1. Rosa Maria da Silva

2. Business Address

McMaster University, LSB 540
1280 Main Street West; Hamilton, Ontario L8S 4K1
Telephone:1-905-525-9140 ext 26314
Email: rosa.dasilva@mcmaster.ca
Websites: www.rosadasilvaphd.com, www.thestinkbugproject.com

3. Educational Background

2011-2012 **Postdoctoral Fellow-Cell and Molecular Biology**
Department of Biological Sciences
University of Toronto Scarborough (UTSC), Canada
Project: *Role of cytoskeletal scaffolding proteins on cancer cell motility in an osteosarcoma model*
Supervisor: Dr. R.E. Harrison

2010-2011 **Postdoctoral Fellow**
1) *Role of neuropeptides in a Chagas disease vector*
2) The effect of nitric oxide on insect cardiac systems
Department of Biology
University of Toronto Mississauga (UTM), Canada
Supervisors: Drs. A.B. Lange and I. Orchard

2004-2010 **PhD, Department of Cell and Systems Biology**
University of Toronto, Canada
Thesis Title: *The control of the locust spermatheca*
Supervisor: Dr. A.B. Lange

1999-2004 **Honours Bachelor of Science *with Distinction***
Department of Biology
University of Toronto Mississauga (UTM), Canada
Thesis Title: *The association of a cardioactive peptide with insect reproductive systems*
Supervisor: Dr. A.B. Lange

4. Current Status at McMaster

2019-present Assistant Professor, *Teaching-Stream*
2018-present McMaster Distinguished Teaching and Learning Fellow and Mentor
2015-present Leadership in Teaching and Learning Fellow
2013-2019 Assistant Professor, CLA-*Teaching Stream*
Department of Biology & Life Sciences Program (School of Interdisciplinary Science)

5. Professional Organizations

2014-present Society for Teaching and Learning in Higher Education (STLHE)
2014-present Entomological Society of America
2012-present Open Consortium of Undergraduate Biology Educators (oCUBE)
2011-present American Society for Cell Biology
2007-present Canadian Society of Zoologists

6. Employment History

a. Academic

2019-present Assistant Professor, *Teaching- Stream*
2013-2019 Assistant Professor, CLA; McMaster University
2013 Sessional Lecturer; Biomed Sciences/Ontario Veterinary College; University of Guelph
2013 Sessional Lecturer; Department of Cell and Systems Biology; University of Toronto
2012 Sessional Lecturer; Department of Biological Sciences; UofT Scarborough
2010-2013 Sessional Lecturer; Department of Biology; UofT Mississauga
2003-2010, 2012 Teaching Assistant; Department of Biology; University of Toronto Mississauga

b. Consultations: *Not applicable*
c. Other: *Not applicable*

7. Scholarly and Professional Activities

a. **Editorial boards: 2012 and 2014** Textbook reviewer: Moyes and Schulte Principles of Animal Physiology, 3rd Edition- Published January 2015
b. Grant & personnel committees: *Not applicable*
c. Executive positions: *Not applicable*
d. **Journal referee: 2009, 2015, 2016, 2018, 2019** Reviewer of manuscripts in (1) Journal of Insect Physiology, (2) Insect Science, (3) Comparative Biochemistry and Physiology
e. External grant reviews: *Not applicable*

8. Areas of Interest

Research

My pedagogical research interests are focused on a main theme of facilitating scientific literacy and translational skill development of undergraduate students. I have approached this goal through pedagogical research evaluating methods that can be used to enhance student learning outcomes and engagement within the science classroom in addition to discipline-related mentoring of undergraduate students in the laboratory. Both research directions involve the direct supervision of students in team-based projects that are directed towards publishable manuscripts that are co-authored amongst all student participants. A more broad research interest of mine has been the analysis of Blended Learning course outcomes on student learning and the measurement of student reflections and course-related outcomes as self-reported in the McMaster Learning Portfolio database. It is through this type of an analysis that it will be possible to identify the academic and professional development of our students and their ultimate career action plans. My research projects are outlined below:

Pedagogical Research:

Evaluating the Impact of Long-Term STEM Engagement Projects on Science Education

Funding: Postdoctoral Research support provided by the McMaster McCall/MacBain Postdoctoral Fellowship Program (2020-onward); and the NSERC PromoScience Program (2020)

- This research is being conducted in collaboration with Drs. Elizabeth Weretilnyk and Robin Cameron (Professors-Department of Biology) together with (as of January 2020) McCall/MacBain Postdoctoral Fellows- Dr. Solmaz Irani

Horizontal Curriculum Integration within a Biology Program

Funding: McMaster MacPherson Institute Leadership in Teaching and Learning Fellowship program (2018-present) with Postdoctoral Research support provided by the McMaster McCall/MacBain Postdoctoral Fellowship Program (2020-onward)

- This research is being conducted in collaboration with Dr. Robin Cameron, Professor-Department of Biology, Abeer Siddiqui, Learning Support Librarian at McMaster University and Alastair Tracey, Undergraduate Coordinator-Department of Biology, together with (as of January 2020) McCall/MacBain Postdoctoral Fellows- Drs. Oana Birceanu and Dennis Kolosov.

Assessing the Outcomes of Blended Learning in a Level I Biology Course
Funding: McMaster MacPherson Institute Leadership in Teaching and Learning Fellowship Program (2015-present)

- This is a McMaster Research Ethics Board approved research project, and we are currently in preparation of a manuscript that will report the results of our findings with research students Irtaza Tahir (Hons. Life Sciences), Victoria Radauskas (Arts and Sciences), Victoria Van Mierlo (Hons. Biology), Wayne Yeung (Hons. Biology & Pharmacology) and Alastair Tracey (Undergraduate Course Coordinator and Co-Investigator).

Social Media and Technological Teaching Tools in the Science Classroom
(2014- 2016)

- In collaboration with Giuliana Guarna (former BIO4F06 student), we have completed a research project (implemented in the LifeSci3A03 course) that evaluated the effectiveness of the use of social media in the classroom environment in a manner that was not reflected in student grades.
- This is a McMaster Research Ethics Board approved research project, and we plan to submit the results from this study for publication.
- Follow up research included collaborating with Lauren Tabone (former BIO4C09 student) to explore the use of exploring of the use of social media and technological teaching tools in the high school science classroom as a means of developing scientific literacy in pre-university students. Results of this study will also be submitted for publication.

Establishing a Meta-analysis based Learning Portfolio database
Funding: McMaster University Forward with Integrity Grant (2014-2016)

- This is a McMaster Research Ethics Board approved research project that was conducted in collaboration with Dr. Andrew McArthur, Associate Professor and Cisco Chair in Bioinformatics in the Faculty of Health Sciences at McMaster.
- Through this project, Dr. McArthur and I have developed a novel framework for a learning portfolio model that will more effectively provide students with formative feedback in courses and along the completion of their undergraduate programs.

Discipline-Related Project-Based Undergraduate Research and Mentoring:
Working to understand the biology of pest organisms-The McMaster Stink Bug Project *(2014-present)*
Funding: McMaster Science Society- Academic Science Fund

- We are currently in preparation of our first manuscript with research students Irtaza Tahir (former Hons. Life Sciences student) , Ryan Peters and Victoria Radauskas (former Arts and Sciences/Biology Students) in collaboration with Dr. Angela B. Lange (University of Toronto)

Teaching
A large part of my teaching interests involves designing and integrating course curriculum that facilitates interdisciplinary and applied student learning in the lecture, tutorial and laboratory environment. To date, I have been one of the online and blended learning leads in the Faculty of Science at McMaster, and have developed an array of online modules and resources for blended learning course instruction. This has involved the storyboarding, scripting and recording of online modules *de novo*. The use of online modules has facilitated my ability to develop more applied and interdisciplinary active learning teaching approaches in the face-to-face classroom time, which has significantly improved student engagement, performance and overall course perspectives. My approach to laboratory course design is also strongly rooted in an interdisciplinary project-based approach such that students can build skills across each lab session and are able to tie the material learned to an emerging theme that interconnects between all facets of learning in the course. In additional to my curricular innovations, I am developing a database of auxiliary resources that can be utilized to facilitate student learning of biological concepts in both online and live lectures. This has thus far included audiovisual components that I have integrated into a Blended Learning science classroom

(BIO1A03) and within all other courses that I teach, such as supplementing course material with case-studies, animations, simulations and illustrations. Many of the audiovisual components implemented illustrate my dedication to curate and collect various open-access instructional components from many online resources (ie. DNAtube, iBiology, The Cell Image Library, the DNA Learning Center, Phet Interactive Simulations, YouTube etc).

9. Honours

Teaching

2020 ***Nominee*- President's Award for Outstanding Contributions to Teaching and Learning**
McMaster University
Nomination together with the BIO1A03 Blended Learning Team in recognition of our innovation and commitment to significantly enhancing the quality of student learning

2020 **MSU Innovation Award**
McMaster Student Union, McMaster University
Awarded together with the BIO1A03 Blended Learning Team in recognition of the innovative pedagogical approaches and curriculum design of this first year blended learning and authentic research-based course

2019 **MSU Innovation Award**
McMaster Student Union, McMaster University
Awarded together with the team of the LifeSci2L03 Living Systems Laboratory Course in recognition of the innovative pedagogical approaches and curriculum design of this interdisciplinary lab course

2015 **Teaching Excellence Merit Award**
McMaster Student Union, McMaster University
Awarded in recognition of significant and effective teaching abilities in addition to contributions to the greater McMaster community

2009	**Teaching Assistant of the Year** *University of Toronto Mississauga*	$ 1,000.00

Research

2011	**North American Society for Comparative Endocrinology** *Travel Award for Invited Symposia Speakers*	$ 300.00
2010	**Gordon Cressy Leadership Award** *University of Toronto*	
2010	**Graduate Student Leadership award** *University of Toronto Mississauga*	$ 500.00
2009-2010	**Doctoral Thesis Completion Grant** *University of Toronto*	$ 3,179.00
2008-2009	**Doctoral Thesis Completion Grant** *University of Toronto*	$ 3,424.00
2008	**David F. Mettrick Research Fellowship** *University of Toronto*	$ 476.00
2007	**Frederick P. Ide Research Award** *University of Toronto*	$ 3,840.00
2007-2010	**NSERC Post Graduate Scholarship (PGS D)** *Natural Sciences and Engineering Research Council of Canada (NSERC)*	$ 63,000.00

2004 **Merritt G. Henderson Graduate Scholarship** $ 1,000.00
Trillium Health Center, Mississauga
2003 **Golden Key International Honour Society Award**

10. Courses Taught

a. Undergraduate - McMaster University (2013-present)

Winter 2020 BIO1A03 Cell and Molecular Biology (839 students)
(3 units)

Fall 2019 BIO1A03 Cell and Molecular Biology (829 students)
(6 units) BIO3P03 Cell Physiology (121 students)

Winter 2019 BIO1A03 Cell and Molecular Biology (742 students)
(6 units) LifeSci3L03 Laboratory Methods in Life Sciences (302 students)

Fall 2018 BIO1A03 Cell and Molecular Biology (811 students)
(12 units) BIO3P03 Cell Physiology (102 students)
LifeSci3AA3 Human Pathophysiology (300 students)
ISCI2A18 Drug Discovery (57 students)

Winter 2018 BIO1A03 Cell and Molecular Biology (784 students)
(6 units) LifeSci4U03 Mechanisms of Disease (34 students)

Fall 2017 BIO1A03 Cell and Molecular Biology (805 students)
(12 units) BIO3P03 Cell Physiology (99 students)
LifeSci3AA3 Human Pathophysiology (308 students)
LifeSci3L03 Laboratory Methods in Life Sciences (284 students)

Spring 2017 BIO2B03 Cell Biology (75 students)
(1.5 units)

Winter 2017 BIO1A03 Cell and Molecular Biology (792 students)
(9 units) LifeSci3AA3 Human Pathophysiology (298 students)
LifeSci4U03 Mechanisms of Disease (27 students)

Fall 2016 No courses taught- *maternity leave*

Spring 2016 BIO1A03 Cell and Molecular Biology (80 students)
(1.5 units)

Winter 2016 BIO1A03 Cell and Molecular Biology (641 students)
(7.5 units) BIO2B03 Cell Biology (400 students)
LifeSci4U03 Mechanisms of Disease (40 students)

Fall 2015 BIO1A03 Cell and Molecular Biology (781 students)
(10.5 units) BIO2B03 Cell Biology (384 students)
LifeSci3A03 Health and Disease (300 students)
LifeSci3M03 Cell Dynamics (73 students)

Spring 2015 BIO2B03 Cell Biology (75 students)
(1.5 units)

Winter 2015	BIO1A03 Cell and Molecular Biology (775 students)
(7.5 units)	BIO2B03 Cell Biology (337 students)
	LifeSci4U03 Mechanisms of Disease (37 students)
Fall 2014	BIO1A03 Cell and Molecular Biology (751 students)
(9 units)	BIO2B03 Cell Biology (351 students)
	LifeSci3A03 Health and Disease (287 students)
	LifeSci3M03 Cell Dynamics (107 students)
Spring 2014	BIO1A03 Cell and Molecular Biology (81 students)
(3 units)	
Winter 2014	BIO2B03 Cell Biology (359 students)
(6 units)	BIO2C03 Genetics (278 students)
	LifeSci4P03 Mechanisms of Disease (20 students)
Fall 2013	BIO1A03 Cell and Molecular Biology (694 students)
(9 units)	BIO2B03 Cell Biology (368 students)
	LifeSci3A03 Health and Disease (Guest lecturers during semester) (300 students)
	LifeSci3M03 Cell Dynamics (106 students)

Guest Lectures

2019	MolBiol3B03 Advanced Cell Biology *Principles of fluorescence microscopy*
2019	NeuroSci4S03 Neuroscience Seminar *The coordinated neural networks that underlie physiological processes*
2019, 2018, 2017, 2016	BIO3ZZ3 Topics in Physiology *Targeting pest insect species: a closer look at the BMSB*
2018, 2019, 2020	NeuroSci2XN0 Neuroscience Tutorial *Interactive Lecture-Better knowledge through interdisciplinarity*
2018, 2017	LifeSci2L03 Living Systems Lab *Lecture- An Introduction to the Neuromuscular Junction*
2017	Sci2M03 Engaging your world-Science for the Global Citizen *Lectures- Artificial Intelligence; Antibiotic Resistance*
2017, 2016	MolBIO3D03 Experimental Approaches in Cell Biology *Laboratory Demonstrations- An Introduction to Fluorescence Microscopy*
2014	BIO2D03 Plant Biodiversity and Biotechnology (150 students) *Lecture- Plant Insect Interactions*

Undergraduate - University of Guelph, Biomedical Science-Ontario Veterinary College (2013)

2013	BIOM3040 Medical Embryology (117 students)

Undergraduate - University of Toronto (2010-2013)

2013	BIO310 Integrative Animal Physiology II(UofTMississauga, UTM)(144 students)
2013	BIO270 Animal Physiology (St. George) (111 Students)
2012	BIO409 Laboratory in Physiology (UTM)-*Invited Lecturer* (60 students)
2012	BIO380 Human Development (UTM) (196 students)
2012	BIOB34 Animal Physiology (UofT Scarborough, UTSC) (350 students)
2010	BIO210 Fundamentals of Human Anatomy and Physiology (UTM) (292 students)

b. Graduate

Winter 2020	BIO780 Advanced Techniques in Microscopy (McMaster University) (7 students registered, 3 auditing)
Winter 2018	BIO780 Advanced Techniques in Microscopy (McMaster University) (8 students)
Winter 2016	BIO780 Advanced Techniques in Microscopy (McMaster University) (7 students)
Fall 2015	Education 750-Principles and Practices of University Teaching- *Guest Lecture on Instructional Strategies for Online and Blended Learning- Panel* (14 students)
Winter 2015	BIO780 Advanced Techniques in Microscopy (McMaster University) (8 students)
Winter 2013	Biology of Signal Transduction (UTM)-*Invited Course Evaluator* (9 students)

c. Postgraduate: *Not applicable*
d. Other: *Not applicable*

11. Contributions to Teaching Practice

a. Pedagogical innovation and/or development of technology-enhanced learning

Undergraduate Courses:

BIO2B03- Cell Biology (*2019-present)*

- Collaboration with the Faculty of Science Media Team as the lead faculty member in the Department of Biology that is converting all online course modules in this course into an accessible format, in compliance with 2021 legislative AODA compliance requirements

BIO1A03- Cell and Molecular Biology (*2013- present*)

- Collaboration with BioBlend Committee to restructure the course into a blended format
- Design of all integrated online and applied in-class lectures in collaboration with Dr. Kim Dej (with feedback from committee members)
- Creation and recording of 20 online lectures (modules); now implemented and used in the course
- Creation of concept maps and active learning exercises for use in review sessions; animations as supplementary tools and applied lecture sessions (many concept maps and animations in collaboration with authors and illustrators of *How Life Works* (HLW) textbook, Macmillan Publishing*)*
- Narrator for all online lecture podcasts
- Recording of each redesigned online lecture
- During the 2019-2020 academic year, I have worked once again with the BioBlend Committee to redesign of all course modules to ensure content update, incorporate improvements to course content based on student feedback, and work towards 2021 legislative AODA compliance standard requirements

OUTCOMES: This project has allowed for the collaboration with a team towards building a blended learning model at McMaster Biology that is novel and never before seen in other Biology Departments across Canada. I have given many presentations on behalf of the The BioBlend Team with regards to this Blended Learning model at various teaching and learning symposia and workshops (Gordon Research Conference, Maine USA; Queen's University, Kingston ON; Online and Blended Learning Symposium at McMaster; Society for Teaching and Learning in Higher Education, Sherbrooke QC).

LifeSci3A03/3AA3-Health and Disease/Human Pathophysiology (*2014- 2019)*

- Redesigned the Health and Disease course for students to attain a more relevant and integrated understanding of the aetiology, epidemiology, pathophysiology and treatment of human diseases.
- The course consists of 4 main modules (20 lectures that I created in total) focused on Cardiorespiratory and Neurodegenerative Disorders, Cancer and Neglected Tropical Diseases.
- Designed and implemented biweekly tutorials focused on the process of drug development and distribution which is simultaneously utilized to help students investigate the various professions that are involved in these processes.
- Students also engaged in exercises that mentor them towards science communication towards a broader audience. This is accomplished through a course-wide WikiArticle that students write, highlighting the drug discovery and development process of a multi-purpose drug. In addition to a written communication platform, as of Fall 2018, I implemented a 3-minute Film Fest Video competition that enabled students to convey the manner in which a medicinal drug is able to target malfunctioning cell signaling pathways and alleviate the symptoms associated with disease progression. The Inaugural Film Fest will took place Nov 22-Dec 5, 2018 at McMaster.
- The winning Film Fest group participated in an Experience Day at the pharmaceutical company-Eli Lilly
- Using case-studies, students were also introduced to the process of designing targeted disease therapeutics with the goal of minimizing side effects.

  -Invited Medicinal Chemist guest lecturers from Dr. Patrick Gunning's Group at UofT
  -Invited Medical Advisor guest lecturer from Glaxo-Smith Kline Pharmaceuticals
  -Launch of "Teaching with a Tweet" (Twitter) to help develop student scientific literacy in the digital age (https://twitter.com/@tweetdrd)

OUTCOMES: All modules were very well received by students in this course. The course re-design allowed for the collaborative instruction of Medicinal Chemist guest lecturers from Dr. Gunning's Group at UofT, with focus on rational drug design and therapeutics targeting specific diseases. The invited guest lecturer from Glaxo-Smith Kline provided students with a perspective of alternate career paths in science, while also teaching the process of drug patenting, marketing and distribution.

<u>Undergraduate Pedagogical Innovations:</u>

Undergraduate Cell Biology Lab (*2014- present*)

- This undergraduate cell biology and microscopy laboratory was established in Spring 2015 in collaboration with Dr. Kim Dej, Dr. Roger Jacobs, Alison Cowie and Ryan Belowitz. The facility is available to all undergraduate students and their laboratory and research projects across the Faculty of Science.
- Since the Department of Biology attained the University Fund from the Office of the Provost at McMaster, I was appointed as the faculty member that coordinated the costing, negotiations, ordering and installation of all equipment in the Undergraduate Cell Biology Lab in the Department of Biology. I also work with Zeiss Microscopy to facilitate the training of technicians, TAs and other faculty users of the facility on the various types of microscopes installed in the lab.
- I continue to provide support and training to all students and staff who utilize the space.

OUTCOMES: As of January 2015, a graduate course, **BIO780: Advanced Microscopy Techniques**, was offered for the first time with demonstrations and hands-on learning taking place. With an initial cohort of 10 students, the course continues to be offered every other year and is open to all science graduate students at McMaster. The Department of Biology has since offered a new laboratory course, **MOLBIOL 3D03: Experimental Approaches in Cell Biology**. In this intensive lab course, students characterize morphological properties of cultured cells and observe changes in cell behaviour in response to normal signals, toxins, and environmental cues. Due to the vast array of microscopy tools available in the Cell Biology Laboratory, this lab has been the home of **NEURO3E03: Neuroscience Lab,** a course offering in the new Neuroscience Program at McMaster University and the capstone laboratory course **LIFESCI 4CM3: Foundations of Disease States Inquiry Lab.** The Undergraduate Cell Biology Laboratory is also a space that is utilized year-round by modules from other undergraduate courses. These include **BIO1A03: Cell and Molecular Biology**, **BIO2C03: Genetics, BIO3VV3: Laboratory Methods in Molecular Biology, LifeSci2L03: Living Systems Laboratory** and **BIOPHYS3D03: Origin of Life.** Students engaged in independent and team-based undergraduate research projects (~25 per term) are also frequent users of the Cell Biology Lab. In addition, the Cell Biology Lab has been a space where we have offered workshops and other short courses throughout the year in association various community partners.

Applied Learning Lab for Undergraduate Research Excellence (ALLURE) (*2014- present*)

- In collaboration with Dr. Kim Dej and with FWI funding, I have more formally launched an undergraduate laboratory space (ALLURE) housed in the Burke Science Building as designated undergraduate independent research lab space. Within ALLURE, both Dr. Dej and I have placed specific emphasis on discipline-related undergraduate research excellence, mentoring and enhancing scientific literacy.
- Students in ALLURE are involved in team-projects focused on genetics, cellular and molecular biology, cellular physiology, and systemic physiology. The scientific direction of these projects is at times governed in collaboration with research faculty, and the mentoring of skills, critical thinking, and research methods come from Dr. Dej and myself. This is also the laboratory where Dr. Dej carries out her Nematode Diversity Project work, and where I have established my undergraduate research program focusing on integrated cardiac and immune processes in pest insects such as the Brown Marmorated Stink Bug (BMSB).
- Within the ALLURE lab, we also design and test innovative and exciting new undergraduate laboratories and modules that are directly linked to courses in the Faculty of Science.
- On May 26, 2015 I lead the organization of an Open House to formally launch both the Undergraduate Cell Biology Laboratory and ALLURE (http://dailynews.mcmaster.ca/article/new-labs-to-be-a-game-changer-for-undergraduate-learning/). It was a very well attended event by McMaster faculty, staff and students. Pictures of the event were taken by the Science Medial Lab and have been included as part of McMaster University promotional and recruitment material.

OUTCOMES: As of Fall 2014, I have established the Stink Bug Project in the ALLURE lab. This project required a year to build-up a sustainable breeding colony of the Brown Marmorated Stink Bug (BMSB). The colony is now maintained by all research students working on the project. To date, I have mentored 5-6 students per academic year who have been investigating the integrated cardiovascular and immune mechanisms of these and other agricultural pest insects. While mentoring students in their authentic research experiences, I also support and prepare them to attend various conferences throughout the year. Students have been very successful during their presentations. For example, two students, Irtaza Tahir and Ryan Peters, attended the Insect Biotech Conference in June 2016, and won the best presentation award for long and short oral presentations respectively. This is an excellent achievement given that the competition in this category was comprised primarily of graduate students from many universities across Canada and the United States. Students are encouraged and supported to submit their research for peer-reviewed publication. Manuscripts are currently in preparation.

Biological Illustration Suite (*2014- 2017)*

- Established the Illustration Suite (in collaboration with Dr. Kim Dej) to provide undergraduate students with the opportunity to build a scientific illustration portfolio. This is especially advantageous for students that would like to pursue a career in biomedical or scientific illustration.

OUTCOMES: Students that participated in the Biological Illustration Suite have contributed to providing images for use in many courses, designed posters, and aided faculty with website design within the Department of Biology, along with developing illustrations for popular science magazines and journals (i.e. Artwork by Student Phebe Li for The Scientist Magazine, Artwork by Dilshaayee Prabaharan for the DailyNews at McMaster and the Journal of Experimental Biology). Currently, Dr. Dej has taken the leadership on this project and is moving forward with her Visualizing Science initiative within the School of Interdisciplinary Science at McMaster. In the interim, I continue to support students who are interested in producing illustrations for courses and research labs in the Faculty of Science.

b. Leadership in delivery of educational programs

- **2019-present** Associate Chair, Undergraduate Studies (Department of Biology)
- **2016-2017** Life Sciences Program Coordinator (School of Interdisciplinary Science)
- **2015-2016** Member of Dean of Science's working group to develop a new Living Systems laboratory space for the newly created School of Interdisciplinary Science (SIS) at McMaster University

c. Course and/or curriculum development

Undergraduate Courses:

Redesign of Lecture Content, Tutorials and Homework exercises-
BIO3P03- Cell Physiology

- Incorporated a biological model that is focused on throughout the duration of the course
- Specifically, I redesigned course lectures such that students can now learn concepts pertaining to membrane dynamics, transport across membranes, equilibrium, electrical properties of cells, neurotransmission and synaptic integration, along with the diseases of the nerve and motor unit using the neuromuscular control of mobility as a model of focus. With this new model, students were able to better appreciate how biochemical and biophysical mechanisms regulate the functions of and interactions between two different cell types (neural and muscular) during the control of locomotion
- One of the most positively impacting components that was introduced, was the incorporation of calculation-oriented in-class activities during lecture
- Course tutorials were re-designed to better complement and align with in-class lecture material. This went hand-in-hand with my creation of standardized training sheets and answer keys for all TAs in the course, in addition to standardized Powerpoint presentations that were utilized by all TAs during tutorials
- Designed and incorporated simulation-based activities that enabled students to use the neurophysiology software MetaNeuron to understand the basic and advanced principles in the course
- Created new homework exercises that better complemented the novel course model, and reinforced student learning of lecture and tutorial material

Status: BIO3P03 was re-developed from 2018-2019 and is now in the fully new course format as of Fall 2019

Design and Offering of New Course Module-
ISCI2A18-Drug Discovery

- Re-designed and implemented Drug Discovery Module in the second year course for the Integrated Science (iSci) Program at McMaster University
- This drug discovery module is now more interdisciplinary, combining the disciplines of cell and molecular biology, organic chemistry, genetics and physiology
- The Module runs for 6 weeks, and includes a total of 30hrs of interactive and active learning-based classes that I created and implemented. In addition, I designed a project-based lab that runs over the course of the term, where students experience the drug discovery process first-hand through *in silico* modeling of drug-target interactions, *in vitro* testing of drug-target effectiveness, and carry out an evaluation of *in vivo* effects of drugs on physiological processes in a model organism
- Created and implemented Drug Discovery Film Showcase where students create videos to convey the manner in which a medicinal drug is able to be used for off-label purposes, to target malfunctioning cell signaling pathways and alleviate the symptoms associated with disease progression
- This new interdisciplinary approach not only focuses on the process of drug discovery for medicinal purposes, but also the benefits of drug discovery for basic science research purposes.

Status: First Offered Fall 2018

Design and Offering of New Course-
Sci2M03: Engaging your world-Science for the Global Citizen

- Applied for and attained funding ($70,000) to design and offer this new blended learning course for science and non-science majors.
- Course designed in collaboration with Drs. Kim Dej, Chad Harvey, Sarah Symons, Science Media Lab, Student Research Partners and Project Manager: Jessica Knox
- Course design is centered around encouraging students to make informed decisions on scientific news that they hear on the day to day. In the present climate, where societal norms, political platforms and social responsibility are increasingly challenged, students are encouraged to approach questions pertaining to science with a critical lens
- Students are provided with instruction on some basic scientific principles, confidence in interpreting data, and an ability to engage in discussions that are founded on evidence rather than opinion

Status: First Offered January 2018

Design and Offering of New Course-
LifeSci3L03- Laboratory Methods in Life Sciences
Theme: Laboratory in Comparative & Human Development Lab

- Designed in collaboration with Kim Dej, Ryan Belowitz, Sunita Nadella and Student Research Partners
- As a third year lab course, this course was designed to build upon the skills acquired in LifeSci2L03 and other second year lab courses
- Course is divided into 4 modules, and uses model organisms to understand human development
- This interdisciplinary course was designed to best complement the current course offerings in the Faculty of Science at McMaster

Status: First Offered September 2017

OUTCOMES: The pilot offering of the course was successful. We are currently in the process of developing an Open-Access Atlas of Histology using images acquired by students during the histology modules of the course.

Proposed new Sex, Gender and the Genome course (Proposed Spring 2016)
(Designed in collaboration with Ben Evans, Rama Singh, Juliet Daniel, Andre Bedard & Ian Dworkin- Department of Biology; and Karen Bird- Faculty of Social Sciences)

- Proposed the creation and launch of an interdisciplinary ***Sex, Gender and the Genome*** course that can complement the current course offerings in the Faculty of Science at McMaster, and will also be of interest to students from other faculties.
- With nearly identical human genomes between males and females (with exception of the X and Y chromosomes), this course will broaden student perspectives as to the meaning and significance of these differences, and how this can influence our scientific and cultural understanding of maleness and femaleness.
- *Status*: funding not approved

LifeSci2L03- Living Systems Laboratory (2016-2017)

- Designed a neuromuscular lab module with the model organism *C. elegans* to demonstrate the effects of aging on the cell and molecular mechanisms that coordinate motility and neurotransmission at the skeletal muscle.
- Assisted Dr. Nikol Piskuric with the design of a laboratory module on the neurophysiology of young and aged crickets
- The inaugural offering of the course occurred during Winter 2017. The design of the course has allowed for collaboration between faculty and staff of various disciplines. It is anticipated that undergraduate students will therefore obtain an interdisciplinary perspective on health and aging in this course.
- The course design team (including myself) has received the 2019 McMaster Student Union *Innovation Award*

LifeSci3M03-Cellular Dynamics (First offered Fall 2013)

- Created this course in collaboration with Dr. Kim Dej
- Emphasis of course pertains to the biophysical and biochemical principles that underlie various dynamic cellular processes
- Students were also challenged to develop a mock research grant proposal given the various microscopy and cellular/molecular biology techniques that were presented throughout the term

LifeSci4P03/4U03-Mechanisms of Disease (First offered Winter 2014)

- Created this course and developed the curriculum to provide students with the opportunity to understand current research on how cell signaling pathway malfunction results in disease pathogenesis. Students also considered how targeted drug therapeutics act on various cell signaling pathways to help alleviate symptoms and treat various diseases, while considering off-target side effects

Potential new Human Embryology course (Proposed Fall 2013)

- Proposed the creation and launch of an undergraduate Human Embryology course that can best complement the current course offerings of the Department of Biology and Life Sciences Program. The course would outline human gamete formation, fertilization, normal and abnormal fetal development within a cross-disciplinary context, while also focusing on relevant medical therapeutics and technologies.
- Format would be a fully lecture-based course. *Status*: To be determined

, Graduate Courses:

BIO780-Advanced Microscopy Course (First offered Winter 2015)

- Upon being hired, I proposed to design and offer an Advanced Microscopy course in collaboration with other Faculty of Science faculty members

- The course covers the theoretical and practical applications of various microscopy techniques
- I have taken the lead as course coordinator and instructor (other instructors are: Drs. Deda Gillespie, Roger Jacobs and Bhagwati Gupta)

d. Development/evaluation of educational material and programs

- **2018-present** Faculty Member on National Biology Curriculum Task Force for the Canadian Council of Undergraduate Biology Chairs. The goal of this task force is to evaluate the current biology curriculum across Canadian Universities and make recommendations as to key themes and directions that may contribute to innovations in biological education across Canada.
- **2018-present** Faculty Advisory Board Member for Macmillan Education, STEM Division. As a member of this Board, I regularly advise and consult with Macmillan towards the development of innovative and effective technological resources that can be developed by the company that can be of best benefit to the Science classroom
- **2013-present** Contributing Faculty Member to *How Life Works* textbook (James Morris et al., MacMillan Publishing) "Adopter Camp" to exchange ideas on the development of interactive classroom activities with textbook resources
- **2012 and 2014** Textbook reviewer: Moyes and Schulte Principles of Animal Physiology, 3rd Edition, Pearson Publishing- Published January 2015

e. Other

The STEM Apprentice Experiential Learning Project

- In collaboration with the DeGroote School of Business MARS Apprentice Program, I am currently the lead creator and organizer of this MARS Apprentice offshoot program in the Faculty of Science
- This Apprenticeship program will provide students with the opportunity to create professional fellowships and further their interests in the fields of science, technology, engineering and mathematics by engaging in a group-based experiential learning project.
- Students will complete team-based competitions to solve real-world challenges that are presented by industrial and community partners in the STEM areas. In addition to successfully completing the real-world challenges over a minimum of 60 hours of project work, students will also complete academic components that will be evaluated.

Undergraduate mentoring

The McMaster Mentoring Action Plan (MMAP) (*2015- 2017*)

- In collaboration with Drs. Kim Dej, Ayesha Khan and Nikol Piskuric, we piloted this Forward With Integrity supported undergraduate mentoring program, which provided students with positive and constructive support from a pool of interesting and engaging retired McMaster Faculty and staff.
- The program pilot ran for a total of 4 academic terms (2 years). Each term included a series of workshops and student-mentor discussions which enabled students to be mentored on skills pertaining to time management and productivity, professional etiquette, networking and mapping of their professional development
- At the end of each year, students were able to put into practice the skills that they have acquired at year-end networking event
- We are currently in discussions on how the MMAP can be established as an annual resource for undergraduate students in the Faculty of Science

Science in Hamilton Networking Event (*2014- 2016*)

- This Academic Science Fund supported initiative began in the Fall of 2014 with the collaboration of Trystan Nault (an undergraduate student in the iSci Program). The inaugural event attracted almost 100 students in the Faculty of Science to attend a networking night with local business

and not-for-profit organizations that were interested in recruiting McMaster Science students for various volunteer and placement opportunities.

- Following the great success of the first networking event, I am currently planning this annual event to continue to be funded and organized by the McMaster Science Student Society in collaboration with other undergraduate science student organizations at McMaster. It is anticipated that this event can be one of the main networking events that can attended by the students enrolled in the McMaster Mentoring Action Plan (MMAP)

Contributions to Teaching Practice-University of Guelph (2013)

BIOM3040-Medical Embryology Course

- Redesign of entire Medical Embryology course lectures and laboratories
- Helped all students with the design and preparation of Claymation project that could best describe various embryological events Accessible at: http://www.youtube.com/user/MedEmbryoBIOM3040/videos
- Launch of "Teaching with a Tweet" (Twitter) to help develop student scientific literacy in the digital age (https://twitter.com/@tweetmedembryo)

Contributions to Teaching Practice-University of Toronto (2004-2013)

All courses

- Redesigned various lectures, labs and entire courses (BIOB34, BIO380)
- Incorporated innovative teaching tools that include Twitter in the Classroom, Virtual Office Hours and utilizing Webcasting for lectures
- Lecture-style tutorials immediately after lecture (once weekly), to incorporate current research and clinical applications with course topics
- Creator of an instructional safety video: "Be Smart, Stay Safe!"for use in undergraduate laboratory courses (http://www.vimeo.com/18404603)
- Launch of "Teaching with a Tweet" (Twitter) to help develop student scientific literacy in the digital age (BIO380) (https://twitter.com/@tweethumandev)

Interdepartmental Teaching and Mentoring-*UTM and UTSC*

- Co-supervision and mentoring of research project and theses students (~2 students/year) with the design and experimental procedures of their research projects
- Teaching of new laboratory techniques, animal care and safety (~2 students/year)
- Helping students develop their oral presentation skills for presentations
- Training researchers on how to use advanced microscopes
- Co-developer and presenter of workshops for Graduate Student Mentoring Program
- Co-developer and presenter of various Undergraduate Biology Mentoring Workshops

12. Supervisorships

a. Master: *Not applicable*

b. Doctoral: *Not applicable*

c. Post-doctoral/fellowship:

2020-present **Oana Birceanu** (Wilson Lab)
McCall/MacBain Teaching and Learning Fellowship Program
Horizontal Curriculum Integration in a Biology Program

2020-present **Dennis Kolosov** (O'Donnell Lab)
McCall/MacBain Teaching and Learning Fellowship Program
Horizontal Curriculum Integration in a Biology Program

2020-present **Solmaz Irani** (Weretilnyk Lab)
McCall/MacBain Teaching and Learning Fellowship Program
Impact of Long-Term STEM Engagement Projects on Science Education

d. Clinical/professional: *Not applicable*

e. Supervisory committees:

2019-present **Abdul Halim PhD Student Biology** *The Role of DIR1 and DIR1-like genes during Systemic Acquired Resistance in Arabidopsis*
Primary Supervisor: Dr. Robin Cameron; Other committee members: Dr. Elizabeth Weretilnyk

2019-present **Wantao (Noah) Xiao MSc Student Biology** *Biofilm Formation During PAMP-Triggered Immunity and Exploration of Systemic Acquired Resistance in Arabidopsis*
Primary Supervisor: Dr. Elizabeth Weretilnyk; Other committee members: Dr. Robin Cameron

2019-present **Christine West PhD Student Biology** *Characterizing the Functional Nature of Nervous Communication Between Gut and Brain*
Primary Supervisor: Dr. Wolfgang Kunze; Other committee members: Dr. Paul Forsythe, Dr. Elyanne Ratcliffe

September 2019 **MSc. Examination Chair,** Soren Coulson (McClelland Lab, Biology)
Changes in Metabolic Regulation of the Carbohydrate Oxidative Pathway in Exercising High Altitude Deer Mice

August 2019 **MSc. to PhD Transfer Exam,** Alana Tedeschi (Chow-Fraser Lab, Biology)
Science and Volunteerism in Monitoring Soluble Reactive Phosphorous in the Grand River

2014-2017 **Shamaila Fraz PhD Student Biology** *The Effect of Gemfibrozil and Carbamazepine on the Reproduction of Zebrafish*
Primary Supervisor: Dr. Joanna Wilson; Other committee members: Dr. Ana Campos, Dr. Rosa da Silva, Dr. Glenn Van Der Kraak

April 2014 **MSc. Examination Chair**, Dallas Taylor (Chow-Fraser Lab, Biology)
Long-term effects of impoundment on ecosystem functions of coastal wetlands in Georgian Bay

January 2014 **MSc. Examination Chair**, Jessica Knox (Gupta Lab, Biology)
Wnt Signaling in *C. elegans*

f. Other: Undergraduate projects, theses, placement and volunteer students

2020

- **Kyle Amaral- BIO4C12** *Effects of entomopathogenic fungi on the mealworm, Tenebrio molitor* (Sept 2019-April 2020)
- **Marry Nissan-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2019-April 2020)
- **Hetta Patel-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2019-April 2020)

2019

- **Aakanx Panchal and Jonathan Zaslavsky- iSci2A18 Enrichment Project** *Attacking Chemotherapy Resistance Using DNA Nanotechnology (A systematic review)*. (Feb-April 2019) Primary Advisor: Dr. Rosa da Silva
- **Abhigyan Dwivedi and Maha Dogar- iSci2A18 Enrichment Project** *Investigating and Modeling Antibiotic Resistance using Pseudomonas aeruginosa and Exploring Novel Antibiotic Discoveries (A systematic review)*. (Feb-April 2019) Primary Advisor: Dr. Rosa da Silva
- **Riddhi Bhatt and Alexander McGrath-Santowski- iSci2A18 Enrichment Project** *Antimalarial Drug Resistance (A systematic review)*. (Feb-April 2019) Primary Advisor: Dr. Rosa da Silva
- **Caitlin Reintjes and Yona Tugg- iSci2A18 Enrichment Project** *Remodeling Chemotherapy with Individualized Cancer Treaments: An Integrated Approach (A systematic review)*. (Feb-April 2019) Primary Advisor: Dr. Rosa da Silva
- **Christy Au-Yeung and Maisha Ahmed- iSci2A18 Enrichment Project** *Alzeheimer's Disease Causal Mechanisms: A Biochemical and Mathematical Perspective (A systematic review and a model simulation)*. (Feb-April 2019) Primary Advisors: Dr. Rosa da Silva and Dr. George Dragomir
- **Sarah Scott and Jalen Singh - iSci2A18 Enrichment Project** *The Techniques and Applications of Gene Therapy (A systematic review)*. (Feb-April 2019) Primary Advisor: Dr. Rosa da Silva
- **Sonia Jarvie- BIO4C12** *Effects of entomopathogenic fungi on the metabolism of the brown marmorated stink bug* (Sept 2018-April 2019) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. JP Xu
- **Jake McNairn-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2018-April 2019)
- **Raquel Deperasinski** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2018-April 2019)
- **Faryal Zahir- BIO4C12** *Efficacy of robotic-assisted gait training/body-weight support treadmill training for spinal cord injuries* (Sept 2018-April 2019) Primary Supervisor: Dr. Agnes Chmiel; Co-supervisor: Dr. Rosa da Silva
- **Akanksha Arora-BIO4C12** *Temperature effects on developmental phenotypes of whitefish* (Sept 2018-April 2019) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Michelle Brown-Research Assistant/Student Scholar-***Horizontal Curriculum Integration in a Biology Program* (May 2019- September 2019) Primary Supervisor: Dr. Rosa da Silva; Co-supervisors: Dr. Robin Cameron, Abeer Siddiqui, Alastair Tracey
- **Michelle Armstrong-Research Assistant/Student Scholar-***Horizontal Curriculum Integration in a Biology Program* (May 2019- September 2019) Primary Supervisor: Dr. Rosa da Silva; Co-supervisors: Dr. Robin Cameron, Abeer Siddiqui, Alastair Tracey
- **Kyle Amaral- BIO4C12** *Effects of entomopathogenic fungi on the mealworm, Tenebrio molitor* (Sept 2019- April 2020)
- **Marry Nissan-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2019- April 2020)
- **Hetta Patel-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2019- April 2020)
- **Angela Tobia-Research Assistant/Student Scholar-***Horizontal Curriculum Integration in a Biology Program* (May 2019- June 2020) Primary Supervisor: Dr. Rosa da Silva; Co-supervisors: Dr. Robin Cameron, Abeer Siddiqui, Alastair Tracey

2018

- **Faryal Zahir- BIO3EP3**- *Placement at Integrative Health Centre- Shadowing sports medicine physiotherapists* (Jan-April 2018) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Jennifer Abbiss-Somerville
- **Simon Pollard- BIO4C09** *Transgenerational effects of carbamazepine and gemfibrozil on the courtship and sperm morphology in the F4 generation of Danio rerio* (Sept 2017-April 2018) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Jasmine Bhatti- BIO4C09** *Startle response in Lake Whitefish (Coregonus clupeaformis) and Round Whitefish (Prosopium cylindraceum) following exposure to temperature stress during embryonic development* (Sept 2017-April 2018) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Victoria Van Mierlo- BIO4C09** *Effects of entomopathogenic fungi on the brown marmorated stink bug* (Sept 2017-April 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. JP Xu
- **Sonia Jarvie- BIO4C12** *Effects of entomopathogenic fungi on the metabolism of the brown marmorated stink bug* (Sept 2018-April 2019) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. JP Xu
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- **Akanksha Arora-BIO4C12** *Temperature effects on developmental phenotypes of whitefish* (Sept 2018-April 2019) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Sonia Jarvie-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2017-Sept 2018)
- **Jake McNairn-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2018-present)
- **Raquel Deperasinski** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2018-present)
- **Hibo Rijal-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2017-Dec 2018)
- **Irtaza Tahir-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- June 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey
- **Victoria Van Mierlo-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2017- June 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey

2017

- **Manprit Kaur-LifeSci4EP6**- *Placement at Department of Health Sciences-McMaster University, Education and Curriculum Development* (Sept 2016-April 2017) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Elizabeth dos Santos
- **Wayne Yeung- Pharm4F09** *Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- April 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey
- **Victoria Giglio- BIO4C09** *Experimental adaptation of P. destructrans to various temperature conditions* (Sept 2016- April 2017) Primary Supervisor: Dr. JP Xu; Co-supervisor: Dr. Rosa da Silva
- **Caitlin West- BIO4C09** *Effects of temperature exposure on juvenile phenotypes* (Sept 2016-April 2017) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Margaret Lu- BIO4C09** *The effect of Cryptococcus neoformans on the immune response of the Brown Marmorated Stink Bug* (Sept 2016- April 2017) Primary Supervisor: Dr. Rosa da

Silva; Co-supervisor: Dr. JP Xu

- **Victoria Radausakas- BIO4C09** *Immune and cardiac challenges induced in the brown marmorated stink bug when infected with encapsulated fungi* (Sept 2016- April 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. Roger Jacobs
- **Victoria Van Mierlo- BIO3IR3** *Immune and cardiac physiology of the brown marmorated stink bug (Jan-April 2017)* Academic Supervisor: Dr. Rosa da Silva
- **Tina Canto- LifeSci3RP3** *Experimental design and implementation of Physiology Lab Modules for LifeSci3L03* (May-June 2017) Primary Supervisor: Dr. Rosa da Silva
- **Simon Pollard- BIO4C09** *Transgenerational effects of carbamazepine and gemfibrozil on the courtship and sperm morphology in the F4 generation of Danio rerio* (Sept 2017-April 2018) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Jasmine Bhatti- BIO4C09** *Startle response in Lake Whitefish (Coregonus clupeaformis) and Round Whitefish (Prosopium cylindraceum) following exposure to temperature stress during embryonic development* (Sept 2017-April 2018) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Victoria Van Mierlo- BIO4C09** *Effects of entomopathogenic fungi on the brown marmorated stink bug* (Sept 2017-April 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. JP Xu
- **Sonia Jarvie-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2017-present)
- **Tina Canto-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance* (May 2017-present)
- **Victoria Radauskas-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- June 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey
- **Irtaza Tahir-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- June 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey
- **Victoria Van Mierlo-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2017- June 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey

2016

- **Nabil Hawwa-BIO3EP3**- *Placement at Halton Family Health Centre-Physician Shadowing* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Frances Battaglia
- **Alisa Bozzo- LifeSci3EP3**- *Placement at Holy Name of Mary Elementary School- Teacher Assistant* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Irene Wilson
- **Elise Mac Lean- LifeSci3EP3**- *Placement at William Osler Health System- Shadowing doctors within Medicine/Nephrology Department* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Rosa Marticorena
- **Kimberly Dias-LifeSci3EP3**- *Placement in the Emergency Department at the Hospital for Sick Children- Paediatric Research Academic Initiative in SickKids Emergency (PRAISE) Volunteer* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Johanna Crudden
- **Manprit Kaur-LifeSci3EP3**- *Placement at the Juravinski Hospital-Elder Life Program Volunteer* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Kelly Turner
- **Natasha Labana-LifeSci3EP3**- *Placement at Activ8 Clinic- Physiotherapist and Chiropractor Shadowing* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Amanda Scione

- **Wanyao (Yoyo) Chen-LifeSci3EP3**- *Placement at McMaster Children's Hospital- Pediatric Neuro-Oncologist Shadowing* (Jan-April 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Dr. Adam Fleming
- **Charandeep Farma**- **LifeSci3EP3**-*Curriculum Development Lab Assistant for BIO1A03 Cell and Molecular Biology* (Sept-Dec 2016) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Alastair Tracey
- **Ryan Peters-BIO3IR3**- *Characterizing the immune response of the Brown Marmorated Stink Bug* (Jan-April 2016) Primary Supervisor: Dr. Rosa da Silva
- **McMaster Genetically Engineered Machines (mGEM) Team** *Engineered Commensal Bacteria for the Treatment of GI Carcinomas* (Spring-Summer 2016) Primary Lab Supervisor: Alison Cowie
- **Gabrielle Retta-LifeSci3RP3**-*Characterization of the immune system of the Brown Marmorated Stink Bug* (Sept- Dec 2016) Primary Supervisor: Dr. Rosa da Silva
- **Lauren Tabone-BIO4C09** *Investigating the impact of the SAMR (Substitution, Augmentation, Modification, Redefinition) model on student learning when integrating social media and teaching technologies in the science classroom* (Sept 2015-April 2016; *MREB protocol in preparation*) Primary Supervisor: Rosa da Silva; Co-supervisor: Dr. Kim Dej
- **Chloe Bair-Marshall-BIO4C09** *Confocal imaging of developing excitatory circuitry* (Sept 2015-April 2016) Primary Supervisor: Dr. Deda Gillespie; Co-supervisor: Dr. Rosa da Silva
- **Irtaza Tahir-LifeSci4C09** *Nitric oxide regulation of Brown Marmorated Stink Bug cardiac activity* (Sept 2015-April 2016) Primary Supervisor: Dr. Rosa da Silva
- **Krishna Srinivasan-BIO4C09** *The Effects of Pharmaceutical Exposures on the Development of Zebrafish* (Sept 2015-April 2016) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Margaret Lu- BIO4C09** *The effect of Cryptococcus neoformans on the immune response of the Brown Marmorated Stink Bug* (Sept 2016- April 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. JP Xu
- **Victoria Radausakas BIO4C09** *Immune and cardiac challenges induced in the brown marmorated stink bug when infected with encapsulated fungi* (Sept 2016- April 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Dr. Roger Jacobs
- **Victoria Van Mierlo** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance (Sept-Dec 2016)*
- **Wayne Yeung- Pharm4F09** *Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- April 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey
- **Victoria Giglio- BIO4C09** *Experimental adaptation of P. destructrans to various temperature conditions* (Sept 2016- April 2017) Primary Supervisor: Dr. JP Xu; Co-supervisor: Dr. Rosa da Silva
- **Caitlin West- BIO4C09** *Effects of temperature exposure on juvenile phenotypes* (Sept 2016-April 2017) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Manprit Kaur-LifeSci4EP6**- *Placement at Department of Health Sciences-McMaster University, Education and Curriculum Development* (Sept 2016-April 2017) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Elizabeth dos Santos
- **Victoria Radauskas-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- June 2017) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey
- **Irtaza Tahir-Research Assistant/Student Scholar-***Assessing the outcomes of Blended Learning in a Level I Biology Course* (Sept 2016- June 2018) Primary Supervisor: Dr. Rosa da Silva; Co-supervisor: Alastair Tracey

2015

- **Claude Nasseh**- **BIO3EP3**- *Placement at Smile Smile Dental Office* (Sept-Dec 2015) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Dr. Hyam Karam
- **Peter Mikhail-BIO3EP3**-*Placement at Britannia Dental Centre* (Sept-Dec 2015) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Dr. Sherif Sorial
- **Wayne Yeung-BIO3EP3** *Placement towards the implementation of the Learning Portfolio in BIO1A03 Cell and Molecular Biology* (Sept-Dec 2015) Academic Supervisor: Dr. Kim Dej; Placement Supervisor: Dr. Rosa da Silva
- **Rupinder Chahal-LifeSci3EP3** *Placement at Medical Care Centre-Physician Shadowing* (Jan-April 2015) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Dr. Jaskaran Singh
- **Phebe Li-LifeSci3EP3** *Placement in Biological Illustration Suite at McMaster* (Summer 2015)
  Academic Co-supervision with Dr. Kim Dej*;* Placement Supervisors: The Scientist Magazine Art Director, Lisa Modica
- **Irtaza Tahir-LifeSci3RP3** *Characterizing the immune response of the Brown Marmorated Stink Bug* (Spring-Summer 2015) Academic Supervisor: Dr. Rosa da Silva
- **McMaster Genetically Engineered Machines (mGEM) Team** *Multi-chromatic Light Controlled Protein Expression and Autolysis in E.coli* (Spring-Summer 2015) Co-adviser with Dr. Kim Dej and Dr. Marie Elliot; Primary Lab Supervisor: Alison Cowie
- **Eli Jany-BIO4C09**- *An identification of the localization of reactive oxygen species in plant roots* (Summer 2015). Assisting student with the experimental design and microscopic imaging. Primary Supervisor: Dr. Elizabeth Weretilnyk
- **Rajesh Shah-LifeSci3RP3** *Investigating the Cardiac Regulation of the Brown Marmorated Stink Bug* (Sept - Dec 2015) Academic Supervisor: Dr. Rosa da Silva
- **Lauren Tabone-BIO4C09** *Investigating the impact of the SAMR (Substitution, Augmentation, Modification, Redefinition) model on student learning when integrating social media in the science classroom* (Sept 2015-April 2016; *MREB protocol in preparation*) Primary Supervisor: Rosa da Silva; Co-supervisor: Dr. Kim Dej
- **Chloe Bair-Marshall-BIO4C09** *Confocal imaging of developing excitatory circuitry* (Sept 2015-April 2016) Primary Supervisor: Dr. Deda Gillespie; Co-supervisor: Dr. Rosa da Silva
- **Irtaza Tahir-LifeSci4C09** *The effect of plant-derived toxins on the immune system of the Brown Marmorated Stink Bug* (Sept 2015-April 2016) Primary Supervisor: Dr. Rosa da Silva
- **Krishna Srinivasan-BIO4C09** *The Effects of Pharmaceutical Exposures on the Development of Zebrafish* (Sept 2015-April 2016) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva

2014

- **Seema Mehta-BIO3EP3** *Placement at Team Maple Walk-in Clinic & Family Practice* (Jan-April 2014) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisory: Dr. Mahreen Razzaq
- **Daniel Hsieh-BIO3EP3** *Placement in Biological Illustration Suite at McMaster* (Summer 2014) Co-supervision with Dr. Kim Dej
- **Yvette Kuo-LifeSci3EP3** *Placement in Biological Illustration Suite at McMaster* (Summer 2014) Co-supervision with Dr. Kim Dej
- **Ahmed Al-Shafayeen-BIO3IR3** *Developmental Plasticity of Inhibitory Circuits* (Sept-Dec 2014) Primary Supervisor: Dr. Deda Gillespie; Co-supervisor: Dr. Rosa da Silva
- **Ana Kovacevic-BIO3EP3** *Disseminating Scientific Knowledge to Patients* (Sept 2014-April 2015 by permission) Placement Supervisor: Dr. Kjetil Ask; Academic Supervisor: Dr. Rosa da Silva
- **Kamika Sylvester-LifeSci3EP3** *Nursing Placement at Toronto General Hospital-General Surgery, Medical Surgery Day Unit and Gyne-Urology Units* (Summer 2014) Academic

Supervisor: Dr. Rosa da Silva Placement Supervisors: Joseph (Nurse Educator) and Marcia (Nurse Manager)

- **Hojin Choi-LifeSci4EP6** *Physiotherapy placement at AIM Health Group* (Sept 2014-April 2015) Academic Supervisor: Dr. Rosa da Silva; Placement Supervisor: Julie Ratelle
- **Giuliana Guarna-BIO4F06** *Social Media in the Science Classroom* (Sept 2014-April 2015; *MREB2014 166*) Primary Supervisor: Rosa da Silva; Co-supervisor: Dr. Kim Dej
- **Dana Abu-Jazar-BIO4C09** *Knowledge Translation to Patients with COPD* (Sept 2014-April 2015) Primary Supervisor: Dr. Kjetil Ask; Co-supervisor: Dr. Rosa da Silva
- **Edwin Wong-BIO4C09** *Effects of PAOPA on the cognitive deficits of Schizophrenia* (Sept 2014-April 2015) Primary Supervisor: Dr. Ram Mishra; Co-supervisor: Dr. Rosa da Silva
- **Meha Bhatt-BIO4C09** *Interpersonal Violence in Males* (Sept 2014-April 2015) Primary Supervisor: Dr. Mohit Bhandari; Co-supervisor: Dr. Rosa da Silva
- **Natalie Richard-BIO4C09** *The Effects of Chronic Analgesic Exposure on the Development of Zebrafish in Early Life Stages* (Sept 2014-April 2015) Primary Supervisor: Dr. Joanna Wilson; Co-supervisor: Dr. Rosa da Silva
- **Irtaza Tahir-Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance (Oct 2014-present)*
- **Rajesh Shah- Volunteer** *Brown Marmorated Stink Bug (BMSB) Colony Care and Maintenance (Fall-Winter 2014)*

13. Lifetime Research Funding

Awarded

2020

NSERC Promoscience $37, 000
The STEM Engagement Project (StEP)
Co-Applicant: Drs. Rosa da Silva, Elizabeth Weretilnyk and Juliet Daniels

2018

McMaster Leadership in Teaching and Learning Fellowship $15,000.00
Horizontal Curriculum Integration within a Biology Program
Co-Applicants: Dr. Robin Cameron, Abeer Siddiqui and Alastair Tracey

2016

McMaster Science Society- Academic Science Fund $15, 000.00
Histology in Science
Applicants: Leanne Zubowski (Student) and Dr. Sunita Nadella
Contributing authors: Drs. Rosa da Silva and Kim Dej

Strategic Alignment Fund-Office of the Provost- McMaster $70, 000.00
Development of "Science for Non-science Students" course-
Science for the Global Citizen
Co-Applicants: Drs. Kim Dej, Rosa da Silva, Chad Harvey,
Sarah Symons, Sarah Robinson

McMaster Leadership in Teaching and Learning Fellowship $15,000.00
Assessing the outcomes of Blended Learning
in a Level I Biology Course

2015

McMaster Science Society- Academic Science Fund $15,831.86
Optimizing Learning with Microscopic Imaging
Co-Applicants: Dr. Ana Campos Prateik Murali, (Student),
Nischal Sharma (Student)
Contributing authors: Drs. Rosa da Silva and Kim Dej

McMaster University- Forward With Integrity $ 5, 000.00
The McMaster Mentoring Action Program (MMAP)
for Undergraduate Students in Science
Co-Applicants: Betty-Ann Levy, Dr. Kim Dej,
Dr. Nikol Piskuric, Dr. Ayesha Khan, Dr.Rosa da Silva

McMaster Science Society- Academic Science Fund $ 6, 495.00
Learning with Model Organisms
The McMaster Stink Bug Project
Co-Applicants: Dr. Rosa da Silva and Kalaisan Kalaichelvan (Student)

McMaster University- Forward With Integrity $ 9, 500.00
Meta-data analysis of the Learning Portfolio: from data to prediction
(Learning Portfolio Fellowship)
Principal Investigator: Dr. Andrew McArthur and Co-investigator: Dr. Rosa da Silva

2014

McMaster Science Society- Academic Science Fund $ 3, 000.00
Science in Hamilton Experiential Learning Symposium
and Networking Night
Co-Applicants: Dr. Rosa da Silva and Trystan Nault (Student)

McMaster University- Forward With Integrity $ 9, 500.00
Building an effective database: meta-data analysis of the Learning Portfolio
(Learning Portfolio Fellowship)
Principal Investigator: Dr. Rosa da Silva and Co-investigator: Dr. Andrew McArthur

McMaster University- Forward With Integrity $ 4, 854.00
The Applied Learning Laboratory for Undergraduate
Research Excellence (ALLURE)
Co-Applicants: Dr. Rosa da Silva and Dr. Kim Dej

McMaster University Internal Strategic Alignment Fund $ 217, 406.00
Towards establishing an Undergrad Cell Bio Lab on
behalf of the Department of Biology
Contributing authors: Drs. Roger Jacobs, Kim Dej and Rosa da Silva

McMaster Science Society- Academic Science Fund $ 7, 350.00
Towards Purchasing a UV Spectrophotometer (BIO3VV3)
Co-Applicants: Alison Cowie, Valentina Cardozo (Student) and Dr. Rosa da Silva

McMaster Science Society-Academic Science Fund $ 4, 540.00
Establishing a Biological Illustration Suite at McMaster
Co-Applicant: Dr. Rosa da Silva and Dr. Kim Dej

14. Lifetime Publications

a. Peer Reviewed

i. Books: *Not applicable*

ii. Contributions to books: *Not applicable*

iii. ***journal articles:***

14. Velasco VME, Irani S, Axakova A, **da Silva R**, Summers PS & EA Weretilnyk. (2019) Evidence that tolerance of *Eutrema salsugineum* to low phosphate conditions is hard-wired by constitutive metabolic and root-associated adaptations. *Planta*. 251:18.

13. Defferrari MS, **da Silva R**, Orchard I & CR Carlini. (2014) Jack bean urease induces hemocyte aggregation in the Chagas disease vector. *Toxicon*. 82:18-25.

12. Pustylnik S, Fiorino C, Nabavi N, Zappitelli T, **da Silva R**, Aubin JE & RE Harrison. (2013) EB1 levels are elevated in ascorbic Acid (AA)-stimulated osteoblasts and mediate cell-cell adhesion-induced osteoblast differentiation. *J Biol Chem*. 288: 22096-22110.

11. Bhatt G, **da Silva R**, Nachman RJ & I Orchard. (2013) The molecular characterization of the kinin transcript and the physiological effects of kinins in the blood-gorging insect, *Rhodnius prolixus*. *Peptides*. 53:148-158.

10. Lee D, Taufique H, **da Silva R** & AB Lange. (2012) An unusual myosuppressin from the blood-feeding bug *Rhodnius prolixus*. *J Exp Biol*. 215(Pt 12):2088-95.

9. **da Silva R**, da Silva SR & AB Lange. (2012) The regulation of cardiac activity by nitric oxide (NO) in the Vietnamese stick insect, *Baculum extradentatum*. *Cell Signal*. 24(6):1344-50.

8. **da Silva R** & AB Lange. (2011) Evidence of a central pattern generator regulating spermathecal muscle activity in *Locusta migratoria* and its coordination with oviposition. *J Exp Biol*. 214: 757-763.

7. da Silva S, **da Silva R** & AB Lange. (2011) Effects of crustacean cardioactive peptide on the hearts of two Orthopteran insects, and the demonstration of a Frank-Starling-like effect. *Gen Comp Endocrinol*. 171(2):218-24.

6. Orchard I, Lee DH, **da Silva R** & AB Lange. (2011) The proctolin gene and biological effects of proctolin in the blood-feeding bug, *Rhodnius prolixus*. *Front Endocrinol (Lausanne)*. 2:59.

5. Lange AB, Calvin A & **R da Silva**. (2009) Neuropeptides modulate the heart of the stick insect *Baculum extradentatum*. *Ann NY Acad Sci*. 2009. 1163:448-50.

4. **da Silva R** & AB Lange. (2008) Tyramine as a possible neurotransmitter/neuromodulator at the spermatheca of the African migratory locust, *Locusta migratoria*. *J Insect Physiol*. 54(8):1306-13.

3. Lange AB & **R da Silva**. (2007b) Neural and hormonal control of muscular activity of the spermatheca in the locust, *Locusta migratoria*. *Peptides*. 28(1):174-84.

2. Lange, AB & **R da Silva**. (2007a) Peptidergic innervation of the excurrent ostia of two Orthopteroid insects. *Pestycydy*. (3-4):11-16.

1. **da Silva R** & AB Lange. (2006) The association of crustacean cardioactive peptide with the spermatheca of the African migratory locust, *Locusta migratoria*. *J Insect Physiol*. 52(4):399-409.

iv. Research creation and artistic contributions: *Not applicable*
v. Journal abstracts: *Not applicable*
vi. Other, including Proceedings of Meetings: *Not applicable*

b. Not Peer Reviewed

i. Books:

da Silva R (2008) The Ten Most Uncontrollable Functions of the Body. Scholastic Canada *ISBN#: 9781554483310*

ii. Contributions to books: *Not applicable*
iii. Journal articles: *Not applicable*
iv. Research creation and artistic contributions: *Not applicable*
v. Journal abstracts: *Not applicable*
vi. Other **Popular Talks, Interviews and Media Articles**

Balch, E. "McMaster Science students go behind the scenes at Eli Lilly Canada" *McMaster Daily News*, 17 June, 2019. Web.

da Silva R. "Gene Expression in a Gene Editing Era" *McMaster University Alumni Association- For the Curious Mind Lecture Series* (YouTube), 31 May, 2019. Web.

da Silva R. "Why there may be thousands of stink bugs hiding under your sofa" *The Conversation*, 28 October, 2018. Web.

- Reprints include:
  The National Post, 29 October, 2018
  The Weather Network, 29 October, 2018
  McMaster Brighter World, 29 October, 2018

Clementson, L. "Fish fly takes Caledonia by storm during breeding season" *CBC Hamilton*, 9 August, 2017. Web.

da Silva, R. "It's the most wonderful time of the year- for mosquitoes" *McMaster Brighter World*, 1 August, 2018. Web.

Robinson, M. "Fantastic bugs and where to find them" *Toronto Star Touch App*, 29 January, 2016. Web.

da Silva, R. "Why grasshoppers are plaguing Alberta's farms" *McMaster Daily News*, 27 July, 2018. Web.

Balch, E. "New labs to be a 'game changer' for undergraduate learning" *McMaster Daily News*, 24 July, 2015. Web.

McNeil, M. "Hold your nose: those stinky bugs are back" *Hamilton Spectator*, 8 April, 2015. Web & Print

Terry, M. "Biology has a new project for undergrads – and it stinks" *McMaster Daily News*, 25 September, 2014. Web.

McNeil, Mark. "Wanted in Hamilton: thousands of brown marmorated stink bugs" *Hamilton Spectator*, 30 September, 2014. Web & Print.

c. Accepted for Publication: *Not applicable*
d. Submitted for Publication: *Not applicable*
e. Unpublished Documents:
i. Technical report series: *Not applicable*
ii. Other:

Tabone L, & **R da Silva** (*in preparation*) Integrating social media and technology into the high school biology classroom to increase student scientific literacy. *To be submitted to American Society of Cell Biologists-Life Sciences Education Journal*.

Guarna G, & **R da Silva** (*in preparation*) Teaching with a Tweet. *To be submitted to American Society of Cell Biologists-Life Sciences Education Journal*.

Szeto V, **da Silva R** & AB Lange (*in preparation*) The mode of action of octopamine on the cardiac activity of the Indian stick insect, *Carausius morosus*. *To be submitted to the Journal of Insect Physiology*.

Tahir I, Peters RJ, Radauskas R, Lange AB, & **R da Silva** (*in preparation*) Nitric oxide is an endogenous regulator of cardiac activity in the brown marmorated stink bug, *Halyomorpha halys*. *To be submitted to the journal Cellular Signalling*.

15. Presentations at Meetings

a. Invited

da Silva R. Blended Learning in a Biology Course. *Ontario Majors Biology Teaching Symposium-Macmillan Learning*, McMaster University, Hamilton, Canada. October 2018.

Tahir I, Radauskas V, Van Mierlo V, Yeung W & **R da Silva**. Blended Learning: An evidence-based approach towards teaching with meaning and application to the real world. *McMaster University President's Retreat,* McMaster University, Hamilton, Canada. October 2018.

da Silva R, Dej, K & A Tracey. A Blended Learning Approach to Teaching First Year Cell and Molecular Biology. Poster presented at: *Gordon Conference in Undergraduate Biology Education Research*. Lewiston, USA. July, 2015.

da Silva R, **Palmen H, Kyriakos Z, Krapez K & N Perepelkin**. A Pedagogical Case Study: Teaching with Multiple Instructors. *International Management Teachers Academy*. Bled, Slovenia. June, 2015.

da Silva R & K Dej. Blended Learning at McMaster University. *How Life Works Adopter Camp*. Boston, USA October, 2014.

da Silva R. Teaching Beyond the Textbook: Student Driven Learning via Social Media. *Pearson Biology Leadership Forum*. Toronto, Canada. May 2014.

da Silva R, da Silva S & AB Lange. The regulation of cardiac activity by the unconventional gaseous signaling molecule, nitric oxide, in the Vietnamese stick insect, *Baculum extradentatum*. *VOX Physiologica***.** Hamilton, Canada. February 2014.

da Silva R. Creating Opportunities: it's not all about luck. *TEDx McMaster***.** Hamilton, Canada. February 2014.

da Silva R & AB Lange. The regulation of insect cardiac activity and a Frank-Starling-like mechanism. *North American Society for Comparative Endocrinology***.** Ann Arbor, USA. July 2011.

da Silva R & AB Lange. The control of spermathecal activities in the migratory locust, *Locusta migratoria***.** *Invertebrate Neuropeptide Conference*. Merida, Mexico. February 2010.

da Silva R & AB Lange. Neurochemicals associated with the spermatheca of the African migratory locust, *Locusta migratoria***.** *Invertebrate Neuropeptide Conference***.** Guanajuato, Mexico. February 2006.

b. Contributed

i) Peer reviewed

Jarvie S, Van Mierlo V, Samarasinghe H, Xu JP & **R da Silva**. The effects of the entomopathogenic fungus, *C. neoformans*, on integrated systems of the yellow mealworm. *Insect Biotech Conference*. Niagara-on-the-Lake, Canada. June 2019.

Tahir I, Radauskas V, Van Mierlo V, Yeung W & **R da Silva**. Blended Learning in a Biology Classroom. *McMaster University Learning Technologies Symposium,* McMaster University, Hamilton, Canada. October 2018.

Van Mierlo V, Radauskas V, Tahir I, Samarasinghe H, Xu JP & **R da Silva**. Interactions between the insect immune system and their pathogens. *Insect Biotech Conference*. Niagara-on-the-Lake, Canada. June 2018.

Tahir I, Radauskas V, Van Mierlo V, Tracey A & **R da Silva**. Blended Learning in a Science Classroom. *Society for Teaching and Learning in Higher Education Annual Conference*. Sherbrooke (QC), Canada. June 2018

Tahir I & **R da Silva**. Analysis of Blended Learning in BIOLOGY1A03: Student Outcomes and Perceptions. *Student Partnership Symposium*, McMaster University, Hamilton, Canada. April 2018.

Mobarak O, Zeng Q, Dej K, Knox J, Symons S, **da Silva R** & C. Harvey. SCIENCE2M03: Science for the Global Citizen. *Student Partnership Symposium*, McMaster University, Hamilton, Canada. April 2018.

Radauskas VJ, Mierlo VV, Tahir I & **R da Silva**. Utilizing entomopathogenic fungi to investigate the physiology of the brown marmorated stink bug immune response. *Insect Biotech Conference*. Niagara-on-the-Lake, Canada. June 2017.

Tahir I, Peters RJ, Lange AB & **R da Silva**. Regulation of the cardiac system of the brown marmorated stink bug by the gaseous signaling molecule nitric oxide. *Insect Biotech Conference*. St. Catherines, Canada. June 2016.

Peters RJ, Tahir I & **R da Silva**. Characterization of the immune system of the brown marmorated stink bug. *Insect Biotech Conference*. St. Catherines, Canada. June 2016.

Tahir I, Peters RJ, Lange AB & **R da Silva**. Targeting pest insect species: a closer look at the physiology of the brown marmorated stink bug. *Ontario Fruit and Vegetable Convention*. Niagara Falls, Canada. February 2016

Dej K & R da Silva. Re-envisioning First Year Biology. *Learning Technologies Symposium*. MacPherson Institute-McMaster University, Hamilton, Canada. May 2015.

da Silva R. Stepping Away from the Ordinary: The restructuring of BIO1A03. *Blended Learning Symposium at McMaster University*. Hamilton, Canada. December, 2014.

da Silva R, da Silva S & AB Lange. The Regulation of Cardiac Activity by the Unconventional Gaseous Signaling Molecule, Nitric Oxide in the Vietnamese Stick Insect, *Baculum extradentatum*. *Insect Biotech Conference*. St Catherines, Canada. June 2014.

da Silva R, da Silva S & AB Lange. The effects of crustacean cardioactive peptide on the hearts of two Orthopteran insects, and a Frank-Starling-like mechanism**.** *Insect Biotech Conference***.** St. Catherines, Canada. June 2011.

da Silva R & AB Lange. Evidence of a central pattern generator regulating spermathecal muscle activity in *Locusta migratoria* and its coordination with oviposition. *Insect Biotech Conference*. St. Catherines, Canada. June 2010.

da Silva R & AB Lange. The neural control of muscular activity of the spermatheca in the migratory locust, *Locusta migratoria*. *Insect Biotech Conference*. St. Catherines, Canada. June 2009; *Canadian Society of Zoologists*. Toronto, Canada. May 2009.

da Silva R & AB Lange. The role of crustacean cardioactive peptide on cardiac function in the African migratory locust, *Locusta migratoria*. *Graduate Research Symposium Poster Night*. Mississauga, Canada. April 2009.

da Silva R & AB Lange. Sensory cells associated with the spermatheca of *Locusta migratoria*. *Insect Biotech Conference*. St. Catherines, Canada. June 2008.

da Silva R & AB Lange. Evidence of the association of tyramine with the spermatheca of the migratory locust. *Insect Biotech Conference*. St. Catherines, Canada. June 2007; *Canadian Society of Zoologists*. Montreal, Canada. May 2007.

da Silva R & AB Lange. The association of neurochemicals with the spermatheca of *Locusta migratoria***.** *Insect Biotech Conference*. St. Catherines, Canada. June 2006.

da Silva R & AB Lange. The association of crustacean cardioactive peptide with the spermatheca of the African migratory locust, *Locusta migratoria*. Poster presented at: *Canadian Society of Zoologists*. Kingston, Canada. May 2005; *Insect Biotech Canada*. St. Catherines, Canada. June 2005.

ii. Not peer reviewed: *Not applicable*

16. Patents, Inventions, Copyrights

Not applicable

17. Administrative Responsibilities (2013-present)

Departmental

2019-present **Associate Chair, Undergraduate Studies**

2019-present **Member,** Appointment and Advancements Committee

2019-present **Chair,** Biology Undergraduate Curriculum Steering Committee (BUGS)

2017-present **Member,** Biology Undergraduate Curriculum Steering Committee (BUGS)

2016-2019 **School Council Member**, School of Interdisciplinary Science

2014-present **Co-coordinator** of the ALLURE centre

2015-present **Co-coordinator** of the Undergraduate Cell Biology Laboratory

2013-present **Member,** BIO1A03 Blended Learning Committee

2013-present **Attendance and Participation** at:

- Fall Previews I & II (Volunteer in labs and also give Life Sciences Gateway Talk)
- Level 1 & 2 info nights
- Molecular Biology and Genetics Program Welcome Night
- McMaster Biology Society Experiential Learning and Thesis Information Night
- Ontario University Fair
- Faculty of Science Level II Programs Fair

2014-2018 **Member and Faculty Advisor,** Biology Grad Research Day Committee

2017 **Member,** committee to coordinate and launch the Higher Education Quality Council of Ontario (HEQCO) Essential Adult Skills Initiative (EASI) project in the School of Interdisciplinary Science at McMaster University

2017 **Member,** *Ad hoc* School of Interdisciplinary Science committee to discuss Level I Life Sciences Gateway

2017 **Member,** committee for the hiring of Instructional Assistant in the School of Interdisciplinary Science

2017 **Member,** committee for the hiring of Undergraduate Coordinators in the Department of Biology

2016-2017 **Program Coordinator,** Life Sciences Program; School of Interdisciplinary Science

2016-2017 **Executive Council Member**, School of Interdisciplinary Science

2016-2017 **Member,** Undergraduate Curriculum and Policy Committee, School of Interdisciplinary Science

2014-2015 **Committee Member** for development of Undergraduate Cell Biology Laboratory

2013-2014 **Narrator for BIO1A03** online Blended Learning modules

Faculty of Science

2019-present **Member,** Academic Planning and Policy Committee (APPC)

2018-2019 **Member of Ad Hoc** committee that created Blended Learning Ownership and Authorship within the Faculty of Science, in addition to Commercialization Agreements

2014-2018 **Faculty Member**, McMaster Science Society Academic Science Fund/Student Initiative Fund Committee

2014-2016 **Faculty Mentor,** Science in Hamilton Networking initiative

2013-present **Member and Faculty Mentor,** McMaster Women in Science and Engineering (WISE)

2015-2017 **Member** of Dean's working group to design and build new Living Systems laboratory for the new School of Interdisciplinary Science (SIS) at McMaster University

2015-2017 **Faculty Advisor,** McMaster Genetically Engineered Machines Team (mGEM)

2015-2017 **Faculty Organizer and Workshop Presente**r, the McMaster Mentoring Action Plan (MMAP)

2014-2017 **Member** of Faculty Team coordinating, preparing and presenting engaging recruitment

talks on behalf of the Department of Biology and Life Sciences program for new Science 1A03 course

2015 **Narrator for Electronic Journal Planner** (Narrated all scripts to be used on behalf of all departments in Electronic Journey Planner across the Faculty of Science at McMaster) Collaboration with Associate Dean's Office

2014 **Member,** Level 1 Review Committee (with office of the Associate Dean)

2014 **Member,** Physics 1st Year Advisory Committee

2014 **Poster Judge,** CREST Conference (A WISE event)

University

2019-present **Vice-Chair,** Undergraduate Council

2019-present **Member,** Quality Assurance Council

2019-present **Member,** Classroom Renovation Committee

2019- present **Chair and Member,** Ad Hoc Deferred Examination Committee

2019-present **Member,** Curriculum and Admissions Committee

2018-present **Faculty of Science Representative,** McMaster University Undergraduate Council

Administrative Responsibilities-University of Toronto (2006-2014)

2012-2014 **UTM Alumni Association Board Member**

2011 **Collaboration** with the UTM Office of Advancement
-member of the UTM Choir that performed for the recent flash mob surprise for Mayor Hazel McCallion (http://www.youtube.com/watch?v=Bz5ynXAXRMM)

2010 **Co-Director and Public Relations** for the UTM Choir

2009-2011 **Chair** of Quality Services to Students Council at UTM

2009-2011 **Committee member and presenter** for the Graduate Student Mentoring program in the Department of Biology at UTM

2009-2011 **Vice-Chair**, Erindale College Council at UTM

2009-2011 **Let's Talk Science Volunteer** – science outreach for elementary/secondary schools

2009-2010 **Graduate Student Representative** for the Academic Affairs Committee at UTM

2008 **Graduate student representative** for search of UTM Chief Administrative Officer

2008 **Search Committee Member** for Plant Physiologist faculty member for the Department of Biology at UTM

2008-2010 **Graduate student representative** to the UTM Computing Committee

2007-2008 **UTM Representative** of the University of Toronto Cell and Systems Biology Graduate Union

2007 **Judge,** 29th Annual Undergraduate Research Symposium

2006- 2010 **Vice-President** and **Co-President** of the University of Toronto Mississauga Association of Graduate Students

2006-2010 **Graduate Student Representative** for the Local Animal Care Committee at UTM

2006-2010 **Graduate student representative** on the Advisory Committee to the UTM Library

2006-2010 **Member** of the UTMAGS Parking and Transportation Committee

2006-2010 **Graduate student representative** to the Erindale College Council at UTM Biology

2006-2008 **Graduate Student Representative** for UTM Department of Biology Curriculum Committee

2006-2007 **Search Committee Member** for Theoretical Biology faculty member for the Department of Biology at UTM

2006 **Graduate Student Representative**, Department of Biology, UTM

18. Other Responsibilities

2019-present	**Lead of Ontario Biology Day 2020 Steering Committee**
2018-present	**Faculty Member on National Biology Curriculum Task Force** for the Canadian Council of Undergraduate Biology Chairs
2014-present	**Faculty Advisor** for the Macmillan Publishing (How Life Works Textbook)
2015-2016	**Science Outreach- Arthropods on Display** **-**Cootes Paradise Elementary School -Hamilton Public Library, Sherwood Branch
2014-2016	**Co-organizer** of the Annual McMaster Online and Blended Learning Symposium
2014-2015	**Faculty Panelist** for McMaster Biology Society Open Forum
2014	**Workshop Presenter** for TEDx at McMaster University Workshop *Topic:* "The Next Generation Classroom"
2014	**Judge** for the Symposium
2014	**Presentation and Panelist** on research and project opportunities at McMaster University at the Students Advancing Brain Cancer Research (SABCR) Research Info Night (together with Dr. Kim Dej)