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Updated June, 2024

Current position

Postdoctoral Researcher — New York City, USA
Columbia University
Project title: The neurobiology of abstraction in virtually navigating primates
Advisors: Dr. C Daniel Salzman, Dr. Stefano Fusi
Funding: NINDS K99/R00 Transition to Independence Award K99NS133475

Education

Doctor of Philosophy — Montréal, Canada
McGill University
Thesis title: Hippocampal function in non-human primates
Advisor: Dr. Julio C. Martinez-Trujillo
Funding: CIHR Brain Star Award; Graduate Excellence Award; Graduate Mobility Award; GREAT Travel Award; David G. Guthrie Fellowship; NSERC Doctoral Post-Graduate Scholarship; Ontario Graduate Scholarship

Master of Science — Guelph, Canada
University of Guelph
Thesis title: Exercise-induced recovery of skeletal muscle insulin response is independent of adiponectin response in high-fat fed rodents.
Advisor: Dr. David J. Dyck
Funding: Sun Life Financial HH&NS Research Scholarship; Ontario Graduate Scholarships in Science & Technology

Bachelor of Science, Honours — Guelph, Canada
University of Guelph
Human Kinetics

Under review

1) Abbass M, Corrigan BW, Johnston R, Gulli RA, Sachs A, Lau JC, Martinez-Trujillo JC. Neural Ensembles in the Lateral Prefrontal Cortex Temporally Multiplex Task Features During Virtual Navigation. ***bioRxiv***. 2024:2024-01. DOI: 10.1101/2024.01.10.574378

2) Xiang JD, Roussy M, Corrigan B, Gulli RA, Luna R, Mofrad MH, Muller L, Diedrichsen J, Schmitz TW, Martinez-Trujillo J, Mur M. Task-specific topographical maps of neural activity in the primate lateral prefrontal cortex. ***bioRxiv***. 2024:2024-05. DOI: 10.1101/2024.05.10.591729

Published works

1) Gulli RA, Martinez-Trujillo JC. Studies of Hippocampal Function in Non-Human Primates. ***Encyclopedia of the Human Brain, 2nd Edition*** (September 2024). DOI: 10.1016/B978-0-12-820480-1.00069-3

2) Busch A, Roussy M, Luna R, Leavitt ML, Mofrad MH, Gulli RA, Corrigan B, Mináč J, Sachs AJ, Palaniyappan L, Muller L. Neuronal activation sequences in lateral prefrontal cortex encode visuospatial working memory during virtual navigation. **Nature Communications**. 2024 May 25;15(1):4471. DOI: 10.1038/s41467-024-48664-9

3) Piza DB, Corrigan BW, Gulli RA, Do Carmo S, Cuello AC, Muller L, Martinez-Trujillo J. Primacy of vision shapes behavioral strategies and neural substrates of spatial navigation in marmoset hippocampus. ***Nature Communications***. 2024 May 14;15(1):4053. DOI:10.1038/s41467-024-48374-2

4) Corrigan BW, Gulli RA, Doucet G, Mahmoudian B, Abbass M, Roussy M, Luna R, Sachs AJ, Martinez-Trujillo JC. View cells in the hippocampus and prefrontal cortex of macaques during virtual navigation. ***Hippocampus***. 2023 Mar;33(5). DOI: 10.1002/hipo.23534

5) Johnston R, Abbass M, Corrigan B, Gulli RA, Martinez-Trujillo J, Sachs A. Decoding spatial locations from primate lateral prefrontal cortex neural activity during virtual navigation. ***Journal of Neural Engineering***. 2023 Feb 24;20(1):016054. DOI: 10.1088/1741-2552/acb5c2

6) Roussy M, Corrigan B, Luna R, Gulli RA, Sachs AJ, Palaniyappan L, Martinez-Trujillo JC. Stable working memory and perceptual representations in macaque lateral prefrontal cortex during naturalistic vision. ***Journal of Neuroscience***. 2022 Nov 2;42(44):8328-42. DOI: 10.1523/JNEUROSCI.0597-22.2022

7) Corrigan BW, Gulli RA, Doucet G, Roussy M, Luna R, Pradeepan KS, Sachs AJ, Martinez-Trujillo JC. Distinct neural codes in primate hippocampus and lateral prefrontal cortex during associative learning in virtual environments. ***Neuron***. 2022 May 5. DOI: 10.1016/j.neuron.2022.04.016.

8) The PRIMatE Data and Resource Exchange (PRIME-DRE) Global Collaboration Workshop and Consortium. Toward next-generation primate neuroscience: A collaboration-based strategic plan for integrative neuroimaging. ***Neuron***. 2022 Jan 5;110(1):16-20. DOI: 10.1016/j.neuron.2021.10.015

9) Roussy M, Luna R, Duong L, Corrigan B, Gulli RA, Nogueira R, Moreno-Bote R, Sachs AJ,

Palaniyappan L, Martinez-Trujillo JC. Ketamine disrupts naturalistic coding of working memory in primate lateral prefrontal cortex networks. ***Molecular Psychiatry***. 2021 Nov;26(11):6688-6703. DOI: 10.1038/s41380-021-01082-5

10) Tremblay S, …, Gulli RA, …, Shenoy KV, DiCarlo JJ, Platt ML. An open resource for non-human primate optogenetics. ***Neuron***. 2020 Dec 23;108(6):1075-90. DOI: 0.1016/j.neuron.2020.09.027

11) Hopper LM, Gulli RA, Howard LH, Kano F, Krupenye C, Ryan AM, Paukner A. The application of noninvasive, restraint-free eye-tracking methods for use with nonhuman primates. ***Behavior Research Methods***. 2020 Sep 15:1-28. DOI: 10.3758/s13428-020-01465-6

12) Gulli RA, Duong LR, Corrigan BW, Doucet G, Williams S, Fusi S, Martinez-Trujillo JC. Context-dependent representations of objects and space in the primate hippocampus during virtual navigation. ***Nature Neuroscience*** 2020. 23(1):103-12. DOI: 10.1038/s41593-019-0548-3

13) Doucet G, Gulli RA, Corrigan BW, Duong LR & Martinez-Trujillo JC (2019, in print). Modulation of local field potentials and neuronal activity in primate hippocampus during saccades. ***Hippocampus*** 2020. 30(3):192-209. DOI: 10.1002/hipo.23140

14) Gulli RA. Beyond metaphors and semantics: A framework for causal inference in neuroscience. ***Behavioral and Brain Sciences*** 2019. 42. DOI: 10.1017/S0140525X19001389

15) Martinez-Trujillo JC & Gulli, RA. Dissecting Modulatory Effects of Visual Attention in Primate Lateral Prefrontal Cortex Using Signal Detection Theory. ***Neuron*** 2018. 97, 1208–1210. DOI: 10.1016/j.neuron.2018.03.012

16) Blonde J, Roussy M, Luna R, Mahmoudian B, Gulli RA, Barker KC, Lau JC & Martinez-Trujillo JC. Customizable cap implants for neurophysiological experimentation. ***Journal of Neuroscience Methods*** 2018. 304, 103–117. DOI: 10.1016/j.jneumeth.2018.04.016

17) Corrigan BW, Gulli RA, Doucet G, Martinez-Trujillo JC. Characterizing eye movement behaviors and kinematics of non-human primates during virtual navigation tasks. ***Journal of Vision*** 2017. 17(12), 15. DOI: 10.1167/17.12.15

18) Martinez-Trujillo JC, Gulli RA, Doucet G, Corrigan BW. Dissociable effects of saccades on hippocampal local field potential power and phase. ***Journal of Vision*** 2017. 17(10), 1151.

19) Corrigan BW, Gulli RA, Doucet G, Martinez-Trujillo JC. Target presence affects the eye movement behaviour and kinematics of non-human primates in virtual navigation tasks. ***Journal of Vision*** 2017. 17(10), 541.

20) Doucet G, Gulli RA, Martinez-Trujillo JC. Cross-species 3D virtual reality toolbox for visual and cognitive experiments. ***Journal of Neuroscience Methods*** 2016. (266), 84-93. DOI: 10.1016/j.jneumeth.2016.03.009

21) Doucet G, Tremblay S, Gulli RA, Pieper F, Sachs A, Martinez-Trujillo JC. Single trial decoding of visual attention from local field potentials in the primate lateral prefrontal cortex. ***Journal of Vision*** 2015. 15(12), 228.

22) Gulli RA, Tremblay S, Adamantidis AR, Martinez-Trujillo JC. Optogenetic stimulation of the

frontal eye field in an awake, behaving monkey. *Journal of Vision* 2013. 13(9), 228.

23) Gulli RA, Tishinsky JM, MacDonald T, Robinson LE, Wright DC, & Dyck DJ. Exercise restores insulin, but not adiponectin, response in skeletal muscle of high-fat fed rodents. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 2012. 303(10), R1062-R1070. DOI: 10.1152/ajpregu.00176.2012

24) Tishinsky JM, Gulli RA, Mullen KL, Dyck DJ, & Robinson LE. Fish oil prevents high saturated fat diet-induced impairments in adiponectin and insulin response in rodent soleus muscle. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 2012. 302, R598-R605. DOI: 10.1152/ajpregu.00328.2011

25) Stefanyk LE, Gulli RA, Ritchie IRW, Chabowski A, Snook LA, Bonen A, & Dyck DJ. Recovered insulin response by 2 weeks of leptin administration in high-fat fed rats is associated with restored AS160 activation and decreased reactive lipids. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 2011. 301, R159–R171. DOI: 10.1152/ajpregu.00636.2010

26) Ritchie IRW, Gulli RA, Stefanyk LE, Harasim E, Chabowski A, & Dyck DJ. Restoration of skeletal muscle leptin response does not precede the exercise-induced recovery of insulin-stimulated glucose uptake in high-fat-fed rats. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 2011. 300, R492–R500. DOI: 10.1152/ajpregu.00602.2010

27) Thrush AB, Harasim E, Chabowski A, Gulli RA, Stefanyk LE, & Dyck DJ. A Single Prior Bout of Exercise Protects Against Palmitate-Induced Insulin Resistance Despite an Increase in Total Ceramide Content. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 2011. 300, R1200–R1208. DOI: 10.1152/ajpregu.00091.2010

28) Cresser J, Bonen A, Chabowski A, Stefanyk LE, Gulli R, Ritchie I, & Dyck DJ. Oral administration of a PPAR-delta agonist to rodents worsens, not improves, maximal insulin-stimulated glucose transport in skeletal muscle of different fibers. *American Journal of Physiology – Regulatory, Integrative and Comparative Physiology* 2010. 299, R470–R479. DOI: 10.1152/ajpregu.00431.2009

Honors and Awards

K99/R00 Pathway to Independence Award (NINDS)	June 2023
Elected Gordon Research Seminar Chair	July 2022
CIHR Brain Star Award	January 2021
Graduate Excellence Award	August 2017
Graduate Mobility Award	July 2017
CCN Summer School tuition, board, & lodging	April 2017
GREAT Travel Award	October 2014
David G. Guthrie Fellowship	September 2014
NSERC Doctoral Post-Graduate Scholarship	May 2011
Ontario Graduate Scholarship	Declined; May 2011
Sun Life Financial HH&NS Research Scholarship	August 2010
Ontario Graduate Scholarships in Science & Technology	January 2010
NSERC Undergraduate Student Research Assistantship	May 2009
Undergraduate Research Award	May 2008
University of Guelph Entrance Scholarship	September 2005

Invited Presentations

Special Seminar — New York City, USA
Mount Sinai School of Medicine — June 2024
The episodic memory network in health and disease

Meet-The-Experts Session — Washington D.C., USA
Mount Sinai School of Medicine — November 2023
A new system for reliable and accurate Neuropixels recordings in the non-human primate

Special Seminar — New York City, USA
Mount Sinai School of Medicine — June 2023
The neurobiology of flexible behaviour in virtually navigating monkeys

Nanosymposium talk — San Diego, USA
Society for Neuroscience Annual Meeting — Nov 2022
The neurobiology of flexible behaviour in virtually navigating monkeys

Special Seminar — New York City, USA (virtual)
Columbia University — July 2021
On hippocampal contributions to deliberative choice

Special Seminar — Bethesda, USA (virtual)
National Institutes of Mental Health — February 2020
Context-dependent representations of objects and space in the primate hippocampus during virtual navigation

Magnetic Resonance Imaging Core Meeting — New York City, USA
Columbia University — February 2020
High fidelity reconstruction of skull morphology using an Ultrafast TE sequence

Columbia University Hippocampus Club — New York City, USA
Columbia University — June 2019
Objects, context, memory & space: Neuronal representations in the hippocampus of virtually navigating primates

Nanosymposium talk — San Diego, USA
Society for Neuroscience Annual Meeting — Nov 2018
Single-neuron and population encoding of objects and space in the hippocampus and PFC during virtual navigation

Special Seminar — La Jolla, USA
Salk Institute — Jan 2018
Understanding hippocampal function in non-human primates

Special Seminar — New York City, USA
Columbia University — Dec 2017
Understanding hippocampal function in non-human primates

Robarts Research Institute Data Club — London, Canada
University of Western Ontario — Jan 2017
Signatures of the cognitive map in the hippocampus in virtually navigating monkeys

Center for Visual Science Symposium: The Future of Attention — Rochester, USA
University of Rochester — May 2016
Exploring the cognitive map: Hippocampal activity in virtually-navigating non-human primates

Canadian Association for Neuroscience Satellite Symposium — Toronto, Canada
Place coding in the primate hippocampus is task-dependent during virtual navigation — May 2016

Brain and Mind Institute Annual Symposium — London, Canada
University of Western Ontario — June 2015
Contextual learning in the monkey hippocampus during virtual navigation: From behaviour to single units

Western University Systems Neuroscience Symposium — London, Canada
University of Western Ontario — November 2014
Hippocampal codes for associative memory and navigation through virtual environments in rhesus monkeys

Montreal Optogenetics Club — Montréal, Canada
McGill University — November 2013
Excitatory optogenetics in non-human primates

GSAN Student Experimental Research Forum — Montréal, Canada
McGill University — October 2013
Optogenetics

Montreal Optogenetics Club — Montréal, Canada
McGill University — July 2012
Optogenetics in the non-human primate: Methods and advancements in targeting cortical and non-cortical structures

Graduate Student Symposium — Guelph, Canada
University of Guelph — May 2010
Restoration of adiponectin response is not necessary for the exercise-induced recovery of insulin response: preliminary results

Academic Appointments

Visiting Graduate Student — London, Canada
University of Western Ontario — May 2015-Oct 2018

Research Assistant — Guelph, Canada
University of Guelph — Sept 2010-Apr 2011
Research Focus: Conducted a research project to determine whether adipose tissue hypoxia is a determinant to altered adipokine secretion in obesity. Responsibilities include experimental design and organization, methodologies including primary cell culture, ELISA procedures and Western blotting.
Supervisor: Dr. David Wright

Research Assistant — Guelph, Canada
University of Guelph — May 2010-Sept 2011
Research Focus: Conducted radio-immuno assays of blood insulin for inclusion in research conducted by the Human Nutraceutical Research Unit, University of Guelph.
Supervisor: Dr. Allison Duncan

Research Assistant — Guelph, Canada
University of Guelph — May 2009-Sept 2009
Research Focus: Conducted research funded by an Undergraduate Student Research Award through NSERC (a federal funding agency). Became practiced in surgical procedures including implantation of mini-osmotic pumps into the rats as well as mitochondrial isolation and purification techniques. Work contributed to the manuscript of Stefanik et al. (2011).
Supervisor: Dr. David J. Dyck

Research Assistant — Guelph, Canada
University of Guelph — Sept 2008-May 2009
Research Focus: Assisted in animal care procedures, exposure of rats to experimental treatments, tissue harvest, tissue analysis, and data interpretation. Work contributed to the manuscript of Ritchie et al. (2011)
Supervisor: Dr. David J. Dyck

Research Assistant — Guelph, Canada

University of Guelph May 2008-Sept 2009

Research Focus: Designed and completed a study examining the effects of intermittent hyperoxic gas exposure on blood erythropoietin and red blood cell concentration in elite runners. Study design, and organization, running experimental trials, sample collection and analysis, and data analysis. Conducted trials examining sweat rates and fluid and sodium balance. Provided subjects with feedback to optimize performance in competition. Among athletes tested were 40 players of the 2008 selection camp for the Canadian World Junior hockey team.

Supervisor: Dr. Lawrence Spriet

Educational Contributions

Justice Through Code
Columbia University
New York City, USA
Fall 2022
42 students
Contact time: 44 hours

Justice Through Code
Columbia University
New York City, USA
Spring 2021
42 students
Contact time: 44 hours

Justice Through Code
Columbia University
New York City, USA
Fall 2020
25 students
Contact time: 44 hours

PHIL3993, The Ethics of Science
University of Western Ontario
London, Canada
October 2016
40 students
Contact time: 4 hours
Guest lecture: Applied Ethics of Biomedical Research

PHYS*4680,Cellular/Molecular Neurobiology
University of Western Ontario
London, Canada
October 2016
50 students
Contact time: 3 hours
Guest lecture: Conducting animal research in non-human primates

PGHY*213, Introductory Physiology
McGill University
Montréal, Canada
Winter 2014
255 students
Contact time: 100 hours
Responsibilities: Exercise Physiology lab section: set up equipment, led lab talks, instructed students through collection, analysis and discussion of data; marked completed lab reports; led review a review session prior to examination

HK*4600, Applied Human Biology II — Guelph, Canada
University of Guelph — Winter 2010
118 students
Contact time: 40 hours
Responsibilities: Set up equipment, led lab talks, and instructed students while working with equipment and collecting data; marking lab reports and midterms. Labs included: pulmonary function testing; 12-lead electrocardiograms; non-invasive manual calculation of cardiac output, and; automated calculation of cardiac output

NUTR*4210, Nutrition, Exercise and Energy Metabolism — Guelph, Canada
University of Guelph — Fall 2010
278 students
Contact time: 70 hours
Responsibilities: Attended all lectures, marked all midterms and final exams, met with students to review material, moderated online discussions

KIN*2070, Biochemistry II — Toronto, Canada
University of Guelph-Humber — Fall 2010
38 students
Contact time: 70 hours
Evaluation Score: 4.97/5.00
Responsibilities: Designed and led independent seminars; designed marking schemes for oral and written presentations; marked oral presentations and written assignments

KIN*2070, Biochemistry II — Toronto, Canada
University of Guelph-Humber — Fall 2009
35 students
Contact time: 70 hours
Evaluation Score: 4.88/5.00
Responsibilities: Independently structured and led lab periods; extensive use of lab equipment including metabolic carts, cycle ergometers, sphygmomanometers and respirometers; designed of marking schemes for written laboratory reports; and marked lab reports

Educational Administration & Leadership

Gordon Research Seminar: The Neurobiology of Cognition — Waterville Valley, NH
Conference Chair — July 2024
I was elected to chair this Gordon Research Seminar by my peers. The Neurobiology of Cognition GRS provides a unique forum for young doctoral and post-doctoral researchers to present their work, discuss new methods, cutting edge ideas, and pre-published data, as well as to build collaborative relationships with their peers. Experienced mentors and trainee moderators will facilitate active participation in scientific discussion to allow all attendees to be engaged participants rather than spectators.

Columbia Hippocampus Club — New York City, USA
Columbia University — July 2022-present
Organizes a monthly seminar series focused on understanding hippocampal evolution and function across through

studies of disease, anatomy, activity, and computation. The aim of this series is to foster discussion and collaborations between the wide array of researchers at Columbia University studying the hippocampus, learning, and memory.

Zuckerman Institute Postdoctoral Seminar Series — New York City, USA
Columbia University — May 2020-present
Co-organizes a regular seminar featuring postdoctoral researchers from across the Columbia campus. The aim of this symposium was to give postdoctoral researchers a chance to present their work with a special emphasis on engaging feedback from senior faculty and administrators.

Western University Systems Neuroscience Symposium — London, Canada
University of Western Ontario — Nov 2014
Co-organized a symposium spanning molecular, systems, and behavioural neuroscience at Western University for researchers from Western University, McGill University, and industry partners. The aim of this symposium was to foster collaborations and initiatives amongst researchers between campuses and across systems neuroscience.

McGill Brain Oscillations Club — Montréal, Canada
McGill University — May 2013-Apr 2014
Co-organized a bi-weekly discussion of new, unpublished data from McGill University neuroscientists studying the functional role of low-frequency fluctuations recorded from the brains of humans and other mammals.

McGill University Research Advisory Council — Montréal, Canada
McGill University — Sept 2011-Sept 2013
Represented the McGill graduate students and the Post-Graduate Student Society at meetings of the Research Advisory Council, chaired by the McGill Vice-Principal of Research & Innovation.

Board of Directors — Guelph, Canada
University of Guelph, Graduate Student Association — Sept 2009-May 2011
Represented the Department of Human Health and Nutritional Sciences.

Constitution and By-laws Committee — Guelph, Canada
University of Guelph, Graduate Student Association — Sept 2009-May 2011
Critically examined any changes to the GSA governing policy and to ensure the integrity of the GSA Constitution and By-laws.

Canadian Federation of Students' Advisory Committee — Guelph, Canada
University of Guelph, Graduate Student Association — Sept 2009-May 2011
An ad-hoc committee formed to critically evaluate the membership of the GSA within the federal and provincial branches of the Canadian Federation of Students.