

CURRICULUM VITAE

WILLIAM D. MARKS, Ph.D.

Department of Neuroscience
 UT Dallas School of Behavioral and Brain Sciences
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EDUCATION AND TRAINING

Postdoctoral Fellowship, Neural circuitry, University of Texas Southwestern Medical Center, Dallas, TX	2018-2023
UT-STEMS Teaching Fellowship Program, UT Southwestern Medical Center, Dallas, TX / University of Texas at Dallas, Richardson, TX	2018-2019
Ph.D., Neuroscience, Virginia Commonwealth University, Richmond, VA	2017
M.A., Biology, State University of New York College at Buffalo, Buffalo, NY	2012
B.S., Biology, Minor Psychology, Franciscan University of Steubenville, Steubenville, OH	2009

PROFESSIONAL POSITIONS

Assistant Professor of Instruction in Neuroscience, University of Texas at Dallas Department of Neuroscience, Richardson, TX	2023-present
Adjunct Instructor, University of Texas at Dallas Honors College, Richardson, TX	2019
Graduate Research Associate, Virginia Commonwealth University Department of Pharmacology and Toxicology, Richmond, VA	2012-2017
Teaching Assistant, SUNY Buffalo College at Buffalo Department of Biology, Buffalo, NY	2011-2012
Graduate Research Assistant, SUNY College at Buffalo Department of Biology, Buffalo, NY	2010-2012
Substitute Teacher, St. Mary's High School Lancaster, NY	2009-2011
Resident Assistant, Franciscan University of Steubenville Student Life, Steubenville, OH	2007-2009

TEACHING EXPERIENCE

Adjunct Instructor University of Texas at Dallas <i>Readings in Sensation and Experience (HONS 3199.H11); Instructor of Record, course designer</i>	Spring 2019
Guest Lecturer University of Texas Southwestern Medical Center Dept. of Psychiatry <i>Child Psychiatry Fellowship Training Program</i> <i>Lecture: Neuroanatomy</i> <i>Lecture: Animal models in depression research</i>	Spring 2019 March 2019 April 2019
Guest Lecturer Virginia Commonwealth University	2014-2017

*Drug Biology (BIOL 491)**Lecture: Central Nervous System*

Fall 2017

Lecture: Central Nervous System

Fall 2016

Lecture: Central Nervous System

Fall 2015

Lecture: Opioid Pharmacology

Fall 2014

Teaching Assistant

2011- 2012

State University of New York College at Buffalo

Introduction to Organismal Biology and Diversity Lab (Bio 212, 2 sections)

Spring 2012

Introduction to Organismal Biology and Diversity Lab (Bio 212, 2 sections)

Fall 2011

Introduction to Cell Biology and Genetics Lab (Bio 211)

Spring 2011

Comparative Animal Physiology Lab (Bio 405)

Spring 2011

EXTRAMURAL FUNDING

• F32 MH122082, NIMH, Total Costs: \$132,756.00

PI: Marks, WD

7/1/20 - 6/30/22

*Space-time processing in the hippocampus; behavioral paradigms and functional mechanism of integration***MANUSCRIPTS AND PREPRINTS**

Marks WD, Terranova JI, Yamamoto N, Kitamura T, Ogawa SK. A novel pathway from MEC layer VI to the hippocampus activates the interneuron network to differentially regulate spatial, temporal, and contextual memory acquisition. *Manuscript in preparation*

Yokose J, **Marks WD**, Kitamura T. Neuronal ensembles crucial for visual self-image in mouse hippocampus. *Submitted to Neuron— in Revision.*

PEER REVIEWED PUBLICATIONS

(*h-index* = 7; *Shared first-authorship, **Highlighted paper, NIDA-Basic Research in HIV and drug abuse, July 2022)

Lark ARS, Silva LK, Nass SR, Marone M, Ohene-Nyako M, Ihrig TM, **Marks WD, McQuiston AR, Knapp PE, Hauser KF. (2022) Dynamic shifts in dopamine D1 and D2 receptor-expressing striatal medium spiny neuron excitability and differential sensitivity to HIV-1 Tat and morphine. *Cellular and Molecular Neurobiology*. Doi: 10.1007/s10571-022-01232-5

Marks WD, Yokose J, Kitamura T, Ogawa SK. (2022). Neuronal ensembles organize activity to generate contextual memory. *Front Behavioral Neurosci*. Vol 16.

Terranova JI, Yokose J, Osanai H, **Marks WD**, Yamamoto J, Ogawa SK, Kitamura T. (2022) Hippocampal-amygdala memory engram circuits govern experience-dependent observational fear. *Neuron*. Doi: 10.1016/j.neuron.2022.01.019

Yokose J*, **Marks WD***, Yamamoto N, Ogawa SK, Kitamura T (2021) Entorhinal cortical island cells regulate temporal association learning with long trace period. *Learning and Memory*, 28(9): 319-328.

Marks WD, Paris JJ, Barbour AJ, Moon J, Carpenter VJ, McLane VD, Lark ARS, Nass SR, Zhang J, Yarotsky V, McQuiston AR, Knapp PE, Hauser KF (2021) HIV-1 tat and morphine differentially disrupt pyramidal structure and function and spatial learning in hippocampal area CA1: Continuous versus interrupted morphine exposure. *eNeuro*. DOI: 10.1523/ENEURO.0547-20.2021.

- Marks WD**, Yamamoto N, Kitamura T (2021). Complementary roles of differential medial entorhinal cortex inputs to the hippocampus for the formation and integration of temporal and contextual memory. *Eur J Neurosci*. doi: 10.1111/ejn.14737. PMID: 32277786
- Marks WD**, Osanai H, Yamamoto J, Ogawa SK, Kitamura T (2019). Novel nose poke-based temporal discrimination tasks with concurrent in vivo calcium imaging in freely moving mice. *Mol Brain*. 12(1):90. PMID: 31694671
- Schier CJ*, **Marks WD***, Paris JJ, Barbour AJ, McLane VD, Maragos WF, McQuiston AR, Knapp PE, Hauser KF (2017). HIV-1 Tat causes selective vulnerability of D2-expressing medium spiny neurons. *J Neurosci*. 37(23):5758-5796. PMID: 28473642
- Marks WD**, Paris JJ, Schier CJ, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2016) HIV-1 Tat causes cognitive deficits and selective loss of parvalbumin, somatostatin, and neuronal nitric oxide synthase expressing hippocampal CA1 interneuron subpopulations. *J Neurovirol*. 22(6): 747-762. PMID: 27178324
- Fitting S, Knapp PE, Zou S, **Marks WD**, Bowers MS, Akbarali HI, Hauser KF (2014) Interactive HIV-1 Tat and morphine-induced synaptodendritic injury is triggered through focal disruptions in Na⁺ influx, mitochondrial instability, and Ca²⁺ overload. *J Neurosci*. 34(38): 12850-64. PMID: 25232120 PMCID: PMC4166164
- Marks WD**, Skerrett IM (2013) Role of amino terminus in voltage gating and junctional rectification of Shaking B innexins. *J Neurophysiol*. 111(6): 1383-95. PMID: 24381032

BOOK CHAPTERS

- Yamamoto N, **Marks WD**, Kitamura T (2021) Cell-Type-Specific Optogenetic Techniques Reveal Neural Circuits Crucial for Episodic Memories. In: Yawo H, Kandori H, Koizumi A, Kageyama R (eds) Optogenetics. Advances in Experimental Medicine and Biology, vol 1293. Springer, Singapore.

INVITED TALKS

- Marks WD** (Mar 2023). Circuit disruptions in the HIV associated neurocognitive disorders. Special Seminar. Binghamton University, Binghamton, NY.
- Marks WD** (Feb 2023). Circuit disruptions in the HIV associated neurocognitive disorders. Special Seminar. Appalachian State University, Boone, NC.
- Marks WD** (Nov 2022). HIV induced disruption of neural circuitry. Special Seminar. Wittenberg University Dept. of Psychology, Springfield, OH.
- Marks WD** (Apr 2022). Bioelectric activity of the brain. Invited lecture. Dallas chapter of the Institute of Electrical and Electronics Engineers Consultant Network, Dallas, TX.
- Marks WD** (Nov 2019). Time, Space, and the Brain; How do we know when we were? Invited lecture. Biology Department Seminar Series, SUNY Buffalo State College, Buffalo, NY.
- Marks WD** (Aug 2018). HIV in the central nervous system. Public lecture. Dallas Science Slam, Dallas, TX.
- Marks W**, McLane VD, McQuiston AR, Knapp PE, Hauser KF (2017). The effects of HIV-1 Tat and morphine on hippocampal function. Platform talk. 47th Annual Meeting of the Society for Neuroscience, Washington, DC.

Marks WD (Mar 2017). HIV-1 Tat induced disruption of hippocampal microcircuitry and spatial memory. Invited talk. Pharmacology & Toxicology Departmental Seminar Series, University of Texas Medical Branch; Department of Pharmacology & Toxicology. Galveston, TX.

Marks WD, Barbour AJ, Paris JJ, Moon J, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2017). Morphological and functional consequences of HIV-1 Tat on area CA1 of the hippocampus. Platform talk and poster presentation. 2017 Annual meeting of the American Society for Neurochemistry. Little Rock, AR.

Marks WD, Barbour AJ, Paris JJ, Schier CJ, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2016). HIV-1 Tat causes structural abnormalities in CA1 regional microcircuitry, and disturbances in CA1 function and memory formation. Platform talk. 46th Annual Meeting of the Society for Neuroscience, San Diego, CA.

Marks WD, Fitting S, Schier CJ, Hauser KF (2015) Selective vulnerability to HIV-1 Tat in a subset of CA1 hippocampal interneurons. Platform talk and poster presentation. 13th International Symposium on Neurovirology, San Diego, CA.

Marks WD (May 2015) The mad scientist and the mad Christian; integrating faith and reason. Invited public lecture. Catholic Diocese of Richmond; Richmond Theology on Tap, Richmond, VA.

AWARDS AND HONORS

2021	Artwork featured on special issue cover, <i>Learning and Memory</i>	
2019	Inscopix Tech Award, <i>Inscopix</i>	\$250
2017	BioLegend Young Investigator Travel Award, <i>BioLegend & American Society for Neurochemistry</i>	\$1000
2015	Outstanding Predoctoral Research Award, <i>International Society for Neurovirology</i>	
2013	Outstanding Master's Thesis Award, <i>SUNY College at Buffalo</i>	
2012	Graduate Travel Award, <i>SUNY College at Buffalo</i>	\$1000
2011	Summer Research Fellowship, <i>SUNY College at Buffalo</i>	\$2000
2009	St. Maximilian Kolbe Award for Outstanding Service, <i>Franciscan University of Steubenville</i>	

SERVICE

2022-present	Ad Hoc Reviewer, <i>Neuroscience Letters</i> .
2022	Judge, UTSW Postdoctoral Association travel award selection committee
2021-2022	Volunteer Presenter, Skype-a-Scientist Student Outreach Program
2018	Demonstration leader/ Communications and outreach committee, UTSW 75 th Anniversary/Science Saturday public outreach event
2018	Demonstration leader, UTSW O'Donnel Brain Institute, "Science in the City" outreach event
2017	Volunteer guide/presenter, American Society for Neurochemistry high school outreach event.
2017	Panel discussion speaker, American Physician-Scientist Association; "Choosing a good lab"
2016	Panel discussion speaker, VCU Graduate School recruitment event, School of Medicine representative
2016	Panel discussion speaker, American Physician-Scientist Association; "Choosing a good lab"

2014-2017 Graduate Student Recruiter, VCU School of Medicine

ABSTRACTS

- Terranova J, Yokose J, Osanai H, **Marks W**, Yamamoto J, Ogawa S, Kitamura T. (2022). Experience-Dependent Observational Fear in Hippocampal-Amygdala Memory Engram Networks. Poster presentation. 2022 Meeting of the Society for Behavioral Neuroendocrinology, Atlanta, GA.
- Yokose J, Terranova J, **Marks W**, Yamamoto J, Ogawa SK, Kitamura T. (2019). Self-recognition in the mouse hippocampus. Poster presentation. 49th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Marks W**, Osanai H, Ogawa S, Yamamoto J, Kitamura T. (2019). Novel behavioral approaches for analyzing temporal tracking, context-time integration, and time cell activity in mice. Poster presentation. 49th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Terranova J, Yokose J, **Marks W**, Yamamoto J, Ogawa S, Kitamura T. (2019). A hippocampal-amygdala circuit for experience-dependent observational fear. Poster presentation. 49th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Yamamoto N, Osanai H, **Marks W**, Ogawa S, Henkemeyer M, Kitamura T. (2019). Eph-Ephrin signaling is essential for formation of the cell clusters in layer II of medial entorhinal cortex. Poster presentation. 49th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Hahn YK, Nass S, **Marks WD**, Lichtman A, Knapp PE. (2019) HIV-associated cognitive deficits; altered synaptic proteins and spine ensity correlate with changes in activity-related cytoskeleton (Arc) expression. Nanosymposium platform talk. 49th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Lark A, Silva S, **Marks W**, Hauser K. (2019). Dynamic shifts in HIV-1 Tat-induced excitability and heightened sensitivity to morphine in dopamine D1 receptor-expressing striatal medium spiny neurons. Nanosymposium platform talk. 49th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Hahn YK, **Marks W**, Paris J, Kim S, Hauser K, Knapp P (2018). HIV-Associated cognitive deficits; sex specific outcomes correlate with change in Activity-Regulated Cytoskeleton (ARC) expression. Poster presentation. 2018 Annual meeting of the American Society for Neurochemistry, Riverside, CA.
- Lark A, Silva L, **Marks W**, Knapp P, Hauser K (2018). HIV-1 Tat alters acute morphine induced changes in excitability in dopamine receptor type-2-expressing striatal medium spiny neurons. Poster presentation. 2018 joint meeting of the International Society for Neurovirology and the Society on Neuroimmune Pharmacology, Chicago, IL.
- Silva L, Lark A, **Marks W**, Knapp P, Hauser K (2018). Morphine alters dopamine receptor type 2-expressing medium spine neuron physiology following acute exposure to HIV-1 Tat in a transgenic mouse model. Poster presentation. 2018 joint meeting of the International Society for Neurovirology and the Society on Neuroimmune Pharmacology, Chicago, IL.

- Marks W**, McLane VD, McQuiston AR, Knapp PE, Hauser KF (2017). The effects of HIV-1 Tat and morphine on hippocampal function. Platform talk. 47th Annual Meeting of the Society for Neuroscience, Washington, DC.
- Hahn Y, **Marks WD**, Paris JJ, Kim S, Hauser KF, Knapp PE (2017). Differences in activity-regulated cytoskeleton (ARC) expression related to HIV-associated memory and learning deficits in male and female mice. Poster presentation. 47th Annual Meeting of the Society for Neuroscience, Washington, DC.
- Silva LK, **Marks WD**, Paris JJ, Knapp PE, Hauser KF (2017). Effects of dopamine D2 receptor Activity on morphine and HIV-1 Tat-induced anxiety-like and motor behaviors in a transgenic mouse model of neuroAIDS. Poster presentation 47th Annual Meeting of the Society for Neuroscience, Washington, DC.
- Moon J, **Marks W**, Barbour AJ, Knapp PE, Hauser KF (2017). HIV-1 Tat causes selective reductions in dendritic spines in the stratum oriens and stratum radiatum, but not the stratum lacunosum-moleculare of hippocampal CA-1 pyramidal cells. Poster Presentation. 47th Annual Meeting of the Society for Neuroscience, Washington, DC.
- Marks WD**, Barbour AJ, Paris JJ, Moon J, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2017). Morphological and functional consequences of HIV-1 Tat on area CA1 of the hippocampus. Platform talk and poster presentation. 2017 Annual meeting of the American Society for Neurochemistry. Little Rock, AR.
- Hahn YK, Paris JJ, **Marks WD**, Kim S, Meshkin RS, Hauser KF, Knapp PE (2017). Sex-related difference in activity-regulated cytoskeleton (Arc) expression related to HIV-associated memory and learning deficits. Poster presentation. 2017 Annual Meeting of the American Society for Neurochemistry. Little Rock, AR.
- Marks WD**, Barbour AJ, Paris JJ, Schier CJ, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2016). HIV-1 Tat causes structural abnormalities in CA1 regional microcircuitry, and disturbances in CA1 function and memory formation. Platform talk. 46th Annual Meeting of the Society for Neuroscience, San Diego, CA.
- Marks WD**, Barbour AJ, Paris JJ, Schier CJ, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2016) Interaction between HIV-1 Tat and morphine causes disruption of GABAergic systems within CA1. Poster presentation. 14th International Symposium on Neurovirology, Toronto, Ontario, Canada.
- McLane V, **Marks W**, Knapp P, Hauser K (2016) Alterations in hippocampal CA3 synaptodendritic structure in the HIV-1 Tat transgenic mouse. Poster presentation. 14th International Symposium on Neurovirology, Toronto, Ontario, Canada.
- Marks WD**, Paris JJ, Schier CJ, Denton MD, Fitting S, McQuiston AR, Knapp PE, Hauser KF (2016) HIV-1 Tat causes structural deficits in a CA1 interneuron microcircuit, and disturbances in CA1 output and memory formation. Poster presentation. 2016 Annual Meeting of the American Society for Neurochemistry, Denver, CO.
- Schier CJ, **Marks WD**, Paris JJ, Barbour A, McQuiston AR, Knapp PE, Hauser KF (2016) CNS effects of opiate exposure in a mouse model of NeuroAIDS: selective vulnerability of D1 and D2-expressing medium spiny neurons. Platform Talk (Schier). 2016 Annual Meeting of the American Society for Neurochemistry, Denver, CO.
- Marks WD**, Fitting S, Schier CJ, Hauser KF (2015) nNOS positive interneuron subpopulations in CA1 subregions are selectively vulnerable to HIV-1 Tat. Poster presentation. 45th Annual Meeting of the Society for Neuroscience, Chicago, IL.

- Marks WD**, Fitting S, Schier CJ, Hauser KF (2015) Selective vulnerability to HIV-1 Tat in a subset of CA1 hippocampal interneurons. Platform talk and poster presentation. 13th International Symposium on Neurovirology, San Diego, CA.
- Schier CJ, **Marks W**, Paris JJ, McQuiston AR, Knapp PE, Hauser KF (2015) Selective vulnerability of D1-and D2-expressing medium spiny neurons after Tat +/- morphine treatments. Poster presentation. 13th International Symposium on NeuroVirology, San Diego, CA.
- Marks WD**, Schier CJ, Fitting S, Hauser KF. (2015) Selective vulnerability of a subset of nNOS+/NPY- hippocampal interneurons to HIV-1 Tat. Poster presentation. 2015 Symposium of the Central Virginia Chapter of the Society for Neuroscience, Richmond, VA.
- Marks WD**, Schier CJ, Fitting S, Hauser KF. (2015) Selective vulnerability of a subset of nNOS+/NPY- hippocampal interneurons to HIV-1 Tat. Poster presentation. 2015 Meeting of the Virginia Universities AIDS Research Consortium, Virginia Beach, VA.
- Marks WD**, Schier CJ, Fitting S, Hauser KF. (2014) Selective vulnerability of hippocampal interneurons to HIV-1 Tat. Poster presentation. 2014 Symposium of the Central Virginia Chapter of the Society for Neuroscience, Richmond, VA.
- DePriest AD, **Marks WD**, Skerrett IM (2012) Structure function analysis of innexin ShakingB(Lethal). Poster presentation. 56th Annual Meeting of the Biophysical Society, San Diego, CA.