

GREGORY T. MACLEOD

CURRICULUM VITAE

Professor of Cellular Neuroscience
Wilkes Honors College
Florida Atlantic University
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Education

<i>Ph.D.</i>	University of Sydney	1995-1999	Physiology
<i>M.B.A.</i>	AGSM - Australian Graduate School of Management	1989-1990	General Management
<i>B.Sc. Hons.</i>	University of Sydney	1986	Plant Physiology & Biophysics
<i>B.Sc.</i>	University of Sydney	1983-85	Cell Biology & Plant Physiology

Employment History

Professor	2020-present	Florida Atlantic University, Wilkes Honors College
Associate Professor	2014-20	Florida Atlantic University, Wilkes Honors College & Dept. of Biology
Assistant Professor	2007-13	University of Texas Health Science Center at San Antonio (UTHSCSA), Dept. of Physiology
Postdoctoral Fellow	2004-06	University of Arizona, Div. of Neurobiology
Postdoctoral Fellow	2000-04	University of Toronto, Dept. of Physiology
Postdoctoral Fellow	1999-00	University of Sydney, Dept. of Physiology
Graduate Student	1994-99	University of Sydney, Dept. of Physiology
Management / Consulting	1991-93	Dalton Pacific, DataView Solutions, Godfrey Pembroke Sydney, Australia
Research Assistant	1987-88	University of Sydney, Neurobiology Research Centre

Memberships in Professional and Scientific Societies

The Genetics Society of America
The Society for Neuroscience
The Biophysical Society

Extramural Peer Review Service

Funding Agencies

- National Institutes of Health (NIH) - Fellowship F03A: 2016-2017, 2019, 2022-2023
- SYN: 2019
- ZRG1 MDCN: 2016-2017
- BPNS: 2017
- CMND: 2012-2013
- National Science Foundation (NSF) - IOS: 2008-2012, 2020, 2022
- Deutsche Forschungsgemeinschaft (DFG) - 2018-2019
- Italian Ministry of Health (MOH) - 2010-2011

Journals

Aging Cell, Brain Research, Cell Reports, Current Biology, eLife, eNeuro, European Journal of Neuroscience, Frontiers in Synaptic Neuroscience, Journal of Insect Physiology, Journal of Neurogenetics, Journal of Neurophysiology, Journal of Neuroscience, JoVE, Microscopy & Microanalysis, Molecular Biology of the Cell, Nature, Nature Protocols, Neurochemistry International, Neuroscience Letters, PLoS Biology, PLoS One, PNAS, Synapse

Extramural Research Funding

Current Extramural Funding (NIH)

Title: Mitochondrial Interactions with the Plasmamembrane: Genetic Underpinnings and Functional Consequences at *Drosophila* Nerve Terminals.

Reference: NIH R01 NS123377

Role: PI (25% effort)

Dates: 07/15/21 – 06/30/26

Total Funds Requested: \$1,845,759

Title: The Impact of Synaptic Cleft pH Fluctuations on Short-Term Synaptic Plasticity

Reference: NIH R01 NS103906 - awarded in the first year as an R56

Role: PI (25% effort)

Dates: 02/01/2018 – 01/31/2024 NCE

Total Amount Awarded: \$1,680,856

Granting Agency: National Institute of Neurological Disorders and Stroke (NINDS)

Previous Extramural Funding (last 5 years)

Title: Neuronal Mechanisms Controlling Number and Function of Presynaptic Mitochondria

Reference: NIH R01 NS061914 – Competing Renewal

Role: PI (30% effort)

Dates: 11/01/2013-06/30/2018 (last year in NCE)

Total Amount Awarded: Total \$1,223,869 (includes a 1 year diversity supplement)

Granting Agency: National Institute of Neurological Disorders and Stroke (NINDS)

Title: Molecular mechanism of synapse assembly and function
Reference: NIH R01 NS078179
Role: Co-PI: Sub Awardee (8% effort) (The PI is Kate O'Connor-Giles at Brown University)
Dates: 12/15/2018 – 11/30/2022
Total Amount Awarded: \$1,795,860 (\$155,786 to FAU)
Granting Agency: National Institute of Neurological Disorders and Stroke (NINDS)

Refereed Journal Articles

1. Danielle V.R., Crill, S., Oliva, C., Restifo, M.G., Joseph, R., Joseph, K., Nguyen, K.C.Q. Hall, D.H., Fily, Y., Macleod, G.T. (2023) Ultrastructural analysis reveals mitochondrial placement independent of synapse placement in fine caliber *C. elegans* neurons. Submitted *bioRxiv*.
2. Justs, K.A., Sempertegui, S., Riboul, D.V., Oliva, C.D., Durbin, R.J., Crill, S., Su, C., Renden, R.B., Fily, Y., Macleod, G.T. (2023) Mitochondrial phosphagen kinases support the volatile power demands of motor nerve terminals. *bioRxiv*; in revision at the **Journal of Physiology**.
3. He, K., Han, Y., Li, X., Hernandez, R.X., Riboul, D.V., Fegghi, T., Justs, K.A., Mahneva, O., Perry, S., Macleod, G.T. Dickman, D. (2023) Physiologic and nanoscale distinctions define glutamatergic synapses in tonic vs phasic neurons. **Journal of Neuroscience**. Vol.43 pp.4598-4611.
4. Justs, K.A., Lu, Z., Chouhan, A.K., Borycz, J.A., Lu, Z., Meinertzhagen, I.A., Macleod, G.T. (2022) Presynaptic mitochondrial volume and packing density scale with presynaptic power demand. **Journal of Neuroscience**. Vol.42: pp.954-967.
5. Fegghi, T., Hernandez, R.X., Stawarski, M., Thomas, C.I., Kamasawa, N., Lau, A.W.C., Macleod, G.T. (2021) Computational modeling predicts ephemeral acidic microdomains in the glutamatergic synaptic cleft. **Biophysical Journal**. Vol.120: pp.5575-5591.
6. Han, T.H., Vicidomini, R., Ramos, C.I., Wang, Q., Nguyen, P., Jarnik, M., Lee, C.H., Stawarski, M., Hernandez, R.X., Macleod, G.T., Serpe, M. (2020) Neto- α controls synapse organization and homeostasis at the *Drosophila* neuromuscular junction. **Cell Reports**. Vol.32: pp.1-17.
7. Stawarski, M., Hernandez, R.X., Fegghi, T., Borycz, J.A., Lu, Z., Agarwal, A.B., Reihl, K.D., Tavora, R., Lau, A.W.C., Meinertzhagen, I.A., Renden R., Macleod G.T. (2020) Neuronal glutamatergic synaptic clefts alkalinize rather than acidify during neurotransmission. **Journal of Neuroscience**. Vol.40: pp.1611-1624.
8. Gratz, S.J., Goel, P., Bruckner, J.J., Hernandez, R.X., Khateeb, K., Macleod, G.T., Dickman, D., O'Connor-Giles, K.M. (2019) Endogenous tagging reveals differential regulation of Ca²⁺ channels at single AZs during presynaptic homeostatic potentiation and depression. **Journal of Neuroscience**. Vol.39: pp.2416-2429.
9. Stawarski, M., Justs, K.A., Hernandez, R.X., Macleod, G.T. (2018) The application of 'kisser' probes for resolving the distribution and microenvironment of membrane proteins *in situ*. **Journal of Neurogenetics**. Vol.32: pp.236-245.
10. Ugur, B., Bao, H., Stawarski, M., Duraine, L.R., Zuo, Z., Lin, Y.Q., Neely, G.G., Macleod, G.T., Chapman, E.R., Bellen, H.J. (2017) The Krebs cycle enzyme isocitrate dehydrogenase 3A couples mitochondrial metabolism to synaptic transmission. **Cell Reports**. Vol.21: pp.3794-3806.

11. Rossano, A.J., Kato, A., Minard, K.I., Romero, M.F., Macleod G.T. (2017) Na⁺/H⁺-exchange via the *Drosophila* vesicular glutamate transporter (DVGLUT) mediates activity-induced acid efflux from presynaptic terminals. **Journal of Physiology**. Vol.595: pp.805-824.
12. Lu, Z., Chouhan, A.K., Borycz, J.A., Lu, Z., Rossano, A.J., Brain, K.L., Zhou, Y., Meinertzhagen, I.A., Macleod, G.T. (2016) High-probability neurotransmitter release sites represent an energy-efficient design. **Current Biology**, Vol.26: pp.2562-2571.
13. Wong C-O., Lin Y-Q., Chen K., Chao Y., Duraine L., Lu Z., Yoon W-H., Sullivan J-M., Broadhead G.T., Sumner C.J., Lloyd T.E., Macleod G.T., Bellen H.J. & Venkatachalam K. (2014) A TRPV channel in *Drosophila* motor neurons regulates presynaptic resting Ca²⁺ levels, synapse growth, and synaptic transmission. **Neuron**. Vol.84: pp.764-777.
14. Shi Y., Ivannikov M.V., Walsh M.E., Liu Y., Zhang Y., Jaramillo C.A., Macleod G.T., Van Remmen H. (2014) The lack of CuZnSOD leads to impaired neurotransmitter release, neuromuscular junction destabilization and reduced muscle strength in mice. **PLoS One**. Vol.9, e100834
15. Grygoruk A., Chen A., Martin C.A., Lawal H.O., Fei H., Gutierrez G., Biedermann T., Najibi R., Hadi R., Chouhan A.K., Murphy N.P., Schweizer F.E., Macleod G.T., Maidment N.T. & Krantz D.E. (2014) The redistribution of *Drosophila* vesicular monoamine transporter mutants from synaptic vesicles to large dense-core vesicles impairs amine-dependent behaviors. **Journal of Neuroscience**. Vol.34, pp.6924-6937.
16. Daniels R.W., Rossano A.J., Macleod G.T., Ganetzky B. (2014) Expression of multiple transgenes from a single construct using viral 2A peptides in *Drosophila*. **PLoS One**. Vol.9, e100637.
17. Sakellariou G.K., Davis C.S., Shi Y., Ivannikov M.V., Zhang Y., Vasilaki A., Macleod G.T., Richardson A., Van Remmen H., Jackson M.J., McArdle A. & Brooks S.V. (2014) Neuron-specific expression of CuZnSOD prevents the loss of muscle mass and function that occurs in homozygous CuZnSOD knockout mice. **FASEB Journal**. Vol.28, pp.1666-1681.
18. Ivannikov M.V. & Macleod G.T. (2013) Mitochondrial free Ca²⁺ levels and their effects on energy metabolism in *Drosophila* motor nerve terminals. **Biophysical Journal**. Vol.104, pp.2353-2361.
19. Rossano, A.J., Chouhan A.K. & Macleod G.T. (2013) Genetically-encoded pH-indicators (GEpHIs) reveal activity-dependent cytosolic acidification of *Drosophila* motor nerve termini *in vivo*. **Journal of Physiology**. Vol.591, pp.1691-1706.
20. Rawson, J.M., Kreko, T., Davidson, H., Mahoney, R., Bokov, A., Chang, L., Gelfond, J., Macleod G.T. & Eaton, E.A. (2012) Effects of diet on synaptic vesicle release in dynactin complex mutants: a mechanism for improved vitality during motor disease. **Aging Cell**. Vol.11, pp.418-427.
21. Chouhan A.K., Ivannikov M.V., Lu Z., Sugimori M., Llinas R.R. & Macleod G.T. (2012) Cytosolic calcium coordinates mitochondrial energy metabolism with presynaptic activity. **Journal of Neuroscience**. Vol.32, pp.1233-1243.
22. Macleod G.T. (2012) Calcium imaging at the *Drosophila* larval NMJ. **Cold Spring Harbor Protocols**. No.7. July 2nd.
23. Macleod G.T. (2012) Topical application of indicators for calcium imaging at the *Drosophila* larval NMJ. **Cold Spring Harbor Protocols**. No.7. July 2nd.
24. Macleod G.T. (2012) Forward-filling of dextran-conjugated indicators for calcium imaging at the *Drosophila* larval NMJ. **Cold Spring Harbor Protocols**. No.7. July 2nd.

25. Macleod G.T. (2012) Direct injection of indicators for calcium imaging at the *Drosophila* larval NMJ. **Cold Spring Harbor Protocols**. No.7. July 2nd.
26. Macleod G.T. (2012) Imaging and analysis of nonratiometric calcium indicators at the *Drosophila* larval NMJ. **Cold Spring Harbor Protocols**. No.7. July 2nd.
27. George A.A., Macleod G.T. & Zakon H.H. (2011) Calcium-dependent phosphorylation regulates neuronal stability and plasticity in a highly precise pacemaker nucleus. **Journal of Neurophysiology**. Vol.106, pp.319–331.
28. Shakiryanova D., Morimoto T., Zhou C., Chouhan A.K., Sigrist S.J. Nose A., Macleod G.T., Deitcher D.L. & Levitan, E.S. (2011) Differential control of presynaptic CaMKII activation and translocation to active zones. **Journal of Neuroscience**. Vol.31, pp.9093–9100.
29. Chouhan A.K., Zhang J., Zinsmaier K.E. & Macleod G.T. (2010) Presynaptic mitochondria in functionally different motor neurons exhibit similar affinities for Ca²⁺ but exert little influence as Ca²⁺ buffers at nerve firing rates *in situ*. **Journal of Neuroscience**. Vol.30, pp.1869-1881.
30. Russo G.J., Louie K., Wellington A., Macleod G.T., Hu F., Panchumarthi S., & Zinsmaier K.E. (2009) *Drosophila* Miro is required for both anterograde and retrograde axonal mitochondrial transport. **Journal of Neuroscience**. Vol.29, pp.5443-5455.
31. Lagow R.D., Bao H., Cohen E.N., Daniels R.W., Zuzek A., Williams W.H., Macleod G.T., Sutton R.B. & Zhang B. (2007) Modification of a hydrophobic layer by a point mutation in syntaxin 1A regulates the rate of synaptic vesicle fusion. **PLoS Biology**. Vol.5(4), e72.
32. Rossano A.J. & Macleod G.T. (2007) Loading *Drosophila* nerve terminals with Ca²⁺-indicators. **Journal of Visualized Experiments**. Vol.6. <http://www.jove.com/video/250>
33. Macleod G.T., Chen L., Karunanithi S., Peloquin J.B., Atwood H.L., McRory J.E., Zamponi G.W. & Charlton M.P. (2006) The *Drosophila cac^{ts2}* mutation defines an element critical for inactivation in Ca_v2.1 channels. **European Journal of Neuroscience**. Vol.23, pp.3230-3244.
34. Guo[†] X., Macleod[†] G.T., Wellington A., Hu F., Panchumarthi S., Schoenfield M., Marin L., Charlton M.P., Atwood H.L. & Zinsmaier K.E. (2005) The GTPase dMiro is required for axonal transport of mitochondria to *Drosophila* synapses. **Neuron**. Vol.47, pp.379-393. [†] *Equal author contribution*.
35. Bao H., Daniels[†] R.W., Macleod[†] G.T., Charlton M.P., Atwood H.L. & Zhang B. (2005) AP180 maintains the distribution of synaptic and vesicle proteins in the nerve terminal and indirectly regulates the efficacy of Ca²⁺-triggered exocytosis. **Journal of Neurophysiology**. Vol.94, pp.1888-1903.
36. Babcock M., Macleod G.T., Leither J. & Pallanck L. (2004) Genetic analysis of soluble N-ethylmaleimide-sensitive factor attachment protein function in *Drosophila* reveals positive and negative secretory roles. **Journal of Neuroscience**. Vol.24, pp.3964-3973.
37. Macleod G.T., Marin L., Charlton M.P. & Atwood H.L. (2004) Synaptic vesicles: test for a role in presynaptic calcium regulation. **Journal of Neuroscience**. Vol.24, pp.2496-2505.
38. Macleod G.T., Suster M.L., Charlton M.P. & Atwood H.L. (2003) Single neuron activity in the *Drosophila* larval CNS detected with calcium indicators. **Journal of Neuroscience Methods**. Vol.127, pp.167-178.
39. Macleod G.T., Hegstöm-Wojtowicz M., Charlton M.P. & Atwood H.L. (2002) Fast calcium signals in *Drosophila* motor neuron terminals. **Journal of Neurophysiology**. Vol.88, pp.2659-2663.

40. Macleod G.T., Dickens P.A. & Bennett M.R. (2001) Formation and function of synapses with respect to Schwann cells at the end of motor-nerve terminal branches on mature amphibian (*Bufo marinus*) muscle. **Journal of Neuroscience**. Vol.21, pp.2380-92.
41. Bennett M.R., Farnell L., Gibson W.G., Macleod G.T. & Dickens P. (2000) Quantal potential fields around individual active zones of amphibian motor-nerve terminals. **Biophysical Journal**. Vol.78, pp.1106-1118.
42. Macleod G.T., Gan J.B. & Bennett M.R. (1999) Vesicle-associated proteins and quantal release at single active zones of amphibian (*Bufo marinus*) motor-nerve terminals. **Journal of Neurophysiology**. Vol.82, pp.1133-1146.
43. Macleod G.T., Farnell L., Gibson W.G. & Bennett M.R. (1999) Quantal secretion and nerve-terminal cable properties at neuromuscular junctions in an amphibian (*Bufo marinus*). **Journal of Neurophysiology**. Vol.81, pp.1135-1146.
44. Macleod G.T., Khurana V., Gibson W.G. & Bennett M.R. (1998) Probability of quantal secretion and the mobilization of vesicles at the active zones of endplates. **Journal of Theoretical Biology**. Vol.191, pp.323-324.
45. Macleod G.T., Lavidis N.A. & Bennett M.R. (1994) Calcium dependence of quantal secretion from visualized sympathetic nerve varicosities on the mouse vas deferens. **Journal of Physiology**. Vol.480, pp.61-70.

Book Chapters

46. Macleod G.T. & Ivannikov M.V. (2017). Examining mitochondrial function at synapses *in situ*. In, Yuriy M. Usachev & Stefan Strack (Eds.), **Neuromethods: Techniques to investigate mitochondrial function in neurons**. Springer Science + Business Media. Vol.123, pp.279-297.
47. Macleod G.T. (2010) Calcium Imaging. In, M. Freeman, S. Waddell, & B. Zhang (Eds.), **Drosophila Neurobiology Methods: A Laboratory Manual**. Woodbury, NY. Cold Spring Harbor Laboratory Press, pp.315-341.

Other (invited article previews)

48. Ivannikov M.V., Harris K.M. & Macleod G.T. (2010) Mitochondria: enigmatic stewards of the synaptic vesicle reserve pool. **Frontiers in Synaptic Neuroscience**. 2, Article 145.
49. Macleod G.T. & Zinsmaier K.E. (2006) Synaptic homeostasis on the fast track. **Neuron**, Vol.52, pp.569-571.

Patents

Provisional Patent Applications - with the U.S. Patent & Trademark Office

Phosphagen System Modulators and Uses Thereof

Application No.: 63/433,907

Filing Date: December 20th 2022

Applicant: Florida Atlantic University Board of Trustees

Inventor: Gregory T. Macleod et al.

Non-Refereed Presentations and Proceedings. (last 5 years)

Invited National Presentations (no invitations accepted March 2020 to Feb 2022 due to Covid19)

1. *What Can Worms and Fruit Flies Tell Us About Neuronal Control of Mitochondria?*
Jan. 2023. Texas A&M University. Host – Alex Keene
2. *How do neurons control mitochondrial form, function and distribution to support neural function?*
Nov. 2022. The Florida Institute of Technology. Host – Tristan Fiedler
3. *Neuronal bioenergetics: Coordinating mitochondrial number and function with the energy requirements of nerve terminals.*
Oct. 2018. The University of Pittsburgh School of Medicine. Host – Edwin Levitan
4. *Neuronal bioenergetics: Coordinating mitochondrial number and function with the energy requirements of nerve terminals.*
Oct. 2018. The University of Texas Health Science Center at Houston, McGovern Medical School.
Host – Kartik Venkatachalam
5. *Alkalinization of the synaptic cleft during burst firing; a phenomenon that ameliorates frequency depression.*
Feb. 2018. The University of Miami, Miller School of Medicine. Host – Daniel Isom

Courses Taught Previously at UTHSCSA

At the UTHSCSA graduate school, from 2006-2013, I was involved in teaching 5 courses either as a lecturer or a director; with over 20 contact hours per year as a lecturer and directing two courses with a total of 52 contact hours. I was also a director of the *Drosophila* Neurobiology summer course at the **Cold Spring Harbor Laboratory (CSHL)** with 160 contact hours; 2012-2013.

Course Based Teaching

INTD5000 - Fundamentals of Bio-Medical Science (Select Topics in Biophysics and Genetics)
INTD5040 - Molecular, Cellular & Developmental Neuroscience (Neurotransmission and Plasticity)
PHYL5043 - Respiratory and Renal Physiology
INTD6008 - Advanced Cell and Molecular Biology: Mitochondria

Courses Directed

PHYL5041 - Excitable Membranes (2010 - present)
INTD5040 - Molecular, Cellular and Developmental Neuroscience (2009 - present)

Courses Taught at FAU

I teach, or mentor, in the following courses at the Wilkes Honors College on the MacArthur campus:

Honors Cell Biology (PCB4102)	4	credit hours	Spring semester	2014-23
Honors Biology Research (BSC4915)	1-3	credit hours	Spring, Summer & Fall	2014-23
Honors Biology Thesis (BSC4970)	3	credit hours	Spring, Summer & Fall	2014-23
Honors Neuro Diseases (BSC4905)	1-3	credit hours	Spring, Summer & Fall	2014-23
Directed Ind. Res. (CoS BSC4910)	1-3	credit hours	Spring, Summer & Fall	2014-23
Internship (ISC4947 / CoS IDS3941)	1-3	credit hours	Spring, Summer & Fall	2014-23

Research Supervision of Graduate Students at FAU (not including UTHSCSA, or extramural students)

1. Zhongmin Lu, PhD Feb. 2010 – Sep. 2015
Title: *Presynaptic determinants of synaptic strength and energy efficiency at Drosophila NMJs*
My Role: **Chair** of dissertation committee and direct supervisor
2. Monica Risely, PhD May 2014 – Mar. 2018
Title: *Characterizing electroconvulsive seizure recovery time using the invertebrate model systems *Caenorhabditis elegans* and *Drosophila melanogaster**
My Role: Regular member of dissertation committee
3. Priyanka Kakad, PhD Jun. 2014 – Jun. 2018
Title: *Nuclear translocation and function of LICAM in vivo using *Drosophila melanogaster**
My Role: Regular member of dissertation committee
4. Keith Murphy, PhD Jun. 2014 – Mar. 2018
Title: *Genetic and neuronal integration of sleep and feeding*
My Role: Regular member of dissertation committee
5. Tyrone Penserga (PhD, incomplete) Sep. 2014 – 2019
Title: Yet to be determined
My Role: Regular member of dissertation committee
6. Kent Fairchild, MS Feb. 2014 – June 2016
Title: *Developmental effects of DPP_4 inhibition in *D. melanogaster**
My Role: Regular member of dissertation committee
7. Wesley Bollinger, PhD Fall 2015 – May 2018
Title: *Protecting synaptic function from acute oxidative stress:
A novel role for Big K⁺ (BK) channels and resveratrol-like compounds*
My Role: Regular member of dissertation committee
8. Karlis Justs, PhD Spring 2016 – July 2019
Title: *A framework for understanding power supply and demand in presynaptic nerve terminals*
My Role: **Chair** of dissertation committee and direct supervisor
9. Timothy Holford, PhD Spring 2016 – Summer 2021
Title: *The contribution of SST interneurons to the PTEN model of autism spectrum disorder*
My Role: Regular member of dissertation committee
10. Melissa Slocumb, MS Spring 2016 – Summer 2017
Title: *Circadian and neuronal regulation of sleep metabolic rate*
My Role: Regular member of dissertation committee
11. Maria Yurgel, PhD Spring 2016 – Fall 2018
Title: *The role of leucokinin neurons in the metabolic regulation of sleep.*
My Role: Regular member of dissertation committee
12. James Jaggard, PhD Spring 2016 – Summer 2020
Title: *Genetic and neuroanatomical mechanisms of evolutionary sleep ...*
My Role: Regular member of dissertation committee

13. Kaz Murakami, PhD Spring 2016 – Spring 2021
 Title: *Genetic screens identify novel regulators of sleep and ...*
 My Role: Regular member of dissertation committee
14. Ingo Gotthard, PhD Summer 2016 – Fall 2022
 Title: *The effects of autism-associated TBR1 haploinsufficiency on amygdala...*
 My Role: Regular member of dissertation committee
15. Roberto Hernandez (intended PhD) Spring 2018 – present
 Title: Yet to be determined
 My Role: **Chair** of dissertation committee and direct supervisor
16. Kerriann Badal (intended PhD) Fall 2018 – present
 Title: Yet to be determined
 My Role: Regular member of dissertation committee
17. Danielle Riboul (intended PhD) Spring 2019 – present
 Title: Yet to be determined
 My Role: **Chair** of dissertation committee and direct supervisor
18. Evan Lloyd (intended PhD) Spring 2019 – present
 Title: Yet to be determined
 My Role: Regular member of dissertation committee
19. Alexandra Paz, PhD Spring 2019 – Summer 2023
 Title: *Evolved differences in interaction rules underlie the loss of social ...*
 My Role: Regular member of dissertation committee
20. Touhid Fegghi, PhD Spring 2019 – Summer 2023
 Title: *pH dynamics within the Drosophila synaptic cleft during activity*
 My Role: **Co-Chair** of dissertation committee and direct supervisor
21. Sergio Sempertegui (intended PhD) Fall 2019 – present
 Title: Yet to be determined
 My Role: **Co-Chair** of dissertation committee and direct supervisor
22. Zainab Alshakarchi, MS Fall 2020 – Fall 2021
 Title: *Optogenetics control in Drosophila reward circuitry*
 My Role: Regular member of dissertation committee
23. Yasmine Zerrouki, MS Fall 2020 – Spring 2021
 Title: *Neuroprotective effects of various antioxidants in D melanogaster*
 My Role: Regular member of dissertation committee
24. Ian Gaudet (intended PhD) Spring 2022 - present
 Title: Yet to be determined
 My Role: Regular member of dissertation committee
25. Monil Shah (intended PhD) Fall 2022 - present
 Title: Yet to be determined
 My Role: **Co-Chair** of dissertation committee

26. Ji Heon Han (intended PhD) Spring 2023 - present
Title: *Neurobiology of self-medication in Drosophila*
My Role: Regular member of dissertation committee

Research Thesis Supervision of Undergraduate Students at FAU (within my laboratory: **numbers**)

1. Christina Collins - Spring '15

Title: *A Novel Reporter: Construction of a Ratiometric Fluorescent Voltage-Sensitive Protein to Report Inner Mitochondrial Membrane Potential.*

2. Brandon Gilliland – Fall '15

Title: *Nf1 Mutations Impair Memory-Related Plasticity in the Drosophila Melanogaster Mushroom Body.*

3. Kellie Konicki - Fall '15

Title: *Investigating Intellectual Disability (ID) and Autism Spectrum Disorder (ASD) Characteristic Behaviors in the SYNGAP1 Mouse Model.*

4. Don Woody - Spring '16

Title: *Developing Genetically Encoded Ratiometric Fluorescent Probes to Investigate Mitochondrial Voltage and pH in vivo.*

5. Gabrielle Fontinelle – Spring '16

Title: *The application of opsins to control mitochondrial metabolism: Stage I – testing for the presence of opsins in the inner mitochondrial membranes of transgenic fruit flies.*

6. Roberto Hernandez – Spring '16

Title: *Using Drosophila as a model in which to examine the cellular basis of a neurological deficit caused by a novel mutation in isocitrate dehydrogenase.*

7. Arthur Speziale – Spring '16

Title: *Construction and Use of Subcellular Probes for Investigating the Influence of pH Homeostasis on Short Term Synaptic Plasticity and Neurotransmission.*

8. Vincenzo Giovinazzo – Fall '16

Title: *Dissecting the Stability of Rhes; A striatal protein involved in Huntington Disease.*

9. Stacy Cabral – Spring '17

Title: *Identifying a novel genetic modifier in a mouse model of macrocephaly and autism.*

10. Remikie Harris – Spring '17

Title: *An Investigation into the Involvement of the Phosphagen System in Synaptic Vesicle Recycling.*

11. Viktoriya Kozlova – Spring '17

Title: *The Phosphagen System's Role in Energy Supply to Synaptic Terminals.*

12. Farrah Tygar – Spring '17

Title: *Environmental Enrichment and Social Recognition in PTEN+/- Mice.*

13. Erin Wade – Spring ‘17
Title: *Flow cytometric assay to measure nucleotide excision repair capacity in cell lines and blood.*
14. Spencer Webb – Spring ‘17
Title: *Neuron-Based Phenotypic Screening Assays for Therapeutic Discovery in Neuropsychiatric Disorders.*
15. Rachel Miller – Fall ‘17
Title: *Inhibition of *Dermatophilus congolensis* using topical products.*
16. Heather Gilchrist – Spring ‘18
Title: *In Search of Fear's Social Equilibrium: How Social Contagion and Social Buffering Compete in *D. melanogaster*.*
17. Regina Murthy – Spring ‘18
Title: *Mapping Mitochondrial Number and Morphology in the Brains of *Drosophila melanogaster* Models of Parkinson's Disease.*
18. Rubens Tavora – Spring ‘18
Title: *Analysis of expression and localization of OGT-1.*
19. Swathi Pisupati – Summer ‘18
Title: *The basolateral amygdala is necessary for the effects of social stress on methamphetamine seeking.*
20. Mariah Frances Calubag – Fall ‘18
Title: *Mapping Neurons within the CA1 Region of the Hippocampus Allocated to Context Memory.*
21. Sarah Soodeen – Spring ‘19
Title: *Combination of sulindac and oxidizing agents enhance cell death in breast cancer cells.*
22. Christian Alvarado – Spring ‘19
Title: *Apparatus for visual place learning through aversive conditioning in *Drosophila melanogaster*.*
23. Sarah Crill (CoS) – Spring ‘19
Title: *Identifying the endogenous expression pattern and subcellular location of Arginine Kinase in *D. melanogaster* motor neurons.*
24. Maria Mourino (CoS) – Spring ‘19
Title: *The mechanism of action underlying carbon dioxide anaesthesia in fruit flies.*
25. Benjamin LaFlamme – Summer ‘19
Title: *Protein splicing factors regulate the expression of a novel isoform of the *C. elegans* daf-2 insulin receptor.*
26. Ian Gaudet (CoS) – Summer ‘19
Title: *Thermodrome: A Novel Assay for Visuospatial Learning in *Drosophila*.*
27. Carmen-Maria Garcia – Summer ‘19
Title: *Description of Phenotypic Grooming Behavior in *Drosophila melanogaster* Model of Type 1 Neurofibromatosis.*

28. Christelle J. Alcinor – Summer ‘21
Title: *Detecting serotonin (5HT) in various species of marine sponges (phylum Porifera).*
- 29.** Reggie Joseph – Spring ‘22
Title: *An analysis of mitochondrial distribution across neuron types in C. elegans.*
30. Skylar Anthony – Spring ‘22
Title: *AMPA receptors are increased relative to NMDA receptors at thalamic to lateral amygdala synapses in the TBR1 mouse model of autism spectrum disorder*
31. Cypress Potter – Spring ‘22
Title: *Starvation assay of DSD and DILP mutated Drosophila*
- 32.** Maria Restifo – Spring ‘22
Title: *An ultrastructural analysis of the relationship between synapses and mitochondria across neuron types in C. elegans.*
- 33.** Rishiraj Bandi – Spring ‘22
Title: *Unraveling the mysteries of undiagnosed disorders with Drosophila CRISPR mutants*
- 34.** Kaisee Chung – Spring ‘22
Title: *Genetically-encoded fluorescent probes reveal presynaptic glutamate levels to be surprisingly low*
35. Emmy Weisenberg – Spring ‘22
Title: *Psychedelics in treatment-resistant psychiatric disorders*
- 36.** Frank Sigui – Fall ‘22
Title: *An investigation of neuronal cytosolic pH and mitochondrial energy metabolism in MDH2 Drosophila mutants*
- 37.** Carlos Oliva – Fall ‘22
Title: *The presynaptic role of phosphagen systems*
38. Thanh Ton – Spring ‘23
Title: *H3K9 methylation is involved in the long-term behavioral effects caused by amphetamine in Caenorhabditis elegans*
39. Andre Rajoo – Spring ‘23
Title: *The neuroprotective compound Ellagic Acid inhibits the effects induced by chronic amphetamine exposure*

Advising of Undergraduate Students at FAU

As a Wilkes Honors College faculty member I am expected to advise undergraduates 3 times a year, in early Fall, late Fall and late Spring. On each occasion I invite undergraduates to my office where I provide one-on-one advice on course selection and career objectives. I have been responsible for advising each of the 55 undergraduate students listed below, and have met with some of them up to 8 times. This advising is done in addition to advising undergraduates and graduate students doing research projects and theses.

Advisee Name	Started Advising
Tyler King	early Fall 2014
Courtney Hunt	early Fall 2014
Carmen-Maria Garcia	early Fall 2015
Maria Valdez-Palomino	early Fall 2015
Christian Alvarado	early Fall 2015
Arielle Schebovitz	early Fall 2015
Sarah Soodeen	early Fall 2015
Christopher Graham	early Fall 2015
Michael Chang	early Fall 2015
Frederick Brown	early Fall 2016
Camden Weist	early Fall 2016
Elizabeth Lanzon	early Fall 2016
Daniela Giachetti	early Fall 2016
Sanjay Venugopalan	early Fall 2016
Tasmiah Rahman	late Fall 2016
Haylee Trulson	late Fall 2016
Andrew Bryant	late Fall 2016
Vincenzo Giovinazzo	late Fall 2016
Rahat Verma	late Fall 2016
Tracey Tobkin	late Fall 2016
Michelle Nudel	late Spring 2017
Amado Vasquez	early Fall 2017
Zayne Orosz	early Fall 2017
Gillian Hebert	early Fall 2017
Abigail Parker	early Fall 2017
Yenia Guerrero	early Fall 2017
Luis Rivero	late Spring 2018
Milly Reyes Tarazona	early Fall 2018
Ewa Barnas-Lionarons	early Fall 2018
Alexandra Rosado Torres	early Fall 2018
Briana Magloire	early Fall 2018
Fredy Mendez	early Fall 2018
Shelly Davidashvilly	early Fall 2019
Bradley Drummond	early Fall 2019
Saul Vilchiz	early Fall 2019
Saadhana Sridharan	early Fall 2019
Rebecca Richar	early Fall 2019
Allyson Flores	early Fall 2019
Shivana Persaud	early Fall 2019
Christy Laflamme	early Fall 2020
Elizabeth Lanzon	early Fall 2020
Medilien Ishama	early Fall 2020
Allison Dobuler	early Fall 2020
Maria Monsalve	early Fall 2020
Claire Sanford	early Fall 2020
Emily Serrano	early Fall 2020
Kayla Siedlecki	early Fall 2020
Zoe Szilagyi	early Fall 2020
Nadia Sifuentes	early Spring 2022

Nicole Litvinchuk	early Spring 2022
Miabeth Gorodetzer-Edelman	early Spring 2022
Avinash Kanakam	early Spring 2022
Shivana Persaud	early Spring 2022
Emily Vonaldenbruck	early Spring 2022

Service and Professional Development

Service to the Institution (FAU only)

Wilkes Honors College service (started in Oct 2013)

2013-4

WHC Ad-hoc Search Committee for a biology faculty hire (regular member)

2014-5

WHC Academic Affairs Committee (regular member)

WHC Promotion & Tenure Committee (regular member)

2015

WHC Dean Search Committee (regular member)

WHC Promotion & Tenure Committee (regular member)

WHC Ad-hoc Committee making recommendations regarding a BS for the WHC (regular member)

2016

WHC Dean Search Committee (continued) (regular member)

WHC Business Manager Search Committee (regular member)

WHC Cell Biology Faculty Search Committee (co-chair)

WHC Genetics Faculty Search Committee (co-chair)

WHC Physics Faculty Search Committee (regular member)

WHC Academic Affairs Committee (regular member)

WHC Promotion & Tenure Committee (regular member)

2017

WHC Business Manager Search Committee (continued) (regular member)

WHC Physics Faculty Search Committee (continued) (regular member)

WHC Cell Biology Faculty Search Committee (continued) (co-chair)

WHC Genetics Faculty Search Committee (continued) (co-chair)

WHC Cell Biology Faculty Search Committee (to fill a 2nd position) (co-chair)

WHC Academic Affairs Committee (regular member)

WHC Curriculum Committee (regular member)

WHC Promotion & Tenure Committee (regular member)

2018

WHC Cell Biology Faculty Search Committee (continued) (co-chair)

WHC Curriculum Committee (regular member)

WHC Promotion & Tenure Committee (regular member)

Development Activity – presentation at a social event at the First Republic Bank

2019

WHC Curriculum Committee (regular member)

WHC Promotion & Tenure Committee (regular member)
WHC Biology Instructor Search Committee (regular member)
WHC Symposium Committee

2020

WHC Promotion & Tenure Committee (regular member)
WHC Biology Instructor Search Committee (regular member)
WHC Symposium Committee

2021

WHC Promotion & Tenure Committee (regular member)

2022

WHC Promotion & Tenure Committee (regular member)

2023

WHC Promotion & Tenure Committee (regular member)
University Faculty Senate (WHC representative)

University service (started in Oct 2013)

2014-5

Jupiter Life Sciences Initiative (JLSI) Faculty Search Committee (regular member)
Osher Lifelong Learning Institute (OLLI) Awards Committee (regular member)
Hosted seminars by out-of-state scientists on two separate occasions
URI: Undergraduate Research Curriculum Committee (URCC; regular member)

2015

Jupiter Life Sciences Initiative (JLSI) Faculty Search Committee (regular member)
Hosted seminars by an out-of-state scientist and an overseas (UK) scientist
URI: Undergraduate Research Curriculum Committee (URCC; regular member)

2016

Hosted seminars by out-of-state scientists on two separate occasions
URI: Undergraduate Research Curriculum Committee (URCC; regular member)

2017

Brain Institute Faculty Search Committee (regular member)
Hosted a seminar by an out-of-state scientist
URI: Undergraduate Research Curriculum Committee (URCC; regular member)

2018

Jupiter campus postdoctoral fellow representative
University Research Leadership Retreat (ad hoc member)
Hosted seminars by an out-of-state scientist and an overseas (UK) scientist
URI: Undergraduate Research Curriculum Committee (URCC; regular member)

2019

Jupiter campus postdoctoral fellow representative
International Max Planck Research School (IMPRS) recruiting retreat – 3 days (regular member)
FAU Research Development Committee (regular member)
Hosted seminar by an out-of-state scientist
URI: Undergraduate Research Curriculum Committee (URCC; regular member)
URC: University Research Committee (WHC representative)

2020

Jupiter campus postdoctoral fellow representative
International Max Planck Research School (IMPRS) recruiting retreat – 2 days (regular member)
URI: Undergraduate Research Curriculum Committee (URCC; regular member)

URC: University Research Committee (WHC representative)
University Research Council (DoR; regular member)
Graduate Neuroscience Training Program (GNTP) admissions committee (regular member)

2021

URC: University Research Committee (WHC representative)
International Max Planck Research School (IMPRS) recruiting retreat – 2 days (regular member)
University Research Council (DoR; regular member)
Graduate Neuroscience Training Program (GNTP) admissions committee (regular member)
Neuroscience Graduate Program (NGP) admissions committee (regular member)
Barry Goldwater Scholarship development - reviewer/feedback

2022

URC: University Research Committee (WHC representative)
University Research Council (DoR; regular member)
Neuroscience Graduate Program (NGP) admissions committee (regular member)
Barry Goldwater Scholarship development - reviewer/feedback
Grant reviewer for OURI funding applications
Hosted seminar by an out-of-state scientist

2023

University Faculty Senate (WHC representative)
URC: University Research Committee (WHC representative)
University Research Council (DoR; regular member)
Neuroscience Graduate Program (NGP) admissions committee (regular member)
College of Nursing Proposal Development Series – reviewer/feedback

Service to the Discipline/Profession (only since arriving at FAU - Oct 2013)

2013-14

Co-Director of the Drosophila Neurobiology course at Cold Spring Harbor Laboratory: 2012-14.

2014-15

Journal reviewer (1 journal: JoVE)
PhD dissertation reviewer for University of Queensland (UQ) PhD candidate (Kirat Chand)

2015

Journal review (3 journals: Journal of Neuroscience, European Journal of Neuroscience, PLoS One)
Professional/technical training of two visiting scholars from the University of Wisconsin Madison

2016

Journal reviewer (3 journals: eLife, Molecular Biology of the Cell, Synapse)
Reviewer for the National Institutes of Health (NIH) Special Emphasis Panel; ZRG1 MDCN-F
Reviewer for the National Institutes of Health (NIH) Fellowship Study Section F03A (Bethesda)

2017

Journal reviewer (1 journal: Proceedings of the National Academy of Sciences)
Professional/technical training of two visiting scholars from the National Institutes of Health
Reviewer for the National Institutes of Health (NIH) Fellowship Study Section F03A (Bethesda)
Reviewer for the National Institutes of Health (NIH) Special Emphasis Panel; ZRG1 MDCN-T(03)
Reviewer for the National Institutes of Health (NIH) Biophysics Panel (BPNS) (Wash., DC)
Reviewer for the National Institutes of Health (NIH) Special Emphasis Panel; ZRG1 MDCN-T(02)
Professional/technical training of a visiting scholar from the University of Queensland

2018

Journal reviewer (3 journals: Frontiers in Synaptic Neuroscience, Journal of Neurogenetics, eNeuro)
Mentor: Institutional Dev. Award (IDeA) Networks of Biomed. Research Excellence (INBRE)
Reviewer for the Deutsche Forschungsgemeinschaft (DFG) (German Research Foundation - GRF)

PhD dissertation reviewer for a University of Queensland (UQ) PhD candidate (Dendyun Ge)

2019

Journal reviewer (4 journals: Aging Cell, Nature Protocols, eLife, Microscopy & Microanalysis)
Reviewer for the Deutsche Forschungsgemeinschaft (DFG) (German Research Foundation - GRF)
Mentor: Institutional Dev. Award (IDeA) Networks of Biomed. Research Excellence (INBRE)
Reviewer for the National Institutes of Health (NIH) Fellowship Study Section F03A (Wash., DC)
Reviewer for the National Institutes of Health (NIH) Synapses (SYN) Study Section at (San Diego)

2020

Journal reviewer (3 journals: Nature, Current Biology, Neuroscience Letters)
Mentor: Institutional Dev. Award (IDeA) Networks of Biomed. Research Excellence (INBRE)
Reviewer for the National Science Foundation (NSF) (ad hoc - remote)

2021

Journal reviewer (2 journals: Neuroscience, Journal of Neuroscience)

2022

Journal reviewer (1 journal: PLoS Biology)
Reviewer for the National Science Foundation (NSF) (ad hoc - remote)
Reviewer for the National Institutes of Health (NIH) Fellowship Study Section F03A (remote)

2023

Journal reviewer (1 journal: Cell Reports)
Journal associate editor (1 journal; Frontiers in Cellular Neuroscience)
Reviewer for the National Institutes of Health (NIH) Fellowship Study Section F03A (Wash., DC)

Service to the Community/Public (since arriving at FAU in Oct 2013)

2015

Max Planck Florida Institute Institution Animal Care & Use Committee (IACUC) (regular member)
Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2016

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2017

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2018

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2019

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2020

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2021

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2022

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

2023

Coordinating the GrantSuccess program, providing ad-hoc feedback on grant funding proposals

Professional Development (since arriving at FAU - Oct 2013)

2014-15

Writing Across Curriculum (WAC) program training

2018

An interactive workshop on engaged and active learning in STEM

Course-based Undergraduate Research Experiences (CUREs) training
Active Learning Classroom Training

2019

Active Learning Workshop (the SCALE-UP pedagogy)

2020

Attended a workshop on “Flipping the Classroom” and did it to great effect with Cell Biology.