

# Arash (Ash) Tadjalli, Ph.D.

University of Florida

Department of Pharmacology and Therapeutics, College of Medicine  
Gainesville, Florida, U.S.A

**Citizenship: Canadian Citizen & American Permanent Resident**

## EDUCATION

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2006-2012

**University of Toronto, Ontario, Canada**

*Doctor of Philosophy (Ph.D.), Neuroscience — Neurophysiology Track*

Dissertation: Identification and characterization of neurotransmitter systems that influence plasticity and excitability of upper airway respiratory motor activity.

Mentor: Dr. James Duffin; Co-Mentor: Dr. John Peever

2005-2006

**University of Toronto, Ontario, Canada**

*\* Master of Science, Cell and Systems Biology— Neurobiology Track*

Dissertation: Characterization of hypoxia-induced respiratory motor plasticity during early postnatal development.

\* Note: I opted to do a mini-master's thesis and transferred to the PhD program in the same department (formerly known as The Department of Zoology).

Mentor: Dr. James Duffin

2000-2005

**University of Toronto, Ontario, Canada**

*Honours Bachelor of Science: Human Biology (Major), Biological Anthropology (Major) & Human Physiology (Minor)*

Honours Project: Identifications and characterization of orexinergic projections originating from the lateral hypothalamus of the rat.

## POSITIONS & EMPLOYMENT

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Apr.2021-present

**University of Florida, Gainesville, FL, USA**

*Research Scientist, Department of Pharmacology and Therapeutics, College of Medicine*

- Leads multiple cross-disciplinary research projects that aim to understand the cellular, molecular, and circuitry changes that underlie both the motor and non-motor symptoms of neurodegenerative disorders.
- Oversees lab operations, safety, orientation, and protocol training of new staff.
- Directly responsible for supervising multiple undergraduates and research professionals.
- Establishes inter-departmental collaborative efforts, overseeing preliminary data collection necessary for grant proposals/submissions.
- Participates in the review of operating procedures, technical transfers, development, and technical memos.
- Guest lecturer for university graduate-level biological science courses.
- Acts as a liaison between students/graduate trainees and departmental leadership

Apr. 2016-Mar. 2021

**University of Florida, Gainesville, FL, USA**

*Post-doctoral Research Fellow: Department of Physical Therapy, Department of Neuroscience & The McKnight Brain Institute*

- Managed independent, and cross-functional research collaborations, examining neuro-immune interactions and their effect on respiratory motor plastic mechanisms under steady state physiological conditions, and in pathological states characterized by inflammation of the central nervous system.
- Designed, executed, and communicated research to internal and external audiences through publications, poster presentations, seminars, and lectures.
- Lead protocol assessment preparation, reviews, and submissions to regulatory animal care and use committee for institutional compliance and approval.
- Lead and organized inter-college scientific educational discussion sessions for healthcare and research professionals on the topics of respiratory physiology, neuroplasticity, immunity, injury/trauma and neuro-rehabilitation.
- Trained and mentored multiple students as well as research professional fellows, delegating tasks to individual contributors on an ongoing basis.
- Lectured for multiple graduate-level university life-science courses.

May. 2014-Mar. 2016

**NeuroTek Innovative Technology Inc. Toronto, Ontario, Canada**

*Life Science Research Scientist & Adviser*

- Assisted external contract research collaborators in the biomedical research sector with scientific guidance and expertise for pre-clinical research in the areas of *in vivo* drug micro-dialysis, *in vivo* electrophysiology, sleep-wake state physiological monitoring, and new laboratory setup.
- Analyzed project challenges as presented by research contract partners, determining how to articulate solutions with quantitative and qualitative backup.
- Prepared scientific reports, presentations, written communications, and standard operating procedures for product safety profiles and partnering efforts.

Jan. 2013-Apr. 2014

**University of Iowa, Iowa City, USA**

*Visiting Research Scholar, Department of Psychology*

- Utilized *in vivo* electrophysiological extracellular multi-unit recording techniques as research tool for extracting complex cortical brain activity patterns during early rat postnatal development.
- Took the initiative to learn a new scientific technique for enhancing quantitative research methods for the assessment of cortical neural network activity.
- Refined and improved an existing laboratory protocol for recording simultaneous electromyograph and EEG activity in newborn rats.

Sep. 2006-Dec. 2012

**University of Toronto, Toronto, Ontario, Canada**

*PhD—Graduate Research Assistant, Department of Cell and Systems Biology*

- Designed and implemented *in vivo* experiments for the investigation of biochemical and neurotransmitter systems within brainstem networks that influence plasticity and motor control of upper airway muscle activity: experiments performed under both anesthesia, and behavior.
- Led multiple parallel research projects while meeting deadlines and quality standards, publishing multiple manuscripts in top-tier research journals.
- Recognized for outstanding oral platform presentation of scientific data and nationally recognized self-funded research grants
- Served as Head Teaching Assistant, training other Teaching Assistants for undergraduate teaching in life science courses.
- Served as teaching assistant for multiple life science courses, including cell signaling, animal physiology, systems neurobiology and endocrine physiology.
- Trained undergraduate and graduate student on an ongoing basis and participated in multiple team projects.

## RESEARCH GRANTS

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- **Parker B. Francis Foundation Fellowship Grant in Pulmonary and Respiratory Medicine**  
Award period: 07/2019-07/2021                      **Direct Cost: \$225,000**                      Role: Project PI  
Grant Title: Modulation of respiratory motor plasticity through neuro-immune interactions
  
- **Ontario Graduate Fellowship Young Investigator Grant in Natural Sciences**  
Award period: 09/2010-09/2012                      **Direct Cost: \$45,000**                      Role: Project PI  
Grant Title: Plasticity induction in brainstem neural motor networks via modulation of peripheral sensory feedback
  
- **Natural Sciences and Engineering Research Counsel of Canada Doctoral Grant**  
Award period: 09/2008-07/2010                      **Direct Cost: \$42,000**                      Role: Project PI  
Grant Title: Characterization of neurotransmitter systems that regulate plasticity and excitability of upper airway motor neurons in vivo

## HONORS & AWARDS

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2021	American Physiological Society <u>Outstanding Scientist Trainee of the Year- Respiratory Physiology Section</u> (\$1000.00, certificate issued)
2019	Parker B. Francis Foundation – Research Fellowship Grant (\$225,000.00)
2018	U. Florida Neuromuscular Plasticity Symposium – Outstanding Presentation of Research Data in Post-doc Category (\$450, certificate issued)
2018	U. Florida McKnight Brain Institute Research Recognition Award (\$1800)
2017	U. Florida Neuromuscular Plasticity Symposium – Outstanding Presentation of Research Data Post-doc Category (\$450, certificate issued)
2011	Canadian Institutes of Health Research – Institute of Circulatory and Respiratory Health Top publications Award for a Young Investigator (\$1000, certificate issued)
2010	Ontario Graduate Scholarship Doctoral Research Grant (\$45,000.00)
2010	Canadian Institutes of Health Research Young Investigator Forum– Outstanding grant proposal in the graduate student category (\$900)
2009	Senior Alumni Association Prize in Cell and Systems Biology (\$500)
2009	11 <sup>th</sup> Oxford Conference on Modelling and Control of Breathing, Nara, Japan – Presidential Award for Best Graduate Student Abstract (\$250)
2008	Natural Sciences and Engineering Research Counsel of Canada Doctoral Grant– Based on Outstanding Academic Achievement and Proposed Research Project (\$42,000.00)
2008	Canadian Sleep Society Meeting– Outstanding Graduate Student Abstract (\$400)
2007	University of Toronto 7 <sup>th</sup> Annual Research Day in Respirology– Outstanding Oral Platform Presentation of Research Data
2006	University of Toronto Department of Neuroscience–Best Graduate Student Poster Presentation Award
2005	University of Toronto Department of Neuroscience Best Graduate Student Poster Presentation Award

## CONFERENCE ORAL PRESENTATIONS (Presenting Speaker)

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- 2020 Morphine blocks spinal respiratory motor plasticity via mechanisms that require innate immune toll-like receptor 4 signaling. *Experimental Biology Conference*, San Diego, CA.
- 2018 Respiratory long-term facilitation requires cervical spinal cord activation of serotonin 2A and 2B receptors. *Society for Neuroscience*. San Diego, CA.
- 2017 The impairment of respiratory motor plasticity by systemic inflammation. *14th Oxford Conference on the Control of Breathing*. University of Oxford, England.
- 2013 The self-tuning sleeping brain: Activity-dependent scaling of network activity in the developing brain. *American Physiological Sleep Society Conference*. Indianapolis, Indianapolis.
- 2010 Identification of a novel form of noradrenergic-dependent respiratory motor plasticity triggered by modulation of vagal feedback. *The 11th Oxford Conference on Modelling and Control of Breathing*, Nara, Japan.
- 2009 Sleep loss prevents long-term facilitation of upper airway motor outflow triggered by repeated obstructive apneas. *Associated Professional Sleep Societies Annual Meeting*, Baltimore, MD.

## INVITED LECTURES & SEMINAR

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- 2020 Neuroinflammation and its influence on rehabilitation: from molecular mechanisms to therapeutic perspectives. Rehabilitation Science Doctoral Program. University of Florida. Gainesville, FL.
- 2019 Neuroanatomy of the respiratory system and the neural control of breathing. *Department of Medicine Neuroanatomy Graduate Program*. University of Florida. Gainesville, FL.
- 2019 The autonomic nervous system. *Doctor of Physical Therapy Undergraduate Program*. University of Florida. Gainesville, FL.
- 2018 The pathophysiology of neuroinflammation: Implications for breathing and plasticity. *Rehabilitation Science Doctoral Program*. University of Florida. Gainesville, FL.
- 2017 The impact of systemic inflammation on the expression of respiratory motor plasticity. *Neuromuscular Plasticity Noons Seminar Series*. University of Florida, Gainesville, Florida.
- 2012 State-dependent regulation of upper airway respiratory motor activity. *Cell and Systems Biology graduate Student Talk Series*. University of Toronto, Toronto, Ontario, Canada.
- 2011 Noradrenergic regulation of hypoglossal motor activity and plasticity: implications for sleep disordered breathing. *Cell and Systems Biology graduate Student Talk Series*. University of Toronto, Toronto, Ontario, Canada.

## CONFERENCE PRESENTATIONS & ABSTRACTS

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1. **Tadjalli A**, Levitt ES, Bolser DB and Mitchell GS (2020). Morphine blocks spinal respiratory motor plasticity by mechanisms that require innate immune toll-like receptor 4 signaling. *Experimental Biology Conference*. San Diego, California. Talk (cancelled due to COVID-19)
2. Thakkre P, Perim RR, **Tadjalli A** and Fuller DD (2020). Spinal delivery of ampakine CX717 impacts phrenic motor output in adult rats. *Experimental Biology Conference*. San Diego, California. Poster (cancelled due to COVID-19)
3. **Tadjalli A** and Mitchell GS (2019). BDNF-dependent phrenic motor facilitation: role of protein synthesis. *Experimental Biology Conference*. Orlando, Florida. Poster

4. **Elisa J. Gonzalez-Rothi\***, **Arash Tadjalli\***, Latoya L. Allen, Marissa C. Ciesla, Alec Simon, Zachary Asa, Kristin Smith, Mohamad El Chami, Ashley Holland, Juliet Santiago, Kelsey Stefan, Ashley Ross, Gordon S. Mitchell (2019). Daily acute, but not chronic, intermittent hypoxia enhances phrenic motor plasticity in chronic cervical spinal cord injury. Experimental Biology Conference, Orlando, Florida. [Poster](#)
5. **Tadjalli A** and Mitchell GS (2018). Moderate acute hypoxia-induced phrenic long-term facilitation requires cervical spinal cord activation of serotonin 2A and 2B receptors. *Society for Neuroscience Conference*. San Diego, California. [Talk](#)
6. **Tadjalli A** and Mitchell GS (2018). Phrenic long-term facilitation induced by moderate intermittent hypoxia requires activation of multiple Gq-coupled 5-HT<sub>2</sub> receptors. *University of Florida Annual Neuromuscular Plasticity Symposium*. Gainesville, Florida. [Poster](#)
7. Gonzalez-Rothi EJ, Allen LA, Santiago-Moreno J, Ciesla MC, Asa ZA, Smith KN, **Tadjalli A**, Perim R and Mitchell GS (2018) Long-term Delivery of “Low Dose” Repetitive Intermittent Hypoxia is Not Associated with Detectable Pathology. *FASEB J.* 32: 625.11. [Poster](#)
8. **Tadjalli A**, Perim R, Satriotomo I, Santiago-Moreno J, Seven YS and Mitchell GS (2017). LPS-induced systemic inflammation impairs phrenic long-term facilitation via okadaic acid-sensitive protein phosphatase activity. Experimental Biology Conference. [Poster](#)
9. **Tadjalli A** and Mitchell GS (2017). The impairment of respiratory motor plasticity by systemic inflammation. *14th Oxford Conference on Modelling and the Control of Breathing*. University of Oxford, England. [Talk](#)
10. **Tadjalli A**, Perim R, Satriotomo I and Mitchell GS (2017). Serine-threonine protein phosphatase 1/2A activity underlies the suppression of phrenic motor plasticity following systemic inflammation. *Annual University of Florida Neuromuscular Plasticity Symposium*. Gainesville, Florida. [Poster](#)
11. Gonzalez-Rothi EJ, **Tadjalli A**, Perim R, Simon A, Ciesla M and Mitchell GS (2017). Episode frequency determines the impact of chronic intermittent hypoxia on phrenic long-term facilitation. *FASEB J.* 31: 1055.1. [Poster](#)
12. **Tadjalli A** and Peever J (2011). Apnea-induced upper airway motor plasticity involves both noradrenergic as well as serotonergic-dependent processes. *FASEB J.* 25: 1111.11. [Poster](#)
13. **Tadjalli A**, Duffin J and Peever J (2010). Trk receptor activation on hypoglossal motoneurons is required for plasticity of upper airway motor outflow. *Society for Neuroscience Conference*. Chicago, IL. [Poster](#)
14. **Tadjalli A**, Duffin J and Peever J (2010). Identification of a novel form of noradrenergic-dependent respiratory motor plasticity triggered by modulation of vagal feedback. *The 11th Oxford Conference on Modelling and Control of Breathing*, Nara, Japan. [Talk](#)
15. **Tadjalli A**, and Peever J (2009). Sleep loss prevents long-term facilitation of upper airway motor outflow triggered by repeated obstructive apneas. *Associated Professional Sleep Societies Annual Meeting*. Seattle, Washington. [Talk](#)
16. **Tadjalli A**, Duffin J and Peever J (2008). Neural mechanisms of apnea-induced respiratory long-term facilitation of genioglossus motor outflow in-vivo. *Associated Professional Sleep Societies Annual Meeting*. Baltimore, Maryland. [Talk](#)
17. **Tadjalli A**, Duffin J and Peever J (2007). Long-term facilitation of upper airway motor outflow in spontaneously breathing rats in-vivo following repeated upper airway collapse. *Division of Respiriology 7th Annual Research Day*, Department of Medicine, University of Toronto. [Talk](#)
18. **Tadjalli A**, and Peever J (2006). Nucleoside-induced activation of neurotrophic signaling in upper airway motoneurons as a viable strategy for combating upper airway collapse during sleep. *Sleep Conference and Trainee Workshop*, Lake Arrowhead, California. [Talk](#)
19. **Tadjalli A**, Duffin J, Li YM, Hong H and Peever J (2005). Intermittent hypoxia induces long-term facilitation of respiratory motor output in juvenile rats. *Society for Neuroscience Conference*. Washington DC. [Poster](#)

## SCHOLARLY PUBLICATIONS

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1. **Tadjalli A**, Seven YB, Sharma A, McCurdy C, Bolser DB, Levitt ES and Mitchell GS (2021). Acute morphine blocks spinal respiratory motor plasticity via long-latency mechanisms that require toll-like receptor 4 signaling. *The Journal of Physiology*. 599(15):3771-3797
2. **Tadjalli A**, Seven YB, Perim RR and Mitchell GS (2021). Systemic inflammation suppresses spinal respiratory motor plasticity via mechanisms that require serine/threonine protein phosphatase activity. *The Journal of Neuroinflammation*. 18(1):28-39
3. **Tadjalli A\***, **Gonzalez-Rothi EJ\***, Allen LL, Ciesla MC, Seven YB, Asa ZA, Santiago JV, Holland A and Mitchell GS (2020). Intermittent hypoxia preconditioning and phrenic motor plasticity in rats with chronic cervical spinal cord injury. *Journal of Neurotrauma*. 38(9):1292-1305. \* indicates equal author contribution to the study (first co-author)
4. **Tadjalli A** and Mitchell GS (2019). Cervical spinal 5-HT<sub>2A</sub> and 5-HT<sub>2B</sub> receptors are both necessary for moderate acute intermittent hypoxia-induced phrenic long-term facilitation. *Journal of Applied Physiology*. 127(2):432-443.
5. Seven YB, Perim RR, Hobson OR, Simon AK, **Tadjalli A** and Mitchell GS (2018). Phrenic motor neuron adenosine 2A receptors elicit phrenic motor facilitation. *The Journal of Physiology*. 596: 1501-1512.
6. Lui S, Torontali Z, **Tadjalli A** and Peever J (2018). Brainstem Nuclei Associated with Mediating Apnea-Induced Respiratory Motor Plasticity. *Scientific Reports-Nature*. 8(1):12709-14.
7. **Tadjalli A**, Duffin J and Peever J (2011). Identification of a novel form of noradrenergic-dependent respiratory motor plasticity triggered by vagal feedback. *The Journal of Neuroscience*. 30(50):16886-95.
8. **Tadjalli A**, Duffin J. and Peever JH (2010). Repeated obstructive apneas induce long-term facilitation of genioglossus muscle tone. *New Frontiers in Respiratory Control*. 669: 297-301.
9. **Tadjalli A** and Peever J (2010). Role of neurotrophic signaling pathways in regulating respiratory motor plasticity. *Advances in Experimental Medicine and Biology*. 669: 293-296.
10. **Tadjalli A** and Peever J (2010). Sleep loss reduces respiratory motor plasticity. *Advances in Experimental Medicine and Biology*. 669: 289-292.
11. **Tadjalli A**, Duffin J and Peever J (2008). Intermittent hypoxia induces respiratory long-term facilitation in postnatal rats. *New Frontiers in Respiratory Control*. 605: 233-238.
12. **Tadjalli A**, Duffin J, Li YM, Hong H and Peever J (2007). Inspiratory activation is not required for episodic hypoxia-induced respiratory long-term facilitation in postnatal rats. *The Journal of Physiology* 585: 593-606

## TEACHING EXPERIENCE

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### University of Florida Teaching Experience: Biomedical Graduate Level Courses

2019-present

***Functional Neuroanatomy (GMS 6705)***

Course Instructor: Dr. Ron Mandel  
Role: Guest instructor

Develops and presents 60-minute lectures on the neuroanatomy of the respiratory system and neurophysiology of breathing, followed by creation of related test questions in a foundational graduate course for the Biomedical Sciences Program.

2018-present

***Doctoral Lecture Series in Neuro-Rehabilitation Science (RDS 6938)***

Course Instructor: Dr. David Fuller  
Role: Guest instructor

Develops and presents 60-minute lectures on the pathophysiology of neuro-inflammation and its impact on neuroplasticity in a foundational course for Rehabilitation Science Doctoral Program. Related teaching concepts to multiple clinical scenarios whenever possible.

2018-2019

***Neuroscience in Physical Therapy (PHT 6168C)***

Course Instructor: Dr. Elisa Gonzalez-Rothi  
Role: Guest instructor

Developed and gave in-class lectures entitled, "The Autonomic Nervous System", followed by creation of relevant test questions for Doctor of Physical Therapy Students.

Sept. 2016

***Center for Respiratory Rehabilitation and Research Best Laboratory Practice***

Course Instructor: Dr. David Fuller  
Role: Guest lecturer

Developed and gave two 60-minute presentations: "Laboratory Environmental Health and Safety" and "Care and Maintenance of Laboratory Tools and Equipment" for ~35 graduate students, post-docs, and faculty.

### University of Toronto Teaching Experience: Life Science Undergraduate Level Courses

2006-2012

***Animal and Human Physiology I & II Laboratory (BIO 270/271; 5 appointments)***

Course Instructor: Dr. Les Buck  
Role: Teaching Assistant

Demonstrated laboratory experiments and supervised laboratory practical sessions for undergraduate pre-med Life Science students. Expanded on existing laboratory protocols and initiated the creation of a brand-new laboratory practical section concerning mammalian hemoglobin oxygen dissociation curve.

2009-2011

***Comparative Cellular Physiology (CSB 335; 3 appointments)***

Course Instructor: Dr. Les Buck  
Role: Teaching Assistant

A seminar course that aimed to examine eukaryotic cell biology and physiology from a comparative approach. Held tutorial sessions for Biology Major students and graded tests and exams. Maintained attendance and grades.

2009-2011

**Respiration Neurobiology (CSB 346; 3 appointments)**

Course Instructor: Dr. John Peever

Role: Teaching Assistant

A seminar course that highlighted how the breathing rhythm is generated and regulated by both the central and peripheral afferent feedback. Created class assignments, wrote test questions, and presented multiple in class lectures.

2008-2011

**Endocrine Physiology (CSB 325; 3 appointments)**

Course Instructor: Dr. David Lovejoy

Role: Teaching Assistant

A seminar course for pre-med and Biology Major students that utilized an integrated genes-to-environment approach to examine aspects of hormonal evolution, physiological information flow, behavior, and neuroendocrinology. Created class assignments, test questions, and presented multiple in class lectures.

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## MENTORSHIP

### Undergraduate, Graduate and Postdoc Fellows Mentored

2021-present	Douglas Naubert: Undergraduate in Biology, University of Florida
2021-present	Jason Veizaj: Undergraduate in Biology, University of Florida
2021-present	Kevin Hutchinson: Pre-med Undergraduate, University of Florida
2018-2021	Zaffira Haque: Undergraduate in Biology, University of Florida
2018-2021	Mohamad El Chami: Postdoctoral Associate, University of Florida
2017-2021	Ela Sajjadi: PhD Graduate Student in Rehab Science, University of Florida -Current Clinical Research Scientist at Lyra Therapeutics, SD California
2017-2020	Marissa Ciesla: PhD graduate student in Rehab Science, University of Florida -Current Clinical Research Coordinator at Tallahassee Memorial HealthCare
2011-2012	Simon Lui: PhD Graduate Student, University of Toronto -Current Postdoctoral Associate at the University of Toronto
2009-2012	Zoltan Torontali: PhD Graduate Student, University of Toronto -Current Medical Science Liaison, Janssen Pharmaceutical
2007-2008	Asem Sammy Saleh: Masters Graduate Student, University of Toronto - Current Medical Resident, Neurovascular Surgery, U McMaster

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## PROFESSIONAL SERVICES

### Leadership Roles

2018-2020	<b>Journal Club Organizer and Leader</b> , University of Florida Breathing Research and Therapeutics Center – Launched and chaired weekly intercollege scientific educational discussion sessions for healthcare and research professionals covering topics in respiration neurobiology, immunity, neuroplasticity, injury/trauma and rehabilitation.
2010-2012	<b>Cell and Systems Biology Graduate Student Talk Series Organizer</b> : Organized, managed, and launched talk series for graduate students from various biological sciences departments at the University of Toronto. Provided an opportunity for students to develop their presentation and communication skills.
2010-2012	<b>Organizer and Instructor</b> : Toronto International Brain Bee – delivered neuroscience-related lectures, and, helped organize educational sessions for high school students preparing to participate in the International Brain Bee competition.

### Ad Hoc Manuscripts Reviewer

2018-Present	Frontiers in Aging Neuroscience (Review Editor)
2018-Present	Behavioral and Brain Functions
2019	Journal of Neurophysiology
2018	Journal of Applied Physiology
2017	Frontiers in Neuroscience

## MEMBERSHIPS

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2012-present Society for Neuroscience  
2017-present American Physiological Society  
2008-2013 Sleep Research Society

## COMMUNITY SERVICE

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2021-Present **Graduate Research Symposium Poster Judge:** UF Chapter of the Society for Advancement of Chicanos/Hispanics & Native Americans in Science. Proud to serve as a judge, evaluating the research work of graduate students at the University of Florida. This meeting is designed to highlight the work of underprivileged students from under-represented communities and minority groups.

2017-2019 **Diversity-Day Poster Competition Judge:** The North Central Florida Chapter of the Society for Neuroscience (NCF SfN). The mission of the NCF SfN is to advance the understanding of the brain and the nervous system by bringing together scientists of diverse backgrounds, by facilitating the integration of research directed at all levels of biological organization, and by encouraging translational research and the application of new scientific knowledge to develop improved disease treatments and cures. I was honored to serve as a judge for the poster session competition, contribution to a great cause designed to promote general education about the nature of scientific discovery.

2011-2012 **Head Coach:** University of Toronto- Men's Soccer: School of Graduate Studies. Served as the head-coach and player for the School of Grad Studies men's soccer team. Competed in university-wide intramural competitions, as well as metro Toronto regional championship.

2010-2012 **Organizer and Educator:** International Brain Bee, City of Toronto. The International Brain Bee is a mentoring program that provides a reliable and continued source of personal and academic mentorship to high school students throughout their high school career by medical and biomedical Ph.D. research professionals. Through this program I fostered interest in science and provided students with the guidance needed to pursue a career in a scientific field such as medicine, biotechnology or research. As a mentor and organizer, I met with high school students on a bi-weekly basis during the academic year providing professional development, tutoring, test prep for the International Brain Bee competition.

## PROFESSIONAL REFERENCES

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### **James Duffin, PhD, MASC, P.Eng**

Professor, Department of Physiology and Anesthesia, University of Toronto &  
Thornhill Research, University Health Network, Toronto, ON, Canada

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### **Paul Reier, PhD**

Anne and Oscar Lackner Professor & Eminent Scholar

Department of Neuroscience

University of Florida

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### **Erica Levitt, PhD**

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**Yasin Seven, PhD**

Research Faculty, Breathing Research and Therapeutics Center, The Department of Physical Therapy & The McKnight Brain Institute  
University of Florida

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**Gary Sieck, PhD**

Mayo Clinic Distinguished Professor, Cell and Regenerative Physiology  
Editor-in-chief, Physiology, 2012-present  
Former President of the American Physiological Society  
Rochester, Minnesota

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**TEACHING REFERENCES**

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University of Florida

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**David Fuller, PhD**

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University of Florida

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Phone: 352-273-6634

**Leslie Buck, PhD**

Professor, Department of Cell and Systems Biology

University of Toronto

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## **EXAMPLE TECHNICAL LABORATORY SKILLS & EXPERIENCE**

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### **Pharmacological, Molecular and Cellular**

- PCR, real-time quantitative PCR, Gel electrophoresis, ELISA
- Constructing plasmids and primers
- Intracardial perfusion, tissue sample processing and histology (brain and peripheral organs)
- Immunofluorescence, florescent and confocal microscopy
- In vivo gene knockdown using small interfering RNA technology
- Multiplex magnetic bead-based assays for protein quantification

### **In vivo & in vitro Physiology, Pharmacology and Behavioral Analysis**

#### **In vivo**

- Rodent spinal cord injury (hemi-sections/ contusions)
- Rodent survival surgery
- Colony management, rodent handling and post-operative care and well-being assessment
- Intrapleural injections, stereotaxic surgery, stereotaxic drug/tracer/compound injections
- In vivo drug delivery via reverse-microdialysis under behavior
- Electroencephalogram and muscle electromyogram electrode implantation
- Subcutaneous pump implementation for continuous drug delivery
- Electroencephalogram and muscle electromyogram recording under anesthesia and behavior
- Nerve isolation and activity measurement
- Neurostimulation, and multichannel recording of neural activity
- Sleep-wake monitoring, recording and quantification (EEG)
- In vivo real-time measurement of neurotransmitter release using enzyme-based probes
- Indwelling artery and vein cannulation/implantation for chronic rodent blood sample collection
- Whole-body plethysmograph and assessment of breathing frequency and tidal volume
- Drug Delivery: i.t., i.v., s.c., i.p., p.o.

#### **In vitro**

- Acute brain slice preparation (hippocampal, cerebellum, striatum, cortex)
- Whole cell patch-clamp electrophysiological recording
- Cell-attached electrophysiology
- Optogenetic pathway activation in brain slices