

Curriculum Vitae

Alex C. Keene

Professor and Head, Department of Biology
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Education

2002-2006 PhD, Biomedical Sciences
University of Massachusetts Medical School

2000-2002 BS, Biology (minor in Anthropology)
University of Massachusetts, Amherst

Research Experience

2021-Present **Texas A&M University**
Professor and Head, Department of Biology

2020-2021 **Florida Atlantic University**
Professor, Department of Biological Sciences

2015-2020 **Florida Atlantic University**
Associate Professor, Department of Biological Sciences

2011-2015 **University of Nevada, Reno**
Assistant Professor, Department of Biology

2008-2011 **New York University**
Post-Doctoral Research, Justin Blau (Advisor)

2006-2007 **Institute of Molecular Pathology, Vienna**
Post-Doctoral Research, Barry J. Dickson (Advisor)

2002-2006 **University of Massachusetts Medical School**
Dissertation Research, Scott Waddell (Advisor)

2000-2002 **University of Massachusetts, Amherst**
Undergraduate Research, Eric S. Corp and George N. Wade (Advisors)

Publications

- Lloyd E, Chhouk, B, **Keene AC**, and Albertson RC. Diversity in rest-activity patterns among Lake Malawi cichlid fishes suggests novel axis of habitat partitioning. *Biorxiv*, 2020.07.14.203505, and *J. Exp. Biol. in press*
- Warren WC, Boggs TE, Borowsky R, Carlson BM, Ferruino E, Gross JF, Hillier L, Hu Z, **Keene AC**, Kenzior A, Kowalko JE, Tomlinson C, Kremitzki M, Lemieux ME, Graves-Lindsay T, McGaugh SE, Miller JT, Mommersteeg M, Moran RL, Peuss R, Rice E, Riddle MR, Sifuentes-Romero I, Stanhope BA, Tabin CJ, Thakur S, Yoshiyuki Y, and Rohner N. A chromosome level genome of *Astyanax mexicanus* surface fish for comparing populations-specific genetic differences contributing to trait evolution. *Biorxiv*, 2020.07.06.189654, and *Nature Comm. In press*.
- Shafer OT and **Keene AC**. The functions and regulation of *Drosophila* sleep. *Curr Biol.* (2021) 31(1): R38-R49.
- Collie J, Granela O, Brown EB, and **Keene AC**. Aggression is induced by resource limitation in the monarch caterpillar. *iScience*,(2020) 23 (12):101791.
- Jaggard JB, Lloyd E, Yuiska A, Patch A, Fily Y, Kowalko JE, Appelbaum L, Duboue ER, and **Keene AC**. Cavefish brain atlases reveal functional and anatomical convergence across independently evolved populations. *Science Advances.* (2020) 6, 38, eaba3126.
- Paz A, McDole B, Kowalko JE, Duboue ER, and **Keene AC**. Evolution of the acoustic startle response in Mexican cavefish. *J. Exp B Mol Dev Evol.* (2020), 10.1002, jez.b22988.

7. Chin JSR, Loomis CL, Albert LT, Medina-Trenche S, Kowalko J, **Keene AC**, and Duboue ER. Analysis of stress responses in *Astyanax* larvae reveals heterogeneity among different populations. *J. Exp B Mol Dev Evol.* (2020), 10.1002, jez.b22987.
8. Sifuentes-Romero I, Ferrufino E, Thakur S, Laboissonniere LA, Solomon M, Smith CL, **Keene AC**, Trimarchi JM, Kowalko JE. Repeated evolution of eye loss in Mexican cavefish: Evidence of similar developmental mechanisms in independently evolved populations. *J. Exp B Mol Dev Evol.* (2020), 10.1002, jez.b22977.
9. Stahl BA, Jaggard JB, Brown EB, and **Keene AC**. Sleep regulates the glial engulfment receptor Draper to promote Wallerian Degeneration. *Current Biology.* (2020), 30(6):1092-1101
10. Pamboro-Laure E, Brown EB and **Keene AC**. Dietary fatty acids promote sleep through a taste-independent mechanism. *Genes, Brain, Behavior.* (2020) (4):e12629
11. Brown EB, Shah KD, Faville R, Kottler B, and **Keene AC**. *Drosophila insulin-like peptide 2* mediates dietary regulation of sleep intensity. *Plos Genetics*, 16(3):e1008270.
12. McGaugh SE, Passow CN, Jaggard JB, Stahl BA, and **Keene AC**. Unique transcriptional signatures of sleep loss across independently evolved cavefish populations. *J. Exp. Zool B*, (2020) 334 (7-8):497-510.
13. McGaugh SE, Kowalko JE, Duboue ER, Lewis P, Franz-Odenaal T, Rohner N, and Gross JB, and **Keene AC**. Dark world rises: The emergence of cavefish as a model for the study of evolution, behavior, and disease. *J. Exp. Zool B*. (2020) 334 (7-8):397-404.
14. Loomis C, Peuss R, Jaggard JB, Wang Y, McKinney S, Raftopoulos S, Raftopolos A, Whu D, Green M, McGaugh SE, Rohner N, **Keene AC**, and Duboue ER. An adult brain atlas reveals broad neuroanatomical changes in independently evolved populations of Mexican cavefish. *Front Neuroanat.* (2020) 13,88.
15. Chin JSF, Albert LT, Loomis CL, **Keene AC**, Duboue ER. Behavioral approaches to studying innate stress in zebrafish. *J. Vis Exp.* (2019), 10.3791/59092
16. Stahl BA, Jaggard JB, Chin JSR, Kowalko JE, **Keene AC**, and Duboue ER. Manipulation of gene function in Mexican cavefish. *J. Vis. Exp.* (2019), 10.3791/59093.
17. Jaggard JB, Lloyd E, Lopatto A, Duboue ER, and **Keene AC**. Automated measurements of sleep and locomotor activity in Mexican cavefish. *J. Vis. Exp.* (2019), 10.3791/59198
18. Stahl BA, Peuss R, McDole B, Kenzior A, Jaggard JB, Gaudenz K, Krishnan K, McGaugh SE, Duboue ER, **Keene AC**, and Rohner N. Stable transgenesis in *Astyanax mexicanus* using the Tol2 transposase system. *Dev Dyn.* (2019), 10.1002/dvdy.32.
19. Yurgel ME, Kakad P, Zandawala P, Nässel DR, Godenschwege TA, and **Keene AC**. Leucokinin neurons are modulated by feeding state and regulate sleep-metabolism interactions. *Plos Biol.* (2019) 17(2):e2006409
20. Brown EB, Slocumb ME, Szuperak M, Kerbs A, Gibbs AG, Kayser MS, and **Keene AC**. Starvation resistance is associated with developmentally specified changes in sleep, feeding, and metabolic rate. *J Exp Biol.* (2019) 10.1242/191049.
21. Zandawala M, Yurgel ME, Texada MJ, Liao S, Rewitz KF, **Keene AC**, and Nässel DR. Modulation of *Drosophila* post-feeding physiology and behavior by the neuropeptide leucokinin. *Plos Genet.* (2018) 14(11):e1007767.
22. Passow CN, Kono TJY, Stahl BA, Jaggard JB, **Keene AC**, and McGaugh SE. Nonrandom RNAseq gene expression associated with RNAlater and flash freezing storage methods. *Mol Ecol Resources.* (2018) doi:10.1111/1755-0998.
23. Stahl BA, Beco E, Davla S, Murakami K, Caicedo Moreno NA, van Meyel DJ, and **Keene AC**. The taurine transporter Eaat2 functions in ensheathing glia to modulate sleep and metabolic rate. *Curr Biol.* (2018) 28(22)3700-3708.
24. Herman A, Brandvain Y, Weagley J, Jeffery WR, **Keene AC**, Kono TJY, Bilandžija H, Borowsky R, Espinasa L, O'Quin K, Ornelas-García CP, Yoshizawa M, Carlson B, Maldonado E, Gross JB, Cartwright RA, Rohner N, Warren WC, and McGaugh SE. The role of gene flow in rapid and repeated evolution of cave-related traits in Mexican tetra, *Astyanax mexicanus*. *Mol Ecol.* (2018) 27(22)4387-4416).
25. Yurgel ME, Shah KD, Brown EB, Burns C, Bennick RA, DiAngelo JR, and **Keene AC**. *Ade2* functions in the *Drosophila* fat body to promote sleep. *G3 (Bethesda)* (2018) 8(11):3385-3395.
26. **Keene AC**, Duboue ER. The origins and evolution of sleep. (2018) *J Exp Biol.* 12;221(pt11).
27. Chin JSR, Gassant CE, Amaral P, Lloyd E, Stahl BA, Jaggard JB, **Keene AC**, and Duboue ER. Convergence on reduced stress in the Mexican Blind Cavefish. *Dev Biol.* (2018). 441(2):319-327.
28. Lloyd E, Olive C, Stahl BA, Jaggard JB, Amaral P, Duboue ER, and **Keene AC**. Evolutionary shift towards lateral line dependent prey-capture behavior in the blind Mexican cavefish. *Dev Biol.* (2018). 441(2):328-337.
29. Yurgel ME and **Keene AC**. Sleep: Helicon Cells Charge the Circuit. *Current Biology.* (2018). 28 (7) R317-319.
30. Jaggard JB, Stahl BA, Lloyd E, Prober DA, Duboue ER and **Keene AC**. Hypocretin underlies the evolution of sleep loss in the Mexican cavefish. (2017) *eLife*, 10 (1101) 122903.
31. Brown E, Torres J, Bennick RA, Rozzo V, Kerbs A, DiAngelo JR and **Keene AC**. Geographic variation in sleep and metabolic function is associated with latitude and temperature. (2017) *Ecology and Evolution* 10(1101) 182790.

32. Tauber JM, Brown E, Li Y, Yurgel ME, Masek P and **Keene AC**. A subset of sweet-sensing neurons identified by Ir56d are necessary and sufficient for fatty acid taste. (2017) ***Plos Genetics***. 13(11):e1007059.
33. Stahl BA and **Keene AC**. To rebound or not to rebound. (2017) ***Elife***, 6, e31646v.
34. Stahl BA, Slocumb ME, Chaitin H, DiAngelo JR and **Keene AC**. Sleep-Dependent Modulation of Metabolic Rate in *Drosophila*. (2017) ***Sleep***. 40(8) zsx084.
35. Jaggard JB, Robinson B, Stahl BA, Oh I, Masek P, Yoshizawa M, and **Keene AC**. The lateral line confers evolutionarily derived sleep loss in the Mexican cavefish. ***J. Experimental Biology***. 220(2)284-93.
36. Murphy KR, Deshpande SA, Yurgel ME, Quinn JP, Weissbach JL, **Keene AC**, Dawson-Scully K, Huber R, Tomchik SM, Ja WW (2016). Postprandial Sleep Mechanics in *Drosophila*. (2016). ***Elife*** 5. pii: e19334.
37. Masek P and **Keene AC**. Gustatory processing and taste memory in *Drosophila*. (2016). ***J. Neurogenetics***. 30(2) 112-21.
38. Murakami K, Yurgel ME, Stahl BA, Masek P, Mehta A, Heidker R, Bollinger W, Gingras RM, Kim YJ, Ja WW, Suter B, DiAngelo JR, **Keene AC**. *translin* is required for metabolic regulation of sleep (2016). ***Current Biology***. 26(7):972-80.
39. Arble DM, Bass J, Behn CD, Butler MP, Challet E, Czeisler C, Depner CM, Elmquist J, Franken P, Grandner MA, Hanlon EC, **Keene AC**, Joyner MJ, Karatsoreos I, Kern PA, Klein S, Morris CJ, Pack AI, Panda S, Ptacek LJ, Punjabi NM, Sassone-Corsi P, Scheer FA, Saxena R, Seaquest ER, Thimman MS, Van Cauter E, Wright KP. Impact of sleep and circadian disruption on energy balance and diabetes: A summary of workshop discussions (2015) ***Sleep***. 38(12):1849-60.
40. Garbe DS, Bollinger WL, Vigderman A, Masek P, Gertowski J, Sehgal A and **Keene AC**. Context specific comparison of sleep acquisition system in *Drosophila* (2015). ***Biology open***. 4(11):1558-68
41. Seidner G, Robinson JE, Wu M, Worden K, Masek P, Roberts SW, **Keene AC** and Joiner WJ. Identification of privileged neurons with a privileged role in sleep homeostasis in *Drosophila melanogaster* (2015). ***Current Biology***. (22):2928-38.
42. Slocumb ME, Regalado JM, Yoshizawa M, Neely GG, Masek P, Gibbs AG, and **Keene AC**. Enhanced sleep in an evolutionarily adaptive response to starvation stress in *Drosophila* (2015). ***Plos One***. 10(7)eo131275.
43. Masek P, Worden K, Aso Y, Rubin GM, and **Keene AC**. A dopamine-modulated neural circuit regulating aversive taste memory in *Drosophila* (2015) ***Current Biology***. 25(11):1535-41.
44. **Keene AC** and Joiner WJ. Neurodegeneration: paying it off with sleep. ***Current Biology***. (2015). 25(6):R234-6.
45. Yoshizawa M, Robinson BG, Duboue ER, Masek P, Jaggard, JB, O'Quin KE, Borowsky RL, Jeffery WR and **Keene AC**. Distinct genetic architecture underlies the emergence of foraging traits in the Mexican cavefish (2015) ***BMC Biology*** 20 (13):15.
46. Yurgel ME, Masek P, DiAngelo JR and **Keene AC**. Genetic dissection of sleep-metabolism interactions (2014) ***J Comp Physiol A***. 201 (9):869-77.
47. McGaugh SE, Gross JB, Aken B., Blin M, Borowsky RB, Chalopin C, Hinaux H, Jeffery WR, **Keene AC**, Ma L, Minx P, Murphy D, O'Quin KE, Retaux S, Rohner N, Searle SM, Stah BA, Tabin C, Volf JN, Yoshizawa M, and Warren WC. The cavefish genome reveals candidate genes for eye loss. (2014) ***Nature Communications***. 20(5):5307.
48. Murakami M and **Keene AC**. Development: Better sleep on it, children. (2014) ***Current Biology***. 24(12):R569-71.
49. Masek P, Reynolds L, Bollinger WL, Moody C, Mehta A, Yoshizawa M, Gibbs A, and **Keene AC**. Altered sleep and feeding contribute to starvation resistance in *Drosophila*. (2014) ***J. Exp. Biol.*** 1(217):3122-32.
50. Masek, P and **Keene AC**. *Drosophila* Fatty Acid Taste Signals through the PLC Pathway in Sugar-Sensing Neurons (2013). ***Plos Genetics***. 9(9): e1003710.
51. Robertson M and **Keene AC**. Molecular Mechanisms of Age-Related Sleep Loss. (2013) ***Gerontology***. 9(4):334-9.
52. Sassu ED, McDermott JE, Keys BJ, Esmaeilli M, Keene AC, Birnbaum MJ, and DiAngelo JR. Mio/dChREBP coordinately increases fat mass by regulation lipid synthesis and feeding behavior in *Drosophila*. (2012) ***Biochem Biophys Res Commun***. 426 (1):42-8.
53. Masek, P and **Keene AC**. Dopamine: On the threshold of sleep. (2012) ***Current Biology***. 11(22):R949-51.
54. Duboue ER, Borowsky RB, and **Keene AC**. β -adrenergic signaling regulates evolutionarily derived sleep loss in the Mexican Cavefish. (2012) ***Brain, Behavior, Evolution***. 21(80):233-43.
55. **Keene AC** and Masek P. Optogenetic induction of aversive taste memory. (2012) ***Neuroscience***. 11(222):173-80.
56. **Keene AC** and Sprecher SG. Seeing the light: Photobehavior in fruit fly larvae. (2011) ***Trends in Neuroscience***. 35(2):104-110.
57. Neely, GG*, **Keene AC***, Duchek P, Chang EC, Wang QP, Aksoy YA, Rosenzweig M, Costigan M, Garrity P, and Penninger JM. TRPA1 regulates thermal nociception in *Drosophila*. (2011) ***Plos One***, 6(8):e24343.
58. Dus M, Min SH, Lee GY, **Keene AC**, and Suh GB. Taste-independent detection of the caloric content of sugar in *Drosophila*. (2011) ***Proc. Natl. Acad. Sci. USA***. 108(28);11644-9.
59. **Keene AC**, Mazzocchi EO, Blau J, Desplan C and Sprecher SG. Distinct photoreceptor neurons mediate *Drosophila* light avoidance and circadian clock entrainment. (2011) ***J. Neuroscience***. 31(17):6527-34.

60. Duboue ER, **Keene AC**, and Borowsky RB. Evolutionary convergence on sleep loss in cavefish populations. (2011) **Current Biology** 8; 671-76.
61. McDonald DM and **Keene AC**. The sleep-feeding conflict: Understanding behavioral integration through genetic analysis in *Drosophila*. (2010) **Aging**, 2(8):1-4.
62. **Keene AC**, Duboue ER, McDonald DM, Dus, M, Suh GB, Waddell, S and Blau J. Clock and cycle limit starvation-induced sleep loss in *Drosophila*. (2010) **Current Biology**, 20(13):1209-15.
63. Neely GG, Hess A, Costigan M, **Keene AC**, Goulas S, Langeslag M, Griffith RS, Belfer I, Smith, SB, Gupta V, Xia X, Aman S, Arora S, Sarangi R, Debasis D, Novatchkova M, Pospisilik JA, Rosenzweig M, Truong D, Elling U, Schramek D, Angjeli B, Zoranovic T, Cronin S, Dietzl G, , Subramaniam S, Garrity PA, Bellen HJ Woolf CJ and Penninger JM et al. A genome wide *Drosophila* screen for heat nociception identifies A2D3 as an evolutionarily-conserved pain gene. (2010) **Cell**. 143 (4);628-38.
64. Neely GG, Kuba K, Amann S, Isobe K, Zhang L, Cammarato A, Elmen L, Gupta V, Arora S, Srangi R, Dan D, Fujisawa S, Usami T, Xia C, **Keene AC**, Pospisilik A, Elling U, Berger C, Novatchkova M, Koglgruber R, Isobe M, Imai Y, Subramaniam S, Kimura A, Bodmer R, and Penninger JM. A global *in vivo* *Drosophila* RNAi screen identifies NOT3 as a key regulator of heart function. (2010) **Cell**. 14 (1): 142-153.
65. **Keene AC** and Waddell S. *Drosophila* olfactory memory: single genes to complex neural circuits. (2007) **Nature Neuroscience Reviews**. 8(5):341-54.
66. Krashes MJ*, **Keene AC***, Leung B, Armstrong JD, and Waddell S. Sequential use of mushroom body neuron subsets during *Drosophila* odor memory processing. (2007) **Neuron** 53(1):103-15.
67. **Keene AC***, Krashes MJ*, Leung B, Bernard JA, and Waddell S. *Drosophila* Dorsal Paired Medial neurons provide a general mechanism for memory consolidation. (2006) **Current Biology**. 16(15):1524-30.
68. Yu D, **Keene AC**, Srivatsan A, Waddell S and Davis RL. *Drosophila* DPM neurons form a delayed and branch-specific memory trace after olfactory classical conditioning. (2005) **Cell** 123 (5): 945-57.
69. **Keene AC** and Waddell S. *Drosophila* olfactory memory: Dopamine signals punishment? (2005) **Current Biology**. 15(22):R932-4.
70. **Keene AC**, Stratmann M, Keller A, Perrat PN, Vosshall LB, and Waddell, S. A benzaldehyde odor memory in *Drosophila* requires uniquely timed Dorsal Paired Medial neuron output. (2004) **Neuron** 44(3):521-33.
71. Ding H, Schwartz DS, **Keene A**, Affar E, Fenton L, Shi Y, Zamore PD, and Xu Z. Selective silencing by RNAi of a dominant allele that causes amyotrophic lateral sclerosis. (2003) **Aging Cell** 2(4):209-17.
72. **Keene AC**, Jones JE, Wade GN, and Corp ES. Forebrain sites of NPY action on estrous behavior in Syrian hamsters. (2003) **Physiology and Behavior** 78(4-5):711-6.
73. Jones JE, Pick RR, Davenport MD, **Keene AC**, Corp ES, and Wade GN. Disinhibition of female sexual behavior by a CRH receptor antagonist in Syrian hamsters. (2002) **American Journal of Physiology-Regulatory, Integrative and Comparative Physiology** 283(3):R591-7.

Works listed on Preprint Server and/or are Under Review:

1. Mack KL, Jaggard JB, Persons JL, Passow CN, Stahl BA, Ferrufino E, Tsuchiya D, Smith SE, Slaughter B, Kono JY, Kowalko JE, Rohner N, **Keene AC**, and McGaugh SE. Convergent dysregulation of the circadian clock in cavefish populations. **Biorxiv**, 2020.01.14.906628, and *under review*.
2. Patch A, Paz A, Holt K, Duboue ER, Kowalko JE, **Keene AC**, and Fily, Y. Kinematic analysis deconstructs the evolved loss of schooling behavior in cavefish. **Biorxiv**, 2020.01.31.929323, and *under review*.
3. Brown EB, Shah KD, Palermo J, Dey M, Dhanukar A, and **Keene AC**. Ir56d-dependent fatty acid responses in *Drosophila* uncovers taste discrimination between different classes of fatty acids. **Biorxiv**, 2020.05.27.119602, and *under review*.
4. O’Gorman M, Thakur S, Imrie G, Moran RL, Duboue E, Rohner N, McGaugh SE, **Keene AC**, and Kowalko JE. Pleiotropic function of the *oca2* gene underlies the evolution of sleep loss and albinism in cavefish. **Biorxiv**, 2020.09.27.314278, and *under review*.
5. Murakami K, Palermo J, Stanhope BA, and **Keene AC**. A screen for sleep and starvation resistance identifies a wake-promoting role for the auxiliary channel *unc79*. **Biorxiv**, 2021.02.08.43060.

Books, Book Chapters, and Education

1. **Keene AC** and Appelbaum L. “Sleep in fish models.” **The Handbook of Sleep**. Oxford University Press. *In press*.
2. Duboue ER and **Keene, AC**. “Investigating the evolution of sleep in the Mexican cavefish.” **The Biology and Evolution of the Mexican cavefish** (2015). 1st edition. San Diego. Academic Press/Elsevier, pp. 291-304.
3. Keene AC, Yoshizawa, M and McGaugh SE (2015). Biology and evolution of the Mexican cavefish. 1st edition, San Diego. Academic Press/Elsevier.
4. Paz A and **Keene AC**. What can a blind fish teach us about sleep. **Frontiers for Young Minds**. August, 2019. DOI: 10.3389

5. Heckscher E, **Keene AC**, Waddell; S and Zhang B. *Drosophila Neurobiology: A Laboratory Manual*, Cold Spring Harbor Press, *in Preparation* (Volume 2).

Current Research Support

NIH T34GM136486	05/2020-04/2025
URISE at Florida Atlantic University	
This proposal is to establish a program that supports undergraduates from underrepresented backgrounds to prepare for doctoral programs in biomedical science.	
Role: PI	\$1,300,000
NIH 1R01GM127872	05/2018-04/2022
Genetic architecture underlying natural variation in sleep loss and obesity.	
This award uses Mexican cavefish to identify novel genes regulating sleep and obesity.	
Role: MPI (MPI with McGaugh)	\$1,900,000
NSF-IOS 165674	09/2018-09/2021
The neural mechanisms of sleep loss in Mexican cavefish. This grant examines the role of Hypocretin in the evolution of cavefish sleep loss.	
Role: PI	\$333,000
NSF-DEB 174231	06/2018-06/2021
Contributions of albinism to fitness and the evolution of the Mexican cavefish.	
This grant examines the relationship between albinism and sleep loss in cavefish and develops gene-editing approaches in cavefish.	
Role: Co-PI (with Johanna Kowalko)	\$200,000
NIH R01HL143790	08/2018-07-2023
Elucidation of Genetic Effects on Sleep and Circadian Traits	
This grant seeks to identify novel sleep genes through human GWAS studies and validate targets in the fruit fly model.	
Role: MPI (with Phil German, Penn; Struan Grant, CHOP)	\$3,400,000
NIH R01HL143790S1	08/2019-07-2020
Elucidation of Genetic Effects on Sleep and Circadian Traits (Supplement)	
This is a supplement to identify sleep genes that contribute to the progression of Alzheimer's Disease.	
Role: MPI (with Phil German, Penn; Struan Grant, CHOP)	\$444,510
NIH R01DC017390	10/2018-09/2022
The Neural Basis for Fatty Acid Taste	
This grant seeks to identify receptors and neural mechanisms governing fatty acid taste in the fruit fly.	
Role: PI (with Anupama Dahanukar, UC-Riverside, MPI)	\$1,600,000
US-Israel BSF SP#2018-190	10/2018-9/2022
Dissection the function and evolution of the hypothalamic NTS-MCH-HCRT circuit	
This is a collaborative grant that examines the role of hypothalamic circuitry in the zebrafish and Mexican cavefish.	
Role: MPI (With Lior Appelbaum, Bar-Ilan University)	\$230,000
NSF-DBI 1852175	10/2019-09/2022
Site REU: Summer Integrative Neuroscience Experience in Jupiter	
This is a site award to support a summer Research Experience for Undergraduates program at FAU, Scripps, and the Max Planck Florida Institute.	
Role: PI	\$383,000
Florida Dept of Health 21A02	2/2020-2/2022
The Cellular Basis for Neurodegeneration in a Drosophila Model of Alzheimer's Disease	
This grant employs genomic and bioinformatic approaches in the fly taste system to identify novel regulators of Alzheimer's disease.	
Role: PI	\$200,000

Completed Research Support

NIH 1R01 NS085252	06/2014-12/2020
The role of neural <i>translin</i> in metabolic regulation of sleep. This grant examines neural mechanisms underlying the integration of sleep and metabolism.	
Role: PI	\$1,407,426
NIH 1R21NS105071	04/2018-08/2020
Development of genetic tools for functional analysis of sleep in cavefish.	
This proposal seeks to develop genetic tools to label sleep circuits and develop a brain atlas in cavefish.	
Role: PI	\$398,000
NSF IOS-1426265	06/2015-01/2019
The neural circuitry underlying taste memory. This grant investigates neural plasticity in dopamine neurons required for taste memory in the fruit fly.	
Role: PI	\$397,896
NIH R15 NS080155	05/2013-04/2016
Dietary and Endocrine regulation of Sleep: NIH Area Grant. The grant seeks to determine the dietary factors that regulate sleep in <i>Drosophila</i> .	
Role: PI	\$368,404
NSF IOS-125762	06/2013-05/2016
Evolutionary basis for sleep loss in the Mexican Cavefish: NSF/IOS Grant. This grant investigates the evolutionary and genetic basis for sleep loss in Mexican cavefish.	
Role: PI	\$347,041
NIH P20 GM103650	09/2013-09/2015
Center for Integrative Neuroscience: COBRE Program Grant, NIGMS. Target faculty on this program grant. My subproject investigates the relationship between sleep deprivation and stress in fruit flies.	
Role: Project Leader/Target Faculty	\$424,000
NIH P20 GM103513	08/2014-08/2015
Generating a molecular fingerprint for <i>Drosophila</i> Peptidergic neurons. This is a pilot grant award for single-cell analysis that is a component of a COBRE award to Kent Sanders.	
Role: Subaward recipient	\$50,000
NIH 5P20RR016464	07/2011-08/2013
Nevada IDEa Network of Biomedical Research Excellence: INBRE Program Grant, NIGMS. Target faculty on this program grant. My subproject investigates the neural basis for memory loss in sleep-deprived fruit flies.	
Role: Project Leader/Target Faculty	\$238,000
Swiss NSF, Systems X	04/2013-04/2018
SynaptiX-The Systems Biology of Forgetting.	
This grant seeks to understand the neurological basis for forgetting memories.	
Role: Co-PI, with Simon Sprecher, University of Fribourg)	\$1,950,000
NIH F32GM086207	09/2008-07/2011
Postdoctoral NRSA with advisor Justin Blau: Genetic dissection of larval light avoidance.	
This fellowship aimed to identify the neural circuitry regulating circadian rhythms and light avoidance in <i>Drosophila</i> larvae.	
Role: Trainee/PI	
HFSP LT0061	09/2007-08/2008
Postdoctoral Human Frontiers Long-Term Fellowship with advisor Barry Dickson.	
Identification of courtship song-specific fruitless neurons in <i>Drosophila</i>.	

This fellowship aimed to establish a high-throughput assay for acquisition and analysis of courtship song.
Role: Trainee/PI

NIH F31MH073311

09/2004-09/2007

Predoctoral NRSA with advisor Scott Waddell: **The role of acetylcholine in *Drosophila* memory.**

The grant investigated the role of acetylcholine release from extrinsic mushroom body neurons in memory consolidation.

Role: Trainee/PI

Awards and Honors

2019 Kavli Fellow

2019 FAU Researcher of the Year Award

2018 FAU Division of Research Mentorship Award

2018 FAU College of Science Teaching Award (Northern Campuses)

2016 International Behavioral and Neurogenetics Society (IBANGS) Young Investigator Award

2015 Sleep Research Society Young Investigator NIDDK/NIH Award

2014 Gordon Research Conference, Chronobiology, Junior Investigator Presentation Award

2006 Dean's Award for Outstanding Doctoral Thesis, UMass Medical School

2005 Dean's Award for Outstanding Research Achievement, UMass Medical School

Courses Taught (Since 2011)

Fall 2011: Neuroscience Journal Club

Spring 2012: Neurobiology

Fall 2012: Introduction to Neuroscience

Spring 2013: Neurobiology

Fall 2014: Techniques in Neuroscience

Spring 2015: Neurobiology

Fall 2016: Comparative Animal Behavior. Sections in Jupiter, Boca and Davie

Fall 2017: The Life and Science of Oliver Sacks, Jupiter

Spring 2018: Comparative Animal Behavior. Sections in Jupiter, Boca and Davie

Fall 2018: The Life and Science of Oliver Sacks, Boca

Spring 2019: Comparative Animal Behavior. Sections in Jupiter, Boca and Davie

Fall 2020: Laboratory Basics (U-RISE NIH Training Course)

Spring 2021: Intro to Biomedical Science (U-RISE NIH Training Course)

Trainees outcomes (Selected, including pre-FAU trainees)

2014-2020 James Jaggard, Doctoral Student, Current Postdoc in Philippe Mourrain's lab at Stanford

2015-2019, Bethany Stahl, Postdoc. Currently Executive Director of Campus Operations, FAU-Jupiter

2011-2015, Pavel Masek, Postdoc. Currently Assistant Professor at Binghamton University

2012-2015, Masato Yoshizawa, Postdoc, Currently Assistant Professor at University of Hawai'i

2013-2018, Maria Yurgel, PhD student, Currently Postdoc in Samer Hattar's lab at NIH

2015-2017, John Tauber, Technician, Currently PhD Student in Neurobiology at MIT

2014-2017, Melissa Slocumb, Undergrad/MS student, Currently technician at Stanford Medical School

2013-2017, Beatriz Robinson, Undergrad/Technician, Currently PhD student at Stanford Neurobiology

2012-2015, Kurtresha Worden, Undergrad, Currently PhD student at UC-Berkeley MCB, and HHMI Gilliam Fellow

2014-2015 Josue Regalado, Undergrad, Currently PhD student at Rockefeller University

Service and Professional Development

Service to the Institution

Outreach and FAU Service

2015-2019, Co-Director, Neuroscience and Behavior B.S. Program (FAU)

2016 Co-Chair, Hiring committee for Assistant Professor, Department of Psychology

2016, Hiring committee for Assistant Professor, Honors College

2017, Hiring committee for Assistant Professor, Honors College

2017 Co-Chair, Hiring committee for Assistant Professor, Department of Psychology

2017- Organizer, Flies on the Beach/South Florida Fly Meeting hosted at FAU

2017- Present, Osher Lifelong Learning Scholarship Committee

2018-Present, College of Science Seed Funding Committees

2020-Present: Division of Research Advisory Council

2018-Present: Integrative Biology and Neuroscience PhD Program Committee
2019-Present: Co-Director, STEM Innovation and Inclusion Program (SIIP) at FAU

Service to the Discipline

2015-Instructor, Cold Spring Harbor Neurobiology of Drosophila Course
2016-Present, Co-Director, Cold Spring Harbor Neurobiology of Drosophila Course
2016, Ad hoc member, NIH Neuroendocrinology, Neuroimmunology, Sleep, and Rhythms Study Section
2016, NSF-Integrative Organismal Systems, Modulation Study Section
2015, 2019 and 2021, Organizer, *Astyanax* International Meeting
2019 NSF-Integrative Organismal Systems, Modulation Study Section
2016-Present, Standing Member, NIH Molecular Neurogenetics Study Section
2019-Present, Affiliate, *BioRxiv*, Cold Spring Harbor Press