Michael Totty, PhD

Postdoctoral Fellow · The Lieber Institute for Brain Development

855 N. Wolfe Street, Baltimore, MD 21205

michael.totty@libd.org | https://github.com/MicTott | @MicTott

Education

Texas A&M University — *College Station, Texas*

PhD Neuroscience — *2017 - 2022*

- Advisor: Dr. Stephen Maren

University of Tennessee — *Knoxville, Tennessee*

BS Biomedical Engineering — *2012 - 2016*

- Advisor: Dr. Subimal Datta, *Sleep and behavioral neuroscience*
- Advisor: Dr. Eric Wade, *Robotics and sensing*

Professional Experience

2022-Pres **Postdoctoral Fellow**, Lieber Institute for Brain Development
Investigating the molecular and microcircuit mechanisms underlying traumatic memories across species.

2017-2022 **Graduate Research Assistant**, Texas A&M Institute for Neuroscience
Investigating prefrontal-hippocampal oscillatory dynamics during extinction memory retrieval.

2015-2017 **Undergraduate Research Assistant**, University of Tennessee Medical Center
Studied sleep-dependent consolidation of fear extinction memories.

2015 **Undergraduate Research Assistant**, University of Tennessee
Developed a proof-of-concept method for classifying activities of daily living.

Publications

*# equal contribution; * mentored undergraduate.*

Preprints and In Prep

3. **Totty MS**, Peters S*, Tuna T, and Maren S. "Fiber photometric recordings of the thalamic nucleus reuniens activity during Pavlovian fear conditioning and extinction in male and female rats." *In prep.*
2. Tucker A, Baltazar A, Jang J, Singletary B, Vo K, Moses J, Letchuman S, Pitonak M, Aceves M, **Totty MS**, Maren S, McCreedy D, Dulin JN. "Synaptic Connectivity of Neural Progenitor Cells with Spinal Locomotor Circuits after Spinal Cord Injury." *In prep.*
1. **Totty MS**, Ramanathan K, Jin J, Peters S*, and Maren S (2022). "Thalamic nucleus reuniens coordinates prefrontal-hippocampal synchrony to suppress extinguished fear." *bioRxiv.* DOI: 10.1101/2022.11.11.516165

Published Articles

8. **Totty MS** and Maren S. "Neural oscillations in Aversively Motivated Behavior (2022)." *Frontiers in Behavioral Neuroscience.* DOI: 10.3389/fnbeh.2022.936036
7. Binette AN#, **Totty MS#**, Maren S (2022). "Sex differences in the immediate extinction deficit and renewal of extinguished fear in rats." *PLoS One.* DOI: 10.1371/journal.pone.0264797
6. Liu J#, **Totty MS#**, Melissari L, Bayer H, Maren S (2022). "Convergent coding of recent and remote fear memory in the basolateral amygdala." *Biological Psychiatry.* DOI: 10.1016/j.biopsych.2021.12.018
5. **Totty MS**, Warren N, Huddleston I*, Ramanathan K, Ressler R, Oleksiak C, Maren S (2021). "Behavioral and brain mechanisms mediating conditioned flight behavior in rats." *Scientific Reports*. DOI: 10.1038/s41598-021-87559-3

4. Giustino TF, Ramanathan KR, **Totty MS**, Miles OM, and Maren S (2020). "Locus coeruleus norepinephrine drives stress-induced increases in basolateral amygdala firing and impairs extinction learning." *Journal of Neuroscience*. DOI: 10.1523/JNEUROSCI.1092-19.2019

3. **Totty MS**, Payne M, Maren S (2019). "Event boundaries do not cause the immediate extinction deficit after Pavlovian fear conditioning in rats." *Scientific Reports*. DOI: 10.1038/s41598-019-46010-4

2. **Totty MS**, Chesney LA, Geist PA, Datta S (2017). "Sleep-dependent oscillatory synchronization: a role in fear memory consolidation." *Frontiers in Neural Circuits*. DOI: 10.3389/fncir.2017.00049

1. **Totty MS** and Wade E (2017). "Muscle Activation and Inertial Motion Data for Non-Invasive Classification of Activities of Daily Living." *IEEE Transactions on Biomedical Engineering*. DOI: 10.3389/fncir.2017.00049

Awards, Fellowships, & Grants

2021	**Travel Award**, Texas A&M Institute for Neuroscience	*$ 600*
	Travel Award, Dept. Psych. and Brains Sciences, TAMU	*$ 500*
2019	**3rd Place Poster Award**, Texas A&M Chapter of the Society for Neuroscience	*$ 100*
	Travel Award, Texas A&M Institute for Neuroscience	*$ 600*
	Travel Award, Dept. Psych. and Brains Sciences, TAMU	*$ 500*
2018	**Travel Award**, Texas A&M Institute for Neuroscience	*$ 600*
	Travel Award, Dept. Psych. and Brains Sciences, TAMU	*$ 500*
2017	**2nd Place Poster Award**, Texas A&M Chapter of the Society for Neuroscience	*$ 200*
	Travel Award, Texas A&M Institute for Neuroscience	*$ 600*
	Travel Award, Dept. Psych. and Brains Sciences, TAMU	*$ 500*

Selected Presentations

Talks

5. "Thalamic Nucleus Reuniens Coordinates Prefrontal-Hippocampal Synchrony to Suppress Extinguished Fear." Plexon: Neuroscience 2023 Data blitz, Virtual. January 2023.

4. "Thalamic Control of Prefrontal-Hippocampal Synchrony Mediating Fear Memory Suppression." Gordon Research Seminar: Thalamocortical Interactions, Lucca, Italy. Fall 2022.

3. "The nucleus reuniens mediates the retrieval of extinction memories via prefrontal-hippocampal synchronization." TAMIN Seminar Series, Texas A&M University. Spring 2022.

2. "Oscillatory dynamics underlying the retrieval of extinction memories and the role of the nucleus reuniens." BCN Graduate Seminar Series, Texas A&M University. Fall 2021.

1. "Does stress or event segmentation account for the immediate extinction deficit after conditioning in rodents?" TAMIN Annual Symposium, Texas A&M University. April 2019.

Posters

17. **Totty MS**, Ramanathan K, Peters S, Maren S. "Oscillatory dynamics underlying the retrieval of extinction memories and the role of the thalamic nucleus reuniens." Gordon Research Conference: Thalamocortical Interactions. February 2022

16. **Totty MS**, Ramanathan K, Peters S, Maren S. "Oscillatory dynamics underlying the retrieval of extinction memories and the role of the thalamic nucleus reuniens." Society for Neuroscience. November 2022

15. **Totty MS**, Ramanathan K, Maren S. "The nucleus reuniens of the thalamus is necessary for both the retrieval of recent extinction memories and prefrontal-hippocampal theta synchrony." Society for Neuroscience. November 2021

14. Liu J, **Totty MS**, Melissari L, Maren S. "Basolateral amygdala mediates retrieval of both recent and remote fear memories." Society for Neuroscience. November 2021.

13. **Totty MS**, Ramanathan K, Maren S. “The nucleus reuniens of the thalamus is necessary for both the retrieval of recent extinction memories and prefrontal-hippocampal theta synchrony.” Pavlovian Society. November 2021
12. **Totty MS**, Ramanathan K, Maren S. “The nucleus reuniens of the thalamus is necessary for both the retrieval of recent extinction memories and prefrontal-hippocampal theta synchrony.” IBRO-RIKEN CBS Summer Program. June 2021
11. **Totty MS**, Ramanathan K, Maren S. “The role of the nucleus reuniens in coordinating prefrontal-hippocampal synchrony during the expression of fear and extinction memories.” Society for Neuroscience: Global Connectome. January 2021.
10. Liu J, **Totty MS**, Maren S. “Optogenetic inhibition of basolateral amygdala principle neurons attenuates the retrieval of both recent and remote cued fear memories in rats.” Society for Neuroscience: Global Connectome. January 2021.
9. **Totty MS**, Warren N, Ressler R, Ramanathan K, Maren S. “The bed nucleus of the stria terminalis regulates context-dependent flight behavior.” Society for Neuroscience. October 2021.
8. **Totty MS**, Warren N, Ressler R, Ramanathan K, Maren S. “Neural circuits mediating context-dependent flight behavior in rats.” Pavlovian Society. October 2019.
7. **Totty MS**, Warren N, Ressler R, Ramanathan K, Maren S. “The bed nucleus of the stria terminalis regulates context-dependent flight behavior.” Gordon Research Conference: Amygdala Function in Emotion, Cognition, and Disease. August 2019.
6. **Totty MS**, Warren N, Ressler R, Ramanathan K, Maren S. “Contextual regulation of flight behavior in rats is mediated by the bed nucleus of the stria terminalis.” UT Austin Conference on Learning and Memory. April 2019.
5. **Totty MS** and Maren S. “Does stress or event segmentation account for the immediate extinction deficit?” Society for Neuroscience. November 2018.
4. Giustino TF, **Totty MS**, and Maren S. “Propranolol stabilizes shock-induced increases in spike firing in the basolateral amygdala: implications for the immediate extinction deficit.” Society for Neuroscience. November 2018.
3. **Totty MS**, Chesney LA, Geist PA, Datta S. “The role of sleep-dependent neuronal network synchronization in fear memory consolidation.” Society for Neuroscience. November 2017.
2. Geist PA, Barnes A, Dulka DN, **Totty MS**, Datta S. “The effects of BDNF on local EEG patterns and behavioral testing.” Society for Neuroscience. November 2017.
1. **Totty MS** and Wade E. “Forearm EMG activation classifies activites of daily living.” Biomedical Engineering Society Annual Meeting. October 2015.

Teaching Experience

Spring 2020	**Elementary Statistics for Psychology**, Teaching Assistant	*Texas A&M University*
Spring 2021	**Introduction to Drug Delivery**, Virtual Guest lecture	*University of Tennessee*

Mentoring

#mentored undergraduate thesis

2021-Pres	**Tugce Tuna**, Graduate researcher, Texas A&M University
2019-Pres	**Shaun Peters**, Undergraduate researcher, Texas A&M University
2019-2020	**Matthew Alwood**, Graduate researcher, Texas A&M University
2018-2019	**Isabella Huddleston#**, Undergraduate researcher, Texas A&M University

Outreach and Professional Development

Service and Outreach

2020-2021	**Outreach Committee Member**, Building Researchers And Innovators in Neuroscience and Society (BRAINS)
2019-2021	**Webmaster**, Texas A&M Institute for Neuroscience
2019-2020	**Guest Speaker**, “Camp Dream, Speak, Live” for children who stutter
2019	**Oral Presentation Judge**, Student Research Week, Texas A&M University
2019	**Volunteer and Speaker**, BRAIN Day, Henderson Elementary School
2016-2017	**Guest Speaker**, “Volunteer Your Voice” camp for children who stutter

Professional Development

2021	**IBRO-RIKEN CBS Summer Program**, RIKEN Center for Brain Science
2020	**Reviewer Mentor Program**, Journal of Neuroscience

Peer Review

eNeuro
Journal for Emerging Investigators

Professional Memberships

Pavlovian Society
Society for Neuroscience: Texas A&M Local Chapter
Society for Neuroscience