

**Muscle Health Research Centre (MHRC)
Annual Report
2017-18**

1. Contact Information

Director:	David A. Hood
Admin Contact:	Avi Erlich
Address:	302 Farquharson
Tel:	Ext 66640 or 77832
E-Mail:	dhood@yorku.ca or mhrc@yorku.ca
Website:	http://mhrc.info.yorku.ca

2. Charter Dates

July 1, 2008, re-charted in 2014.

3. Mandate – 150 words maximum

The MHRC is an organized research unit within the Faculty of Health dedicated to Biomedical Sciences. Its mandate is to provide a centralized and focused research emphasis on the importance of “muscle health” for the overall health and well-being of Canadians. The MHRC consists of a strong cohort of well-funded and highly productive scholars (including two Canada Research Chairs) and graduate students from the Faculty of Health and the Faculty of Science. The vision statement of the MHRC is “*to be Canada’s leading research centre for the study of muscle health and disease*”. We are achieving this through 1) innovative research, 2) the education of qualified trainees, and 3) the translation of our findings for the benefit of all Canadians.

4. Annual Activities in Fulfilling Mandate – 750 words maximum

The MHRC continues to hold its educational activities every year, consistent with the goal of uniting faculty and trainees in the areas of muscle and heart health, with collaboration and interaction in mind. Our programs provide a platform that continues to increase the visibility of York University, and the MHRC, in Canada and around the world. Our accomplishments are listed in Appendix 2, including the funding obtained, awards received and most significant publications in peer-reviewed journals. This appendix contains an abbreviated version of the vast list of accomplishments of our faculty members (a complete list is provided on the MHRC website). It is clear from this Appendix that the MHRC is fulfilling its mandate in promoting muscle / heart research for the health and well-being of Canadians. We continue to be successful at obtaining

NSERC, CIHR, Heart and Stroke Foundation and Canadian Diabetes Association research funding, and at publishing our findings.

- a) Funding proposals: Several collaborations exist among MHRC faculty members, and among faculty at other institutions. These include MitoNET, a Canada-wide initiative to create a Network centre of Excellence, a Swedish Research Council for Sport Science Grant, and an NSERC RTI proposal that were funded.
- b) Events organized: We normally hold 3 types of events throughout the year:
 - 1) Colloquia, featuring internal speakers discussing their work in an informal interactive research presentation. Normally this involves 3 graduate students who presented their research, or it highlights the work of new faculty members. This year we were unable to schedule this event, but we have one planned for early Fall 2018.
 - 2) Seminars, in which external speakers from other Universities were invited to present their work and to interact with faculty members and graduate students. This year we had 7 external speakers from the Universities of Utah, Pennsylvania, Sherbrooke, as well as Ohio State University, Florida State University, Dalhousie University and Virginia Tech University. The speaker from Florida State was an MHRC student-organized Seminar;
 - 3) The 8th Annual Muscle Health Awareness Day (MHAD), which attracted 8 external speakers, 23 other faculty members and 93 students. A total of 50 posters were presented by trainees (total registration: 116 people).
- c) Knowledge Mobilization / Outreach: All MHRC faculty members are involved in promoting knowledge mobilization of their research via the MHRC website, and MHRC social media outlets (Twitter and Facebook). Newly published papers-of-the-month are summarized in easy to read language for public dissemination. In addition, many members have had their work featured in Y-file, and some members spend considerable time promoting muscle health, metabolism and diabetes education to the public. Several MHRC members have had media interviews in the past year to promote muscle health in their field;
- d) Mentorship: MHRC faculty members are extremely active in the training and development of graduate students, undergraduate students, and post-doctoral fellows. One of the reasons that MHRC members are so successful individually with NSERC is that we are very active in the training of Highly Qualified Personnel (HQP), a major criterion for success with NSERC. MHRC faculty members directly mentored >100 trainees over the past year;
- e) Continuing Education: In collaboration with Faculty of Health staff involved in the Health Leadership and Learning network (HLLN), we have established the course curriculum to offer our Advanced Certificate in Exercise and Muscle Health for recent graduates or Allied Health professionals. We are now endeavouring to move some of these courses online.
- f) Other leadership activities: The MHRC sponsored two \$1000 MHRC Student Fellowships directed against the Graduate Student's fees;
- g) Industry partners: The MHRC has developed relationships with industry on several fronts, including Aurora Scientific, a manufacturing company for muscle testing equipment (Hood), Zucara Therapeutics (Riddell) and Stealth Biotechnologies (Perry), both drug development companies.
- h) Student-based activities: The MHRC continues to significantly involve our graduate student and post-doctoral trainees in our activities. The MHRC Student Committee provides input into our programming and direction, particularly with regard to student interests in the MHRC Seminars and the Muscle Health Awareness Day program. Every year we have a student-invited Seminar speaker. Every two years, the Committee organizes a "Career Day", featuring guest speakers who were

former graduate students and who now have careers in a wide variety of fields (industry, academia, medicine etc.). This event will take place again in 2018-19.

5. Challenges and Areas for Improvement – 500 words maximum

We have two major challenges, and both are related to funding:

- a) Funding for large scale collaborative initiatives related to 1) student training and 2) infrastructure. CREATE and CFI applications have been written, but have not yet been successful. Re-formulations of these initiatives are required moving forward;
- b) Funding of the MHRC itself, either through donor contributions, industry support, or Continuing Education initiatives. Industry support may be forthcoming if the CFI grant is successful. Continuing Education using on-line courses is currently in development, and the curriculum is set. The pursuit of donors is in the hands of the Faculty Development Office, and it is difficult to gauge how much of a priority is being placed in seeking funds for the MHRC.

6. PIER Responses: Update on selected recommendations listed in Appendix A of PIER, and how the MHRC has addressed the recommendations now and in the future.

Selected and applicable PIER Responses of the Muscle Health Research Centre (MHRC)		
	Actions	MHRC Actions
1. Create opportunities and spaces to promote interactive research engagement that foster collaboration and interdisciplinarity	<p>Enhance emphasis on collaborative research in collegial discussion and strategic research planning.</p> <p>Promote the organization of symposia to foster interdisciplinary research</p> <p>Review and enhance spaces that promote informal faculty and research trainee engagement including the promotion of shared work environments and integration of ORUs within Faculty spaces.</p>	<p>Few general member MHC meetings are held, but many collaboration grants and papers are written</p> <p>6 Seminars featuring guest speakers; Muscle Health Awareness Day (MHAD) held yearly</p> <p>Facilitated with Farquharson renovations completed in Fall 2018; the new 3rd floor will be MHRC space</p>
2. Promote and capture a multiplicity of research outputs with an emphasis on impact	<p>Encourage non-traditional research outputs (web-based, film, social media etc.)</p> <p>Emphasize research impact, mentoring and supporting colleagues to achieve the high possible impact venues for their scholarly outputs.</p>	<p>The faculty members in this ORU use traditional research outputs as indicators of success: grants/funding, publications, HQP trainees, invited seminars, awards</p> <p>All members are aware of this</p>

	Promote and value collaborative research and collaborative research outputs to decrease York's overall reliance on single authorship	The MHRC promotes collaborative research grant writing and publications; evident in the Annual Report
3. Build research intensity in the hiring, tenure and promotion of regular full-time faculty.	Complement planning to enhance focus on the alignment of professorial stream hires with the research needs and objectives of the hiring unit and Faculty;	Done yearly, we have added 2 new members to the MHRC this past year (Sweeney, Bigard)
4. Increase and strengthen York's research based graduate population and becoming a destination of choice for postdoctoral training.	<p>Increase the efficiency and effectiveness of graduate student recruitment to York through enhancing internal processes and external outreach</p> <p>Continue growth in professional development supports for graduate students and post-doctoral fellows, including best practice for postdoctoral fellow supervision</p> <p>Encourage and support applications to Increase the percentage of externally funded postdoctoral fellows</p> <p>Continue the development of supports for postdoctoral fellows in all areas</p>	<p>The MHRC faculty members train >100 HQP yearly. Our activities are disseminated through social media and research journals and the website</p> <p>The MHRC has yearly programs (Career Day) in place and strong supervisory skills</p> <p>Always. This is visible on the MHRC website</p> <p>The MHRC supports PDFs by providing space and research funding (3-5 per year)</p>
5. Grow undergraduate participation in research	Increase the number of research opportunities for undergraduates. Includes credit opportunities and non-credit experiential learning opportunities	The MHRC has many UG research students yearly (30-40), during the FW semesters and in the Summer
6. Develop and employ general and specific measures to monitor research progress	<p>Make data on both traditional and nontraditional research outputs broadly available</p> <p>Develop research outputs data analyst capacity that also serves as an interface for York with public and private research data aggregators that influence external university rankings.</p> <p>Units, programs, areas of focus and ORUs to develop relevant specific and externally comparable measures of research, scholarly and</p>	<p>Yes</p> <p>MHRC research outputs are easy to quantify as publications and grant funding</p> <p>All contained within the Annual Report</p>

	associated creative outputs	
7. Enhance the development and implementation of research infrastructure	Develop and report on service level expectations for the implementation of research infrastructure for new hires	The MHRC members actively participate in infrastructure grant and training grant initiatives
8. Develop York's Innovation Landscape, supporting partnerships and translating research into action	Development of research infrastructure capital plan as part of overall university capital plan	MHRC members interact with Innovation York where appropriate. We have an established relationship with Cheryl Giblon.
9. Foster the internationalization of research	Promote enhanced participation of York faculty in international and multinational research activities Increase international graduate student and postdoctoral fellow presence at York	MHRC members actively participate in international collaborations and symposia, and have added X. Bigard as an Adjunct member (from France) MHRC members invite international trainees and faculty members for visits and collaborations
10. Develop Markham as a research-intensive campus.	Include research and innovation at the forefront of Markham campus planning and implementation	Where appropriate, interactions with the Markham campus will take place. The Executive Director, Angelo Belcastro, is an MHRC member
11. Research as a driver and enabler for future York initiatives.	Support ongoing development and growth of research activities and infrastructure commensurate with other research intensive universities. Building relationships with regional hospitals, health agencies and community health organizations to include building support of the Medical School ambition	Always ongoing within the MHRC Yes, this is continuously ongoing with Westlake, Sunnybrook and St. Michael's, for example

7. Financial Position

The attached Excel spreadsheet provides the 3 year rolling budget and line-by-line explanation. At the moment, there are no research grants or contracts that are administered by the MHRC. The Faculty of Health has made a commitment to provide supportive funding for the Centre for the next 3 years. The Faculty supports the MHRC's efforts to achieve self-sufficiency and attract donors, and cash contributions are provisionally committed if this is needed to balance the budget. The Faculty also funds the Director's course release (approximately \$20k/year). The MHRC continues to investigate the possibility of acquiring financial support through other initiatives, such as Continuing Education programs (see above) and industry or granting agency contract overhead contributions.

8. Space Utilization

1. Office Space

Room #	Name of Occupant	Occupant Affiliation ¹	Type of Workspace ²	Length and frequency of Occupancy ³	Notes ⁴
307A Farq	Avi Erlich	Centre Coordinator	Office / Meeting Space	5+ days/week, since 2009	See below
This is Hood Lab space in the interim until the Farquharson renovations are complete at the end of 2018. An agreement was in place with the Faculty of Health for use of this room. This room is used for MHRC Executive Committee and Student Committee meetings. It is available for all MHRC Faculty members to use, and is booked through the MHRC Coordinator.					

2. Shared space/equipment

Room # ⁵	Type of Space ⁶	Access ⁷	Length and frequency of Occupancy ⁸	Requires booking? If so, who is responsible for booking the space/equipment? ⁹	Notes ¹⁰
204 Farq	Lab	Access using a key to authorized individuals	7 Days/week, since 2017	Yes, done through MHRC Coordinator	See below
043 Farq	Lab and vivarium	As above	As above	As above	See below
Room 204 contains some shared equipment that all MHRC Faculty members can use. An agreement is in place with the Faculty of Health. This space is temporary until renovations are completed. Room 043 is vivarium space monitored by the MHRC containing anesthesia equipment and a surgical suite. An agreement is in place with the VPRIs office regarding this space.					

9. Objectives for Upcoming Year (e.g. events, membership, grants, space needs) - 750 words maximum

a) Funding proposals anticipated for submission by April 30, 2019:

With VPRI approval, we could re-formulate and re-submit CFI and CREATE proposals for infrastructure and HQP training, respectively. We always organize submissions for group infrastructure grants from using the NSERC RTI opportunity on a yearly basis. Individual faculty members always submit NSERC Discovery and CIHR or HSF grant renewals;

b) Conferences, workshops or other events:

We organize MHAD every year, as described above. Every second year, we host a Career Day for MHRC trainees. The next one will be held in Spring 2019. We also organize occasional Industry Workshops for the demonstration of sophisticated equipment, with the intent of potential purchase. We are currently planning a submission to host a major international meeting in 2021; the International Biochemistry of Exercise Conference (IBEC). Applications

to host this meeting are due on June 30, 2018, with a presentation of the bid in Beijing, China in October 2018. We believe that our increasing reputation as a world-renowned centre for Muscle Health, along with Faculty of Health and VPRI support, will convince the IBEC Selection Committee that the MHRC can host a first class, high level conference that will certainly bring excellent visibility to York University in this field.

c) Knowledge mobilization and educational initiatives:

We will continue to develop Continuing Education courses, in the form of the Advanced Certificate in Exercise and Muscle Health (3 on-line courses) for Kinesiology graduates and graduate students, for knowledge dissemination and for revenue to support the MHRC. We will also consider the development of a “Muscle Health Education Day” to increase the exposure of the MHRC to the public for educational purposes, as well as to encourage the involvement of potential donors. One of the challenges of this initiative is the lack of direct relationship of most of our MHRC research to clinical populations. We continue to update the Website and increase our social media exposure, via Twitter and Facebook. In addition, we will continue to develop student-led initiatives and encourage and advertise the enrollment of graduate students in FGS, Mitacs and Innovation York Seminars / Workshops to promote educational broadening for MHRC PhD students.

d) Visitors:

In 2018-19 we anticipate having 6 Invited Guests for Seminars, one Student Colloquium featuring 3 graduate student presentations, and one Career Day, involving 8-9 invited guests from industry, non-profit organizations, colleges, research institutes etc.

e) Other:

- Interact with our Development office within the University as needed to promote outreach and the visibility of the MHRC among members of the public, in an effort to seek interested financial contributions from potential benefactors.
- Continue to develop more relationships with industry to initiate contractual agreements which will bring in revenue for the MHRC. Discussions with colleagues in Innovation York will help us with this;
- Initiate more industry workshops, in concert with yearly group applications for NSERC-RTI as well as the CFI application.
- Develop more collaborations between laboratories within the MHRC as well as more educational initiatives for trainees, as described above.

10. Other relevant items the Director wishes to include in the annual report - 250 words maximum

No additional comments

11. Appendix 1 – Membership and Governance

Active members (York faculty): 21; a complete list of active and adjunct members of the MHRC and their departmental affiliations is provided below.

Other members: Adjunct faculty members: 6; Graduate and UG student members (York): 90; Graduate and UG student members (non-York, other Universities): 50

Executive Committee members: Drs. David Hood (Director), Rolando Ceddia, Mike Connor, Mike Riddell, Peter Backx, and Ms. Meghan Hughes (Graduate Student Member)

Faculty Member	Rank	Research Area	Office Number/ E-Mail	Office Location
School of Kinesiology and Health Science				
Hood, David	Professor, Canada Research Chair, Director of the MHRC	Molecular basis of Mitochondrial Biogenesis in health and disease	dhood@yorku.ca (416)736-2100 x 66640	Farquharson Building, 302
Abdul-Sater, Ali	Assistant Professor	Exercise and immunology / inflammation	aasater@yorku.ca (416)736-2100 x 77226	Norman Bethune College, 341
Adegoke, Olasunkanmi	Associate Professor	Protein and amino acid nutrition and metabolism	oadegoke@yorku.ca (416)736-2100 x 20887	Norman Bethune College, 362
Belcastro, Angelo	Professor, Chair, School of Kinesiology and Health Science	Muscle injury and damage in health and disease	anelcas@yorku.ca (416)736-2100 x 21088	Norman Bethune College, 333B
Biro, Olivier	Associate Professor	Vascular plasticity in striated muscle (angiogenesis vs. capillary regression)	birot@yorku.ca (416)736-2100 x 44043	Norman Bethune College, 353
Ceddia, Rolando	Associate Professor	Glucose and fat metabolism in muscle and adipose tissue	roceddia@yorku.ca (416)736-2100 x 77204	Lumbers Building, 225A
Connor, Michael	Associate Professor	Muscle Development and Cancer	mconnor@yorku.ca (416)736-2100 x 77206	Life Sciences Building, 423B
Drake, Janessa	Associate Professor	Biomechanics of the spine	jdrake@yorku.ca 416-736-2100 Ext. 33568	Sherman Health Science Research Centre, 2030
Edgell, Heather	Assistant Professor	Cardiovascular disease in women	edgell@yorku.ca (416) 736-2100 x 22927	Norman Bethune College, 355
Gage, William	Associate Professor, Associate Vice-President, Teaching and Learning	Biomechanics of postural control and of joint stability	whgage@yorku.ca (416)736-2100 x 33027 (416)736-2100 x 20774	Sherman Health Science Research Centre, 2022 Kaneff Tower, 906
Haas, Tara	Professor	Angiogenesis in Muscle	thaas@yorku.ca (416)736-2100 x 77313	Life Sciences Building, 427A
Hamadeh, Mazen	Associate Professor	Human Nutrition and Exercise Physiology, Diabetes and ALS	hamadeh@yorku.ca (416)736-2100 x 33552	Norman Bethune College, 365

YORK UNIVERSITY
OFFICE OF THE VICE-PRESIDENT RESEARCH & INNOVATION

	Master of Stong College		(416)736-2100 x 66176	Stong College, 314
Hynes, Loriann	Assistant Professor & Athletic Therapy Coordinator	Sports-related injuries and rehabilitation	lyhnes@yorku.ca (416)736-2100 x 22734	Stong College, 326
Kuk, Jennifer	Associate Professor	Obesity, CVD, Type 2 diabetes and exercise interventions	jennkuk@yorku.ca (416)736-2100 x 20080	Sherman Health Science Research Centre, 2002
Perry, Christopher	Associate Professor	Redox Metabolism, Skeletal Muscle, Diet and Exercise	cperry@yorku.ca (416)736-2100 x33232	Norman Bethune College, 344

Riddell, Michael	Professor	Exercise Physiology, Stress and Diabetes Metabolism	mriddell@yorku.ca (416)736-2100 x 40493	Norman Bethune College, 347
Scimè, Anthony	Associate Professor	Stem Cell Biology; Muscle Regeneration; Adipose Differentiation	ascime@yorku.ca (416) 736-2100 x33559	Norman Bethune College, 327C

Department of Biology

Backx, Peter	Professor, Canada Research Chair	Cardiac Muscle Physiology and Disease	pbackx@yorku.ca (416)736-2100 x 33858	Farquharson Building, 135A
McDermott, John	Professor, McGlauchlin Research Chair	Muscle Development	jmcderm@yorku.ca (416)736-2100 x 30344	Life Sciences Building, 427B
Sweeney, Gary	Professor	Cardiac autophagy	gsweeney@yorku.ca (416) 736-2100 x66635	Farquharson Building, 110
Tsushima, Robert	Associate Professor, Chair of the Biology Department	Cardiac Muscle Physiology and Disease	tsushima@yorku.ca (416)736-2100 x 20996	Life Sciences Building, 4 th floor

Adjunct Members

Bigard, Xavier	Professor	Muscle Physiology and exercise	xbigard@gmail.com	Anti-doping agency of France, Paris
Coe, Imogen	Professor, Dean, Faculty of Science	Cardiac Muscle Biochemistry	imogen.coe@ryerson.ca	Ryerson University
Hawke, Thomas	Associate Professor	Muscle Development and Regeneration	hawke@mcmaster.ca	McMaster University
Jacobs, Ira	Dean, Faculty of Physical Education	Muscle Metabolism, Applied Physiology and Pharmacology	ira.jacobs@utoronto.ca	University of Toronto
Laham, Robert	Physician	Muscle physiology	robertlaham@aim.com	York Lanes Appletree Medical Centre
Wharton, Sean	Physician	Obesity and exercise	wharton.sean@gmail.com	Wharton Medical Clinic

MHRC Coordinator

Avi Erlich	Research Assistant, MSc		mhrc@yorku.ca (416) 736-2100 X 77832	Farquharson Bldg, 307
-------------------	-------------------------	--	--	-----------------------

12. Appendix 2: Additional Information about Progress in Fulfilling Mandate (that does not appear elsewhere in the Report)

A total of 15 visitors were hosted by the MHRC in 2017-18:

Name	Institution	Position	Date of Visit	Purpose of Visit
Dr. Milica Radisic	University of Toronto	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Vladimir Ljubicic	McMaster University	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Michael De Lisio	University of Ottawa	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Chetan Phadke	West Park Healthcare Centre/University of Toronto	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Kei Masani	University of Toronto/UHN	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Kim Connelly	Keenan Research Centre for Biomedical Science, St. Michael's Hospital	Physician	May 26, 2017	MHAD Conference Seminar
Dr. Jefferson Frisbee	University of Western Ontario	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Jonathan Schertzer	McMaster University	Professor	May 26, 2017	MHAD Conference Seminar
Dr. Kristin Stanford	Ohio State University	Professor	Oct 6, 2017	Invited Seminar
Dr. David A. Brown	Virginia Tech University	Professor	Nov 10, 2017	Invited Seminar
Dr. Florian Bentzinger	Université de Sherbrooke	Professor	Nov 24, 2017	Invited Seminar
Dr. Susan Howlett	Dalhousie University	Professor	Jan 12, 2018	Invited Seminar
Dr. Micah Drummond	University of Utah	Professor	Feb 9, 2018	Invited Seminar
Dr. Zoltan Arany	University of Pennsylvania	Professor	March 9, 2018	Invited Seminar
Dr. Bret Goodpaster	Florida Hospital	Professor	March 16, 2018	MHRC Student Committee Invited Speaker

Appendix 2: Five most notable contributions associated with membership in the ORU between May 1, 2017 – April 30, 2018

Abdul-Sater, Ali A.

Exploring the effects of copper-infused fabric on inflammation.

Dates of Approved Project: 04/2018-04/2019 Term: 1 year

Ontario Centres of Excellence (OCE)

Dollars Awarded: \$25,000 total

NSERC - ENGAGE

Dollars Awarded: \$25,000 total

A Molecular Immunology Laboratory to Elucidate the Mechanisms of Immune Regulation Following Exercise.

Dates of Approved Project: 01/2018 - 01/2023 Term: 5 years

Canada Foundation for Innovation - John R. Evans Leaders Fund

Dollars Awarded: \$135,000

\$373,670 total (including matching funds from ORF and in-kind contributions)

Chang YH, Wang KC, Chu KL, Clouthier DL, Tran AT, Torres Perez MS, Zhou AC, **Abdul-Sater AA**, Watts TH. Dichotomous Expression of TNF Superfamily Ligands on Antigen-Presenting Cells Controls Post-priming Anti-viral CD4⁺ T Cell Immunity. *Immunity*. 2017. 47(5):943-958.e9. doi: 10.1016/j.immuni.2017.10.014

Adegoke, Olasunkanmi A. J.

UPLC System for Muscle Research, NSERC RTI, \$143,809, **Co-Applicant**; PI David Hood

Maeda N., Abdullahi A., Beatty B., Dhanani Z., and **Adegoke OAJ**. Depletion of the mRNA translation initiation inhibitor, programmed cell death protein 4 (PDCD4), impairs L6 myotube formation. *Physiol Rep*. 2017. 5(17). pii: e13395. doi: 10.14814/phy2.13395.

Backx, Peter H.

CIHR Operating Grant (Principal Investigator)

Uncovering the mechanism of atrial fibrillation using lessons from intense exercise models of atrial remodeling. \$756,000 Total (\$151,200/year for 5 years), Start April 2017

Zeng Y, Du WW, Wu Y, Yang Z, Awan FM, Li X, Yang W, Zhang C, Yang Q, Yee A, Chen Y, Yang F, Sun H, Huang R, Yee AJ, Li RK, Wu Z, **Backx PH**, Yang BB. A Circular RNA Binds To and Activates AKT Phosphorylation and Nuclear Localization Reducing Apoptosis and Enhancing Cardiac Repair. *Theranostics*. 2017. 7(16):3842-3855. doi: 10.7150/thno.19764.

Lee JH, Protze SI, Laksman Z, **Backx PH**, Keller GM. Cell Stem Cell. Human Pluripotent Stem Cell-Derived Atrial and Ventricular Cardiomyocytes Develop from Distinct Mesoderm Populations. 2017. 21(2):179-194.e4. doi: 10.1016/j.stem.2017.07.003.

Laksman Z, Wauchop M, Lin E, Protze S, Lee J, Yang W, Izaddoustdar F, Shafaattalab S, Gepstein L, Tibbits GF, Keller G, **Backx PH**. Modeling Atrial Fibrillation using Human Embryonic Stem Cell-Derived Atrial Tissue. *Sci Rep*. 2017. 7(1):5268. doi: 10.1038/s41598-017-05652-y.

Birot, Olivier

NSERC Discovery Grant

Investigating the angiogenic role of Murine Double Minute-2 in contractile muscle cells
\$28,000 / year - 5 years

Ceddia, Rolando B.

NSERC Discovery Grant

Regulation of whole-body energy homeostasis, 2016 -2020 (\$160,000)

Sepa-Kishi DM, Katsnelson G, Bikopoulos G, Iqbal A, **Ceddia RB**. Cold acclimation reduces hepatic protein Kinase B and AMP-activated protein kinase phosphorylation and increases gluconeogenesis in Rats. *Physiol Rep*. 2018. 6(5). doi: 10.14814/phy2.13592.

Sepa-Kishi DM, **Ceddia RB**. White and beige adipocytes: are they metabolically distinct? *Horm Mol Biol Clin Investig*. 2018. 33(2). doi: 10.1515/hmbci-2018-0003.

Sepa-Kishi DM, Sotoudeh-Nia Y, Iqbal A, Bikopoulos G, **Ceddia RB**. Cold acclimation causes fiber type-specific responses in glucose and fat metabolism in rat skeletal muscles. *Sci Rep*. 2017. 7(1):15430. doi: 10.1038/s41598-017-15842-3.

Pinho RA, Sepa-Kishi DM, Bikopoulos G, Wu MV, Uthayakumar A, Mohasses A, Hughes MC, Perry CGR, **Ceddia RB**. *Free Radic Biol Med*. 2017. 110:381-389.

Connor, Michael K.

Theriau, C.F. O.S. Sauvé, M.-S. Beaudoin, D.C. Wright and **M.K. Connor**. Proliferative Endocrine Effects of Adipose Tissue from Obese Animals on MCF7 cells are Ameliorated by Resveratrol Supplementation. *PLoS One*. 2017. **12**, e0183897. doi: 10.1371/journal.pone.01838972017.

Theriau, C.F. and **M.K. Connor**. Voluntary Physical Activity Counteracts the Proliferative Tumor Growth Microenvironment Created by Adipose Tissue via High Fat Diet Feeding in Female Rats. *Physiol. Rep*. 2017. 5: e1332. 2017. doi: 10.14814/phy2.13325 2017.

Drake, Janessa D. M.

NSERC Discovery Grant

Thoracic and Lumbar Spine Biomechanics May 2012- Apr 2017, Extension May 2017-Apr 2018
\$29,000/year (Principle Investigator)

NSERC Research Tools & Instruments Grant

Operations and Maintenance Support for Multi-User York MRI Facility

Co-Applicant and Co-Investigator (Principal Investigator and Applicant Dr. J.K.E. Steeves (Psych), Director of York MRI Facility, York University; Other York Co-Applicants: Drs., J.D. Crawford, K.L. Hoffman, S. Rosenbaum, L.E. Sergio, W.D Stevens, G.R. Turner, T. Womelsdorf, \$150,000.

Edgell, Heather

Hazlett C and **Edgell H.** Chemoreflex function and brain blood flow during upright posture in men and women. *Physiol Rep.* 2017. 6(1). Doi: 10.14814/phy2.13571

Nili M, Abidi S, Serna S, Kim S, and **Edgell H.** Influence of sex, menstrual cycle and oral contraceptives on the cerebrovascular response to paced deep breathing. *Clinical Autonomic Research.* 2017. 27(6): 411-415.

Abidi S, Nili M, Serna S, Kim S, Hazlett C, and **Edgell H.** Influence of sex, menstrual cycle and oral contraceptives on cerebrovascular resistance and cardiorespiratory function during Valsalva or standing. *Journal of Applied Physiology.* 2017. 123(2): 375-386.

CFI Infrastructure operating funds (2018) - \$5,000

NSERC Discovery Grant (Continued funding) - \$120,000 over 5 years – Cerebrovascular and ventilatory responses to autonomic reflex stimulation in supine and upright postures in women throughout the menstrual cycle and men.

Gage, William H.

Stone RC, Rakhamilova Z, **Gage WH**, Baker J. Curling for Confidence: Psychophysical Benefits of Curling for Older Adults. *J Aging Phys Act.* 2018. 26(2):267-275. doi: 10.1123/japa.2016-0279.

Kiriella JB, Araujo T, Vergara M, Lopez-Hernandez L, Cameron JI, Herridge M, **Gage WH**, Mathur S Quantitative Evaluation of Muscle Function, Gait, and Postural Control in People Experiencing Critical Illness After Discharge From the Intensive Care Unit.. *Phys Ther.* 2018. 98(1):8-15. doi: 10.1093/ptj/pzx102.

Verniba D, Vescovi JD, Hood DA, **Gage WH.** The analysis of knee joint loading during drop landing from different heights and under different instruction sets in healthy males. *Sports Med Open.* 2017. 3(1):6. doi: 10.1186/s40798-016-0072-x.

Rahimzadeh Khiabani R, Mochizuki G, Ismail F, Boulias C, Phadke CP, **Gage WH.** Impact of Spasticity on Balance Control during Quiet Standing in Persons after Stroke. *Stroke Res Treat.* 2017. 6153714. doi: 10.1155/2017/6153714.

Haas, Tara L.

NSERC Discovery Grant (renewal); \$165,000 total funding (5 years). 2018-2023

“Regulation of angiogenesis in skeletal muscle”

NSERC Discovery Grant (renewal); \$165,000 total funding (5 years). 2013-2018
“Regulation of capillary sprouting and stabilization in skeletal muscle”

CIF (Swedish Research Council for Sport Science) 570000 SEK total funding (~\$146,000 Cdn) (2 years). 2017- 2018
“Red blood cell-derived nitric oxide: Novel regulator of exercise adaptation”
PI – Thomas Gustafsson (Karolinska Inst, Sweden); Co-applicants: T.L. Haas; C. Perry; J. Pernow (Sweden)

Heart and Stroke Research Foundation of Canada \$266,211 total funding (3 years); 2015-2018
“Regulators of angiogenesis in peripheral limb ischemia” PI – Tara Haas; Co-applicants: C. Ellis (UWO) and O. Birot

The superoxide dismutase mimetic tempol does not alleviate glucocorticoid-mediated rarefaction of rat skeletal muscle capillaries. Mandel ER, Dunford EC, Abdifarkosh G, Turnbull PC, Perry CGR, Riddell MC, **Haas TL**. *Physiol Rep*. 2017. 5(10). pii: e13243. doi: 10.14814/phy2.13243.

Hamadeh, Mazen J.

Minor Research Grant, Faculty of Health, York University, \$3,000 (PI).

May 2017 -The influence of vitamin D supplementation on spinal cord endoplasmic reticulum stress and related apoptosis in amyotrophic lateral sclerosis?

Kolahdouzan M, **Hamadeh MJ**. The neuroprotective effects of caffeine in neurodegenerative diseases. *CNS Neurosci Ther* 2017;23:272-290. doi: 10.1111/cns.12684.

Hood, David A.

Canadian Institutes for Health Research (CIHR) Research Grant entitled "Mitophagy and lysosomal biogenesis in aging muscle" (\$722,925). 2018-2023

Chen C.C.W., A.T. Erlich and **D.A. Hood**. Role of Parkin and endurance training on mitochondrial turnover in skeletal muscle. *Skelet. Muscle* 8(1):10, 2018.

Kim, Y., J. M. Memme and **D.A. Hood**. Application of chronic stimulation to study contractile activity-induced rat skeletal muscle phenotypic adaptations. *J. Vis. Exp.*, e56827, 2018.

Erlich A.T., D.M. Brownlee, K. Beyfuss and **D.A. Hood**. Exercise induces TFEB expression and activity in skeletal muscle in a PGC-1 α -dependent manner. *Am J Physiol Cell Physiol*. 314: C62-C72, 2018. An image from this paper was chosen as the "Image of the week" on *AJP-Cell Physiology Social Media* (Oct 20, 2017).

Kim, Y and **D.A.Hood**. Regulation of the autophagy system during chronic contractile activity-induced muscle adaptations. *Physiol Rep*. 5(14):e13307, 2017.

Hynes, Loriann

Miller MB, Macpherson AK, **Hynes LM**. Athletic Therapy Students' Perceptions of High Fidelity Manikin Simulation: A Pilot Study. *Athletic Training Education Journal*, 2016.

Canadian Red Cross First Aid Manual (Head Injury Recognition and Management), *In Press*.
Canadian Red Cross Professional Responder Manual (Head, Spine & Musculoskeletal Injury Recognition & Management), *Final Revisions*.

A Comparison of Techniques in Predicting Brain Blood Flow from the Neck" 2018 National Traumatic Brain Injury Conference (UHN), Toronto Rehabilitation Institute, ON, February 2018 [poster]
Winner: Best Poster Presentation: Sandeep Gill, MSc Student

"A Comparison of Techniques which Measure Brain Blood Flow in Healthy Young Men and Women" 2017 Summer Undergraduate Research Conference, York University, Toronto, ON, August 2017 [oral]. **Second prize winner for oral presentation: Matthew Sem, Undergraduate Student**

"Identifying Factors Affecting Overall Cerebral Blood Flow – A Pilot Study." [poster] 1st Annual MRI Research Day, York University, Toronto, ON, June 2017

Kuk, Jennifer L.

Alkhalidi, B, Kimball, SM, **Kuk JL** and Ardern CI. Metabolically Healthy Obesity, Vitamin D, and All-Cause and Cardiovascular Disease Mortality Risk in NHANES III. (*Clinical Nutrition – In Press*)

Do K, Wharton S, Ardern CI, Brown RE, **Kuk JL**: Does fit fat paradox also apply to those with higher levels of obesity? (*BMC Obesity –2018; 5 (1) DOI: 10.1186/s40608-018-0183-7*).

Brown RE, Randhawa AK, Canning KL, Fung MDT, Jiandani D, Wharton S, **Kuk JL**: Waist Circumference Landmarking and Associated Metabolic Health Risk (*Clinical Obesity – 2018 Feb;8(1):21-29. doi: 10.1111/cob.12231*).

Randhawa AK, Parikh JS, **Kuk JL**: Trends in Medication Use by Body Mass Index and Age between 1988 and 2012 in the United States. *PLoS One*. 2017. 12(9):e0184089. doi: 10.1371/journal.pone.0184089.

Lee S, **Kuk JL**, Boesch C, Arslanian S: Waist circumference is associated with liver fat in black and white adolescents. *Appl Physiol Nutr Metab*. 2017. 42(8):829-833. doi: 10.1139/apnm-2016-0410.

McDermott, John C.

Renewal of McLaughlin Research Chair, Faculty of Science 2017-2022

NSERC Discovery Grant Renewal (awarded April 2017).

Nanda S, Golemi-Kotra D, **McDermott JC**, Dalai AK, Gökalp I, Kozinski JA. N Biotechnol. Fermentative production of butanol: Perspectives on synthetic biology.2017 . 210-221. doi: 10.1016/j.nbt.2017.02.006. Review.

Tobin SW, Hashemi S, Dadson K, Turdi S, Ebrahimian K, Zhao J, Sweeney G, Grigull J, **McDermott JC**. Heart Failure and MEF2 Transcriptome Dynamics in Response to β -Blockers. Sci Rep. 2017. 7(1):4476. doi: 10.1038/s41598-017-04762-x.

Pagiatakis C, Sun D, Tobin SW, Miyake T, **McDermott JC**. TGF β -TAZ/SRF signalling regulates vascular smooth muscle cell differentiation. FEBS J. 2017. 284(11):1644-1656. doi: 10.1111/febs.14070.

Perry, Christopher G. R.

PI, Operating: Determining the efficacy of SBT-20 in Duchenne muscular dystrophy 04/2018.

Stealth Biotherapeutics Inc.

Newton, MA, USA

Total: \$38,565 CAD (\$30,000 USD)

Monaco CMF, Hughes MC, Ramos SV, Varah NE, Lambzerz C, Rahman FA, McGlory C, Tarnopolsky MA, Krause MP, Laham R, Hawke TJ, **Perry CGR**. Altered mitochondrial bioenergetics and ultrastructure in the skeletal muscle of young adults with type 1 diabetes. Diabetologia. 2018. Doi: 10.1007/s00125-00125-0148-4602-6.

Pinho RA, Sepa-Kishi DM, Bikopoulos G, Wu MV, Uthayakumar A, Mohasses A, Hughes MC, **Perry CGR**, Ceddia RB. High-fat diet induces muscle oxidative stress in a fiber type-dependent manner. Free Radical Biol Med. 2017. 110: 381-389.

Mandel ER, Dunford EC, Abdifarkosh G, Turnbull PC, **Perry CGR**, Riddell MC, Haas TL. The superoxide dismutase mimetic Tempol does not alleviate glucocorticoid-mediated rarefaction of rat skeletal muscle capillaries. Physiological Reports. 2017. (10): pii: e13243.

Perry CGR. Mitochondrial adaptations to exercise in human skeletal muscle: a possible role for cristae density as a determinant of muscle fitness. J Physiol.2017. 595(9): 2773-2774. (Invited Perspectives)

Riddell, Michael C.

NSERC Operating Grant: Role of somatostatin signaling on pancreatic islet function and energy homeostasis. \$33,000/year for 5 years. May 1, 2018-April 2023.

JDRF Industry Development and Discovery Program (IDDP). Preclinical drug development of somatostatin receptor 2 antagonists for the prevention of recurrent hypoglycemia in type 1 diabetes (Zucara Therapeutics, PI: Richard Liggins, Co-Investigator: M. Riddell). Call Name: Studies to Preserve or Restore Hypoglycemia Awareness and/or the Counter-Regulatory Response in T1D RFA (IDDP - Industry). Grant Key: 2-IND-2017-515-I-X. Grand Total: \$400,000. July 2017-July 2020.

Mitacs Accelerate Grant (funding to support Julian Aiken as a post-doctoral industry fellow Erin R Mandel-Shorser). \$45,000 Somatostatin signaling and diabetes.

Insulet Corporation. \$44,804.93 USD (2017-2019) OmniPod Type 1 Diabetes Insulin Management for exercise study (OMNI-TIME study).

Pasieka, A.M., and **Riddell, M.C.** (2017, in press). Advances in Exercise, Physical Activity and Diabetes Mellitus. In M. Phillip and T. Battelino (Ed.), Advanced Technology and Treatments in Diabetes 2016 Yearbook. New Rochelle, NY: Mary Ann Liebert Inc.

Scime, Anthony

The role of the Rb family in skeletal muscle adaptation, **NSERC Discovery Grant**, 5 years 125,000

Porras DP, Abbaszadeh M, Bhattacharya D, D'Souza NC, Edjiu NR, Perry CGR, **Scimè A.** p107 Determines a Metabolic Checkpoint Required for Adipocyte Lineage Fates. *Stem Cells*. 2017. 35(5):1378-1391. doi: 10.1002/stem.2576.

Sweeney, Gary

CIHR Project
Cardioprotective effects of adiponectin
5 years **\$661,725**

Sung HK, Chan YK, Han M, Jahng JWS, Song E, Danielson E, Berger T, Mak TW, **Sweeney G.** Lipocalin-2 (NGAL) Attenuates Autophagy to Exacerbate Cardiac Apoptosis Induced by Myocardial Ischemia. *J Cell Physiol*. 2017. 232(8):2125-2134.

Song E, Jahng JW, Chong LP, Sung HK, Han M, Luo C, Wu D, Boo S, Hinz B, Cooper MA, Robertson AA, Berger T, Mak TW, George I, Schulze PC, Wang Y, Xu A, **Sweeney G.** Lipocalin-2 induces NLRP3 inflammasome activation via HMGB1 induced TLR4 signaling in heart tissue of mice under pressure overload challenge. *Am J Transl Res*. 2017. 15;9(6):2723-2735.

Dang TQ, Yoon N, Chasiotis H, Dunford EC, Feng Q, He P, Riddell MC, Kelly SP, **Sweeney G.** Transendothelial movement of adiponectin is restricted by glucocorticoids. *J Endocrinol*. 2017. 234(2):101-114

Song E, Ramos SV, Huang X, Liu Y, Botta A, Sung HK, Turnbull PC, Wheeler MB, Berger T, Wilson DJ, Perry CGR, Mak TW, **Sweeney G.** Holo-lipocalin-2-derived siderophores increase mitochondrial ROS and impair oxidative phosphorylation in rat cardiomyocytes. *Proc Natl Acad Sci U S A*. 2018. 115(7):1576-1581

Tsushima, Robert

Bayer JD, Aschar Sobbi R, Wauchop M, Spears D, Gollob M, Vigmond E, **Tsushima RG**, Backx P, Liu J, Chauhan V. Complex interactions in a novel SCN5A compound mutation associated with long QT and Brugada syndrome: Implications for Na⁺ channel blocking pharmacotherapy for de novo conduction disease. PLoS. One.2018 in press.

Appendix 2: Awards

Hynes, Loriann

Distinguished Athletic Therapy Educator Award: Canadian Athletic Therapists Association, 2018

UHN Traumatic Brain Injury Conference: Winner – Best Poster, 2018

Perry, Christopher G. R

PI, Operating: Early Researcher Award, Ministry of Research and Innovation, 02/2018.

Title: Developing novel therapeutics to treat muscle weakness in Duchenne muscular dystrophy.

Total: \$140,000

Dean's Award for Excellence in Research: Early Career, 2017

Faculty of Health, York University

Sweeney, Gary

Established Researcher, YorkU, Science.

Cumulative Financial Statement

ORU: Muscle Health Research Centre							
							157001
				3 Year Rolling Budget			
Account Description	2015-16 Actuals	2016-17 Actuals	2017-18 Actuals	Comments	2018-19	2019-20	2020-21
Revenue:							
Base Allocation from Central			n/a				
VPRI support (CR, stipend, operating)			n/a				
Faculty support			\$41,524.51	Year end allocation to balance. Support in 19-20 and beyond is placeholder; not yet committed	\$ 40,000.00	\$ 40,000.00	\$ 40,000.00
Endowment Revenue			n/a				
Indirect Costs (Overhead)			\$0.00		\$ -	\$ -	\$ -
Support from Grants and Contracts			n/a				
Other Internal Revenue			\$1,500.00	Total internal support for Muscle Health Awareness Day	\$ 1,500.00	\$ 1,500.00	\$ 1,500.00
Other External Revenue			\$6,110.00	External Muscle Health Awareness Day Conference support, including registration fees and sponsorships from external sources	\$ 7,000.00	\$ 7,000.00	\$ 7,000.00
TOTAL REVENUE			\$49,134.51		\$48,500.00	\$48,500.00	\$48,500.00
Expenses:							
Total Faculty Admin. Sal & Ben			\$7,596.19	Director Stipend + Benefits	\$7,308.00	\$7,417.62	\$7,528.88
Total Research Staff Sal & Ben			n/a				
Total Support Staff Sal & Ben			\$22,360.61	Centre Coordinator Salary+ Benefits	\$22,696.02	\$23,036.46	\$23,382.01
Total Other Salaries & Ben			\$5,563.82	Honoraria, housing, food and travels costs for guests/invited speakers and associated costs for their seminar presentations at York University (excluding MHAD guests)	\$ 5,000.00	\$ 5,000.00	\$ 5,000.00
Total Equipment			\$1,734.29	Equipment purchases and machine shop services	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00
Total Other Expense			\$8,715.89	All related MHAD expenses-food, speaker travel, student poster awards, event program and miscellaneous supplies. Annual MHRC Graduate Student Fellowship awards (2 x \$1000) for two graduate students. Future expenses will also include vivaria (043 Farquharson) maintenance-\$2000	\$ 11,000.00	\$ 11,000.00	\$ 11,000.00
Total Travel & Hospitality			\$1,961.78	Travel/housing costs related to MHRC member conference travel	\$ 2,000.00	\$ 2,000.00	\$ 2,000.00
Total Supplies			\$11.29	Office supplies	\$ 50.00	\$ 50.00	\$ 50.00
Total Telephone & Power			\$1,190.64	Telephone costs	\$ 1,200.00	\$ 1,200.00	\$ 1,200.00
TOTAL EXPENSES			\$49,134.51		\$50,254.02	\$50,704.08	\$51,160.89
Total Revenue Less Total Expenses			\$0.00		\$0.00	\$0.00	\$0.00
Carryforward from Previous Year							
Balance (cwfd to next year)							
Notes:							
Actuals must match bottom line in ereports - that is TR-TE, Cwfd and Balance must be the same as in ereports							
A separate spreadsheet for each cost centre (no roll up).							