

**Jonathan Paul Fadok, Ph.D.**  
**Curriculum vitae**  
**June 2021**

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<https://www.fadoklab.org/>

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**EDUCATION**

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2010      **PhD**, Neurobiology and Behavior, University of Washington  
2000      **BA**, Anthropology (*magna cum laude*), University of Arizona

**PROFESSIONAL APPOINTMENTS AND EMPLOYMENT**

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2020-pres      **Burk-Kleinpeter Early Career Professorship in Science & Engineering**, Tulane University  
2017-pres      **Assistant professor**, Department of Psychology, Tulane University  
2017-pres      **Faculty member**, Tulane Brain Institute, Tulane University  
2010-2017      **Postdoctoral fellow** (Lüthi lab), Neurobiology, Friedrich Miescher Institute for Biomedical Research  
2001-2004      **Research technician** (Fetz lab), Department of Physiology and Biophysics, University of Washington

**GRANTS**

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**Current:**

2021-2022      **The role of bottom-up noradrenergic signaling in mediating hyperarousal following trauma.** *Priddy Family Spark Research Award*, Tulane Brain Institute. Role: Principal Investigator (PIs: Fadok, Tasker).  
6/1/2021-6/30/2022  
The goal of this project is to understand how ascending information from the interoceptive hindbrain to the amygdala and hypothalamus contributes to altered behavior and physiology following trauma.

2020-2024      **Neural circuits regulating flight and panic behavior** (R01MH122561), *National Institute of Mental Health*. Role: Principal Investigator. 03/01/2020-12/31/2024  
The goal of this project is to identify how neuronal circuits control transitions between diverse types of defensive behaviors.

**Completed:**

2018-2021      **Neuronal Mechanisms Controlling the Scalability of Fear** (LEQSF (2018-21)-RD-A-17), *Research Competitiveness Subprogram Grant*, Louisiana Board of Regents. Role: Principal Investigator. 6/1/2018-6/1/2021

The goal of this project was to acquire data related to how neuronal circuits regulate the intensity of fear reactions.

- 2018-2019 **Determining the Neuronal Correlates of Fear Intensity using Advanced Neurotechnology**, *Marko Spark Research Innovation Award*, Tulane Brain Institute Research Fund. Role: Principal Investigator (PIs: Fadok, Mostany). 7/1/2018-6/30/2019  
The goal of this project was to implement deep-brain calcium imaging to determine the neuronal encoding of fear and anxiety states.
- 2015-2016 **The role of CRF projection pathways in active fear responding**, *NARSAD Young Investigator Award*, Brain and Behavior Research Foundation. Role: Principal Investigator. 1/1/2015-12/31/2016  
The goal of this project was to define the role of specific amygdala projection pathways in flight responses.
- 2012-2013 **Understanding the function of amygdala to basal forebrain projections using novel virus-based strategies and optogenetics** (ALTF 952-2011), *Long-term Fellowship*, European Molecular Biology Organization. Role: Postdoctoral Fellow. 1/1/2012-10/1/2013  
The goal of this project was to define the role of amygdala projections to the basal forebrain in arousal and attention.
- 2007-2009 **Determining the role of dopamine in fear conditioning** (PHS NRSA 2T32 GM007270), *Ruth L. Kirschstein National Research Service Award*, National Institute of General Medical Sciences. Role: Graduate student. 1/1/2007-12/31/2009

## PUBLICATIONS (H-index = 14)

Publication impact: [\*Fadok citations\*](#)

- (1) Whittle, N; **Fadok, JP**; MacPherson, KP; Botta, P; Wolff, SBE; Müller, C; Herry, C; Tovote, P; Holmes, A; Singewald, N; Lüthi, A; Cioocchi, S. (*accepted*) Central amygdala inhibitory circuits mediate fear extinction. *Nature Communications*.
- (2) Borkar, C; **Fadok, JP** (2021) The hypothalamus coordinates diverse escape strategies from threat. *Neuron*. 109: 1763-1765.
- (3) Borkar, C.; **Fadok, JP**. (2021) A novel Pavlovian fear conditioning paradigm to study freezing and flight behavior. *Journal of Visualized Experiments*. 167: e61536.
- (4) Borkar, C; Dorofeikova, M; Le, QE, Vutukuri, R; Vo, C; Hereford, D; Resendez, A; Basavanhalli, S; Sifnugel, N; **Fadok, JP**. (2020) Sex differences in behavioral responses during a conditioned flight paradigm. *Behavioural Brain Research*. 389: 112623.
- (5) **Fadok, JP**; Markovic, M; Tovote P; Luthi, A. (2018) New perspectives on central amygdala function. *Current Opinion in Neurobiology*. 49: 141-147.
- (6) **Fadok, JP**; Krabbe, S; Markovic, M; Courtin, J; Xu, C; Massi, L; Botta, P; Bylund, K; Müller, C; Kovacevic, A; Tovote, P; Lüthi, A. (2017) A competitive inhibitory circuit for selection of active and passive fear responses. *Nature*. 542(7639): 96-100.
- (7) Karmakar, K; Narita, Y; **Fadok, JP**; Ducret, S; Loche, A; Kitazawa, T; Genoud, C; Di Meglio, T; Thierry, R; Bacelo, J; Lüthi, A; Rijli, FM. (2017) *Hox2* genes are required for

- tonotopic map precision and sound discrimination in the mouse auditory brainstem. *Cell Reports*. 18(1): 185-197.
- (8) Xu, C; Krabbe, S; Botta, P; **Fadok, JP**; Gründemann, J; Osakada, F; Saur, D; Grewe, B; Schnitzer, M; Callaway, EM; Lüthi, A. (2016) Distinct hippocampal pathways mediate dissociable roles of context in memory retrieval. *Cell*. 167(4): 961-972.
  - (9) Tovote, P; Esposito, MS; Botta, P; Chaudun, F; **Fadok, JP**; Markovic, M; Wolff, SB; Ramakrishnan, C; Fenno, L; Deisseroth, K; Herry, C; Arber, S; Lüthi, A. (2016) Midbrain circuits for defensive behavior. *Nature*. 534(7606): 206-12.
  - (10) Tovote, P\*; **Fadok, JP\***; Lüthi, A. (2015) Neuronal circuits for fear and anxiety. *Nature Reviews Neuroscience*. 16(6): 317-31. *\*Equal contribution*.
  - (11) Botta, P; Demmou, L; Kasugai, Y; Markovic, M; Xu, C; **Fadok, JP**; Lu, T; Poe, MM; Xu, L; Cook, JM; Rudolph, U; Sah, P; Ferraguti, F; Lüthi, A. (2015) Regulating anxiety with extrasynaptic inhibition. *Nature Neuroscience*. 18(10): 1493-500.
  - (12) Senn, V; Wolff, SBE; Herry, C; Grenier, F; Ehrlich, I; Gründemann, J; **Fadok, JP**; Müller, C; Letzkus, JJ; Lüthi, A. (2014) Long-range connectivity defines behavioral specificity of amygdala neurons. *Neuron*. 81(2): 428-437.
  - (13) Zweifel, LS\*; **Fadok, JP\***; Argilli, E; Garelick, MG; Jones, GL; Dickerson, TM; Allen, JM; Mizumori, SJ; Bonci, A; Palmiter, RD. (2011) Activation of dopamine neurons is critical for aversive conditioning and prevention of generalized anxiety. *Nature Neuroscience*. 14(5): 620-6. *\*Equal contribution*.
  - (14) Darvas, M; **Fadok, JP**; Palmiter, RD. (2011) Requirement of dopamine signaling in the amygdala and striatum for learning and maintenance of a conditioned avoidance response. *Learning and Memory*. 18(3): 136-43.
  - (15) Wall, VZ; Parker, JG; **Fadok, JP**; Darvas, M; Zweifel, L; Palmiter, RD. (2011) A behavioral genetics approach to understanding D1 receptor involvement in phasic dopamine signaling. *Molecular and Cellular Neuroscience*. 46(1): 21-31.
  - (16) **Fadok, JP**; Darvas, M; Dickerson, TM; Palmiter, RD. (2010) Long-term memory for Pavlovian fear conditioning requires dopamine in the nucleus accumbens and basolateral amygdala. *PLoS ONE*. 5(9): e12751.
  - (17) **Fadok, JP**; Dickerson, TM; Palmiter, RD. (2010) Dopamine is necessary for cue-dependent fear conditioning. *Journal of Neuroscience*. 29(36): 11089-11097.
  - (18) Zweifel, LS; Parker, JG; Lobb, CJ; Rainwater, A; Wall, VZ; **Fadok, JP**; Darvas, M; Kim, MJ; Mizumori, SJ; Paladini, CA; Phillips, PE; Palmiter, RD. (2009) Disruption of NMDAR-dependent burst firing by dopamine neurons provides selective assessment of phasic dopamine-dependent behavior. *Proceedings of the National Academy of Sciences*. 106(18): 7281-88.

## ACADEMIC AND PROFESSIONAL HONORS AND AWARDS

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- 2021 **Associate Membership**, American College of Neuropsychopharmacology
- 2020 **Burk-Kleinpeter Early Career Professorship in Science & Engineering**, Tulane
- 2020 **Junior Faculty R01 Award**, School of Science and Engineering, Tulane
- 2020 **Largest New Grant Award**, School of Science and Engineering, Tulane
- 2018 **Travel Award**, American College of Neuropsychopharmacology
- 2018 **Faculty Networking Seminar**, Tulane Provost's Office
- 2018 **Travel Grant for Emerging Faculty**, National Science Foundation and Louisiana Board of Regents
- 2017 **Travel Grant**, Committee on Research Faculty and Tulane University Provost's Office

- 2015 **Young Investigator Award**, Brain and Behavior Research Foundation  
2015 **Best poster award**, Gordon Research Conference, The Amygdala in Health and Disease  
2012 **Travel Fellowship**, Frontiers in Stress and Cognition  
2012 **Best Poster Award**, Swiss Society for Neuroscience Annual Meeting

#### CONFERENCE PROCEEDINGS - ORAL PRESENTATIONS

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- 2020 Distributed circuits for the selection of defensive responses. *Winter Conference on Brain Research*, Big Sky, Montana  
2019 Competitive inhibitory circuits for selection of active and passive fear responses. Minisymposium speaker, *Society for Neuroscience Annual Meeting*, Chicago, Illinois  
2019 Neural circuit mechanisms controlling defensive responses. *Association for Psychological Science Annual Convention*, Washington, D.C.  
2019 Defining the neural circuit mechanisms controlling passive and active defensive strategies. *Social and Affective Neuroscience Society Annual Meeting*, Miami, Florida  
2018 The central amygdala mediates scalable defensive behaviors. 30<sup>th</sup> annual meeting of the *Winter Conference on Neural Plasticity*, Willemstad, Curacao  
2016 A competitive inhibitory circuit for selection of active and passive fear responses, *Inner Workings of a Molecular Brain* conference, Santorini, Greece  
2016 A competitive inhibitory circuit for selection of active and passive fear responses, *Cellular and Molecular Neurobiology of Mental Disease* conference, Giessbach, Switzerland

#### CONFERENCE PROCEEDINGS - POSTER PRESENTATIONS

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- 2020 Prefrontal cortex projections to the central amygdala regulate defensive behavior. *American College of Neuropsychopharmacology Annual Meeting*, virtual meeting  
2019 Sex differences in conditioned flight. *American College of Neuropsychopharmacology Annual Meeting*, Hollywood, Florida  
2019 Sex dependent behavioral changes in a conditioned flight paradigm. *Amygdala Function in Emotion, Cognition and Disease*, Gordon Research Conference, Stonehill College, Easton, Massachusetts.  
2018 Determining the role of the central amygdala in modulating complex fear states. *American College of Neuropsychopharmacology Annual Meeting*, Hollywood, Florida  
2016 A competitive inhibitory circuit for selection of active and passive fear responses. *Society for Neuroscience Annual Meeting*, San Diego, California  
2015 Central amygdala neurons gate expression of conditioned flight behavior. *The Amygdala in Health and Disease*, Gordon Research Conference, Stonehill College, Easton, Massachusetts.  
2014 Central amygdala neurons gate expression of conditioned flight behavior. *Society for Neuroscience Annual Meeting*, Washington, D.C.  
2014 CRF neurons in the central amygdala mediate conditioned active fear behavior. *Swiss Society for Neuroscience Annual Meeting*, Bern, Switzerland  
2012 Amygdala circuits mediating the switch between active and passive fear responses. *Society for Neuroscience Annual Meeting*, New Orleans, Louisiana  
2012 Amygdala circuits mediating the switch between active and passive fear responses.

- Frontiers in Stress and Cognition* conference, Ascona, Switzerland
- 2012 Neuronal circuitry underlying multiple valence learning. *NCCR Synapsy Annual Meeting*, Villars, Switzerland
- 2012 Determining the function of amygdala projections to the basal forebrain. *Swiss Society for Neuroscience Annual Meeting*, Zurich, Switzerland.
- 2009 An essential role for dopamine in fear conditioning. *42<sup>ND</sup> Annual Winter Conference on Brain Research*, Copper Mountain, Colorado
- 2008 An essential role for dopamine in fear conditioning. *Howard Hughes Medical Institute Meeting on Neural Circuits*, Ashburn, Virginia
- 2004 Effects of intraspinal stimulation in C6-T1 and C3-C4 segments on arm muscle activity (EMG) in behaving monkeys. *Society for Neuroscience Annual Meeting*, San Diego, California

### INVITED TALKS

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- 2019 Central amygdala circuits mediate the selection of adaptive behavior. *Department of Psychology*, University of California, Davis
- 2018 Elucidating the neuronal mechanisms that modulate fear intensity. *Center for Molecular and Behavioral Neuroscience*, Rutgers University, New Brunswick, New Jersey
- 2018 Neuronal mechanisms controlling fear scalability. *Alcohol and Drug Abuse Center of Excellence 9<sup>th</sup> Scientific Retreat*, LSU School of Medicine, New Orleans, Louisiana
- 2017 Dissecting the neuronal circuits of defensive behavior. *Department of Cell Biology and Anatomy*, Louisiana State University Health Science Center, New Orleans, Louisiana
- 2017 Dissecting the neuronal circuits of defensive behavior. *Neurocentre Magendie*, INSERM, Bordeaux, France
- 2017 Dissecting the neuronal circuits of defensive behavior. *Center for Neural Science*, New York University, New York, New York
- 2017 Dissecting the neuronal circuits of defensive behavior. *Department of Psychological and Brain Sciences*, Boston University, Boston, Massachusetts
- 2017 Dissecting the neuronal circuits of defensive behavior. *Department of Psychology*, University of Maryland, College Park, Maryland
- 2017 Dissecting the neuronal circuits of defensive behavior. *Tulane Brain Institute*, Tulane University, New Orleans, Louisiana
- 2013 The role of CE1 CRF neurons in active fear responding, *Department of Biochemistry*, University of Washington, Seattle, Washington
- 2011 Determining the Function of Amygdala Projections to the Basal Forebrain, *University College London*, London, England
- 2009 Dopamine is necessary for cue-dependent fear conditioning, *Neurobiology and Behavior Program Retreat*, University of Washington, Seattle, Washington

### TEACHING EXPERIENCE

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#### **Tulane University:**

Instructor of record (Undergraduate):

*Brain and Behavior* (Fall 2017, 2018, 2019)

*Honors Brain and Behavior* (Spring 2019, 2020)

Instructor of record (Graduate):

*Neurobiology of Emotion* (Spring 2021)

Guest lecturer (Graduate):

*Graduate Neuroscience I* (Fall 2020)

Instructor of record: Dr. Jeffrey Tasker

*Graduate Neuroscience II* (Spring 2018, 2019)

Instructor of record: Dr. Sara Clark

**University of Washington:**Graduate Teaching Assistant:

*Introduction to Systems Neurobiology* (Spring 2007)

Instructor of record: Dr. Michael Kennedy

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**RESEARCH MENTORING**

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**Postdoctoral Fellows**

- 2020-pres Claire Stelly, PhD (University of Texas, Austin)  
2018-pres Chandrashekhkar Borkar, PhD (Nagpur University, India)  
2018-2021 Maria Dorofeikova, MD, PhD (Saint Petersburg State University, Russia)

**Graduate students**

- 2019-pres Quan-Son Le, MS, PhD Program in Neuroscience  
2019-pres Daniel Hereford, PhD Program in Neuroscience  
2019-pres Lydia Smith-Osborne, DVM, TNPRC T32 NRSA Ph.D. Training Program  
2020-pres Kate Weissmuller, Master's Program in Neuroscience (thesis-track)  
2021-pres Kasey Anderson, PhD Program in Neuroscience  
2020-2021 Catharina Westergaard, Master's Program in Neuroscience (non-thesis track)  
2020-2021 Tal Sherman, Master's Program in Neuroscience (non-thesis track)

**Undergraduate Research Assistants (current)**

Rithvik Vutukuri (2018-present), Catherine Vo (2019-present), Camilla Schreiber (2019-present), Harrison Blefeld (2020-present), Anh Duong (2020-present), Alyssa Hall (2020-present), Avery Smith (2020-present), Adam Goodman (2021-present), Naseem Azadi (2021-present)

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**MENTORED RESEARCH PRESENTATIONS**

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- 2021 Borkar, CD; Fu, X; Le, EQ; Vutukuri, R; Vo, C; Resendez, A; Tasker, J; **Fadok, JP**. Role of Prefrontal Cortex Afferents to the Amygdala in Regulation of Defensive Behavior. *SfN Global Connectome*

- 2019 Weissmuller, K; Dorofeikova, M; Resendez, A; **Fadok, JP**. Neuronal Circuit Mechanisms Underlying Cognitive Changes in Models of Brain Disorders. *Tulane Undergraduate Research in Neuroscience Poster Session*
- 2019 Borkar, C; Dorofeikova, M; Martin, R; Sifnugel, N; Vutukuri, R; Resendez, A; **Fadok, JP**. Defining the neural circuit mechanisms underlying switches from passive to active fear behavior. Poster presented at *Tulane Health Science Research Day*
- 2018 Martin, R; Borkar, C; Dorofeikova, M; Sifnugel, N; Le, QS; Resendez, A; **Fadok, JP**. Recording the neural correlates of fear and anxiety using deep-brain calcium imaging. Poster presented at the *Greater New Orleans Society for Neuroscience Meeting*
- 2018 Sifnugel, N; Dorofeikova, M; Resendez, A; **Fadok, JP**. Quantifying GABAergic, Glutamatergic, and Cholinergic Neurons in the Substantia Innominata. *Tulane Undergraduate Research in Neuroscience Poster Session*

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**GRADUATE STUDENT COMMITTEE MEMBER**

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Jill King (2018-present; Markant lab), Neuroscience PhD Program; Brianna Keenan (2018-present; Markant lab), Psychology PhD Program; Michael Langhardt (2018; Mostany lab), Neuroscience PhD Program; Alexis Ducote (2019-present; Mostany lab), Neuroscience PhD Program; Taylor Templeton (2019-present; Gilpin lab), Physiology PhD Program, LSU School of Medicine; Youad Darwish (2020-present; Huang lab), Cellular and Molecular Biology PhD Program; Nathan Sharfman (2020-present; Gilpin lab), Physiology PhD Program, LSU School of Medicine; Xiao Han (2020-present; Galazo lab), Neuroscience PhD Program

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**SERVICE TO PROFESSION**

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- 2021 **Member, Fellowships: Behavioral Neuroscience**, Center for Scientific Review, National Institutes of Health (202110 ZRG1 F02A K20)
- 2020-pres **Ad-hoc Grant reviewer**, Swiss National Science Foundation (SNF)
- 2019-pres **Organizing committee member**, D'Angelo Workshop on Co-morbid Mental Health Disorders
- 2018 **Co-Chair**, Society for Neuroscience Annual Meeting Nanosymposium: Cortical and Subcortical Mechanisms of Learning and Cognition
- 2018-pres **Ad-hoc Grant reviewer**, German Research Foundation (Deutsche Forschungsgemeinschaft)

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**AD-HOC JOURNAL PEER REVIEW** (highest impact factor first)

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Nature, Nature Neuroscience, Neuron, Trends in Cognitive Sciences, Science Advances, Molecular Psychiatry, Nature Communications, Biological Psychiatry, Current Biology, Neuroscience & Biobehavioral Reviews, Cell Reports, eLife, Neuropsychopharmacology, Translational Psychiatry, Psychopharmacology, Current Opinion in Behavioral Sciences, Neurobiology of Learning and Memory, Behavioural Brain Research, Physiology and Behavior

**DEPARTMENTAL SERVICE**

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2019-pres **Member**, *PhD Admissions Committee*, Department of Psychology  
2018-pres **Member**, *Graduate Training Committee*, Department of Psychology  
2018-pres **Member**, *Presidential Chair Search Committee*, Tulane Brain Institute  
2017-pres **Advisor**, *psychology majors*, Department of Psychology  
2017-2018 **Member**, *Colloquium Committee*, Department of Psychology

**PROFESSIONAL MEMBERSHIPS**

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Society for Neuroscience, 2012-present  
Social and Affective Neuroscience Society, 2019-present  
Pavlovian Society, 2020-present  
American College of Neuropsychopharmacology, 2021-present