Science
2018	Member, Society of Neuroscience (SfN)

PEER REVIEWER FOR JOURNALS

Scientific Reports, Frontiers in Endocrinology