

**Name of Muscle Health Research Centre (MHRC)
Annual Report
2019 – 2020**

1. Contact Information: Include the following:

Name of Director	
Telephone number	Ext 66640 or 77832
Email address	dhood@yorku.ca or mhrc@yorku.ca
Campus address	302 Farquharson
Administrative contact	Louise Solomon
ORU website	http://mhrc.info.yorku.ca

2. Original and Current Charter Dates:

July 1, 2008, re-charted in 2014.

3. Mandate

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 a York Research Chair) and graduate students from the Faculty of Health and the Faculty of Science. The current 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. As noted below, we have spent considerable time in 2019-20 analyzing and revising the vision and mandate of the MHRC (see **APPENDIX 2** – Additional **Centre-specific** accomplishments). This set of revisions has been submitted to the Dean of the Faculty of Health for approval.

4. 2019-2020 Outstanding Centre-specific Accomplishments

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 1, 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 called 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, and CFI 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.
- 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.
 - 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 4 speakers in total, from the University of Montreal, the University of Florida, York University and the Mayo Clinic, Rochester MN. The Seminar Series was shortened to only 4 speakers because of COVID-19.
 - 3) The 10th Annual Muscle Health Awareness Day (MHAD10), which attracted 8 speakers (1 internal, 7 external), 28 other faculty members and 104 students. A total of 60 posters were presented by trainees (total registration: 140 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: We have established the course curriculum to offer our Advanced Certificate in Exercise and Muscle Health for recent graduates or Allied Health professionals. Time will be required to move some of these courses online, along with support from Faculty of Health staff involved in the Health Leadership and Learning network (HLLN).
- f) Other leadership activities: The MHRC sponsored two \$1000 MHRC Student Fellowships directed against the Graduate Student's fees. This Fellowship is for MSc students in second year who do not have Tri-Council external funding sources;
- 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), Stealth Biotechnologies and F2C Nutrition (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. We look forward to hosting the next Career Day in February, 2021.

5. Challenges and Areas for Improvement

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 in the past but have not yet been successful. We are beginning to re-formulate the plan for CFI funding if the opportunity arises in the near future. In the meantime, we continue to use the NSERC RTI application process to acquire new equipment to support our MHRC Core Facility.
- b) Funding of the MHRC itself, either through donor contributions, industry support, or Continuing Education initiatives. 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 of Health Development Office.

6. Financial Position: The “Financial Position” is attached as Appendix 4.

7. Graduate Diplomas and Non-Degree Activities - Provide a brief list of all current graduate diplomas, courses, non-credit, and/or non-degree activities whether revenue generating and “other” offered by the ORU in the chart below. Be sure to indicate the home Faculty of any credit-assigned courses or diplomas.

List all current activities:

	Activity Type	# Attendees	Affiliation
1.	Advanced Certificate in Exercise and Muscle Health	In development	Kinesiology
2.	MHAD10	140	MHRC
3.	Seminar Speaker’s Series	30-50/seminar	MHRC

Space Utilization

Room #	Name of Occupant	Occupant Affiliation ¹	Type of Workspace ²	Length and Frequency of Occupancy ³	Notes ⁴
332 Farq	Louise Solomon	Coordinator	Office	Feb 18,2020 2.5 days/week	
333 Farq	Dr. David Hood	Director	Office	5d/week	

(a) **Shared Space/Equipment** – fill out the table below indicating the utilization of shared space and equipment within your ORU.

Room # ⁵	Type of Space/Equipment ⁶	Access ⁷	Length and Frequency of Occupancy ⁸	Notes ⁹
043 Farq	Lab, vivarium	MHRC members, key	Unspecified, key access, 5d/week	Shared lab space, agreement in place
320 Farq	Core facility, large shared equipment lab	MHRC members, key	Unspecified, key access, 5d/week	Shared lab space, agreement in place
322 Farq	Exercise and Biopsy Lab	MHRC members, key	Unspecified, key access, 5d/week	Shared lab space, agreement in place
330 Farq	Meeting room	MHRC members, key	Unspecified, key access, 5d/week	Shared meeting room, agreement in place
⁵ If no room number, indicate where it is located.				
⁶ Choose the type of space: meeting room, cubicle, reception, open space, resource centre, supply room, storage, coat closet, kitchen, photocopier room, break room, lab, etc.				
⁷ Choose type of access: open access, key badge, key, etc.				
⁸ Choose unspecified or list a <i>realistic</i> period (starting and ending) regarding how often this room gets used (e.g. 4 days a week, 3 days a week, etc.)				
⁹ Explain if there is an agreement in place and how this room is being utilized.				

8. Objectives for Upcoming Year

- a) Funding proposals anticipated for submission by April 30, 2021:
We will reformulate a CFI Infrastructure proposal if given the opportunity, as we have done in the past. In addition, we always organize submissions for group infrastructure grants from using the NSERC RTI opportunity on a yearly basis. Individual faculty members also regularly 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 Winter 2021. We also organize occasional Industry Workshops for the demonstration of sophisticated equipment, with the intent of potential purchase. We have also successfully won the bid to host the International Biochemistry of Exercise Conference in June, 2021. This truly international event has a 50 year history, and is held only every three years, with recent previous locations in Beijing (2018), Sao Paulo (2015) and Stockholm (2012). The Faculty of Health is fully supportive of this initiative, which will bring visibility and repute to the Faculty and the University as a whole. Organization of this, including website development, is ongoing and well underway.

- 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 are also in discussion with the Kinesiology and Health Science UPD to develop a Certificate in Exercise and Muscle Health for undergraduate students. 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 2020-21 we will be hosting MHAD11 via Zoom with 7 external and 1 internal speaker, along with 50-60 Abstract submissions. Our regular MHRC Seminar series will entertain 6 external speakers, as usual. We will also organize one Trainee Colloquium, featuring (internal) 3 speakers. We also anticipate 2-3 new post-doctoral fellows to be affiliated with the MHRC, from external institutions.
- e) Other (these are ongoing initiatives):
- 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.
 - Continue to participate in NSERC and CIHR workshops to educate fellow York faculty members with the ins-and-outs of writing tri-Council funding applications.

FUNDING PROPOSALS: anticipated for submission by **April 30, 2021** by active members of the ORU

Funding Proposal	Funder	Value	Type (grant, contract, other)	Role of ORU
1. Infrastructure	CFI	TBD	Grant	Write the application, provide the space
2. Infrastructure	NSERC	TBD	Grant	As above
3. Operating	NSERC / CIHR	TBD	Individual Grant	Provide support where possible

PLANNED EVENTS: List conferences, workshops, exhibits or other events to be hosted or organized by **April 30, 2021**, and target audience(s).

	Events (Workshop, Exhibit, Conference, Other)	Target Audience(s)
1.	11 th Muscle Health Awareness Day (MHAD11)	130-150 faculty and trainees
2.	MHRC Seminar Series	30-40/seminar, faculty and trainees
3.	Career Day	50-100, Graduate Students

PLANNED ACTIVITIES: List knowledge mobilization/engagement/outreach/technology transfer activities planned

	Activities (Knowledge Mobilization, Engagement, Outreach, Technology Transfer, Other)
1.	11 th Muscle Health Awareness Day May 2020 – online Via Zoom
2.	MHRC Seminar Speaker’s Series Fall 2020

All specific **visitors** invited or anticipated (visiting faculty or other)– please list

	Visitor	Purpose
1.	Dr. Charlotte Peterson	MHRC Seminar Speaker
2.	Dr. Imed Gallouzi,	MHAD11 speaker
3.	Dr. Jacob Haus	MHAD11 speaker
4.	Dr. Scot Kimball	MHAD11 speaker
5.	Dr. Sunita Mathur	MHAD11 speaker
6.	Dr. Phillip J. Millar	MHAD11 speaker
7.	Dr. Kimberly Dunham-Snary	MHAD11 speaker
8.	Dr. Richard I. Hughson	MHAD11 speaker
9.	At least 5 other speakers will be invited in F/W2020-21, TBD	

APPENDIX 1 – Active Members and Governance

Active Member Name	Faculty	Department
Abdul-Sater, Ali	Faculty of Health	School of Kinesiology and Health Science
Adegoke, Olasunkanmi	Faculty of Health	School of Kinesiology and Health Science
Backx, Peter	Faculty of Science	Department of Biology
Belcastro, Angelo	Faculty of Health	School of Kinesiology and Health Science
Biro, Olivier	Faculty of Health	School of Kinesiology and Health Science
Ceddia, Rolando	Faculty of Health	School of Kinesiology and Health Science
Cheng, Arthur	Faculty of Health	School of Kinesiology and Health Science
Connor, Michael	Faculty of Health	School of Kinesiology and Health Science
Drake, Janessa	Faculty of Health	School of Kinesiology and Health Science
Edgell, Heather	Faculty of Health	School of Kinesiology and Health Science
Gage, William	Faculty of Health	School of Kinesiology and Health Science
Haas, Tara	Faculty of Health	School of Kinesiology and Health Science
Hamadeh, Mazen	Faculty of Health	School of Kinesiology and Health Science
Hood, David	Faculty of Health	School of Kinesiology and Health Science
Hynes, Loriann	Faculty of Health	School of Kinesiology and Health Science
Josse, Andrea	Faculty of Health	School of Kinesiology and Health Science
Kuk, Jennifer	Faculty of Health	School of Kinesiology and Health Science
McDermott, John	Faculty of Science	Department of Biology
Perry, Christopher	Faculty of Health	School of Kinesiology and Health Science
Riddell, Michael	Faculty of Health	School of Kinesiology and Health Science
Roudier, Emilie	Faculty of Health	School of Kinesiology and Health Science
Scimè, Anthony	Faculty of Health	School of Kinesiology and Health Science
Sweeney, Gary	Faculty of Science	Department of Biology
Tsushima, Robert	Faculty of Science	Department of Biology

Other Members: List all other members, designating the ORU’s own categories and criteria for membership (e.g. members- affiliate or associate, student, external or community, non-active).

Other Member Name	Faculty	Department	Membership category
Biggard, Xavier	Medical Director	Union Cycliste Internationale (UCI)	Adjunct
Coe, Imogen	Faculty of Science	Ryerson University	Adjunct
Grace, Sherry	Faculty of Health	York University	Adjunct
Hawke, Thomas	Medicine	McMaster University	Adjunct
Jacobs, Ira	Faculty of Physical Education	University of Toronto	Adjunct
Laham, Robert	Physician	York Lanes Appletree Medical Centre	Adjunct
Wharton, Sean	Physician	Wharton Medical Clinic	Adjunct

Five notable contributions for each active member above

(A full and more complete list of MHRC contributions can be found on the MHRC website, under “Complete Contributions”).

Abdul-Sater, Ali A.

Funding Received:

Canadian Institutes of Health Research (CIHR) – Project Grant

Dissecting The Role Of TRAF1 In Regulating Linear Ubiquitination And The Impact On Inflammatory Diseases.

2019/4 – 2024/4, Total Funding - \$803,250

Arthritis Foundation – Stars Career Development Award

A Mouse Model To Design Therapies Targeting TRAF1 In Rheumatoid Arthritis

2019/1 – 2022/1, Total Funding - \$375,000

Awards:

Bhagirath Singh Early Career Award In Infection And Immunity (\$16,667). Awarded By CIHR For The Top Scoring Project Grant In The Panel Throughout The Competition.

Publications:

Ardavan Jafari[#], David M. Ojcius, Laxmi Yeruva, Christian Schindler and **Ali A. Abdul-Sater***. *Dicer Controls The Activation Of NLRP3 Inflammasomes*. *PLoS One* April 2019 (Accepted)

Adegoke, Olasunkanmi

Publications:

Interactions Of The Super Complexes: When Mtorc1 Meets The Proteasome. Adegoke OAJ, Beatty BE, Kimball SR, Wing SS. *Int J Biochem Cell Biol.* 2019 Dec;117:105638. Review.

Depletion Of Branched-Chain Aminotransferase 2 (BCAT2) Enzyme Impairs Myoblast Survival And Myotube Formation. Dhanani ZN, Mann G, Adegoke OAJ. *Physiol Rep.* 2019 Dec;7(23):e14299. doi: 10.14814/phy2.14299.

Backx, Peter

Publications:

Yimu Zhao, Naimeh Rafatian, Nicole T. Feric, Brian Cox, Roosbeh Aschar-Sobbi, Erika Yan Wang, Praful Aggarwal, Boyang Zhang, Genevieve Conant, Kacey Ronaldson-Bouchard, Aric Pahnke, Stephanie Protze, Jee Hoon Lee, Locke Davenport Huyer, Danica Jekic, Anastasia Wickeler, Hani Naguib, Gordon M. Keller, Gordana Vunjak-Novakovic, Ulrich Broeckel, **Peter H. Backx****, Milica Radisic** A platform for generation of chamber specific cardiac tissues and disease modelling. *Cell* 176(4): 913-927, 2019. ** Co-senior authors

Hughes MC, Ramos SV, Turnbull PC, Edgett BA, Huber JS, Polidovitch N, Schlattner U, **Backx PH**, Simpson JA, Perry CGR. Impairments in left ventricular mitochondrial bioenergetics precede overt cardiac dysfunction and remodelling in Duchenne muscular dystrophy. *J Physiol.* 598(7):1377-1392, 2020.

Wu J, You J, Wang X, Wang S, Huang J, Xie Q, Gong B, Ding Z, Ye Y, Wang C, Kang L, Xu R, Li Y, Chen R, Sun A, Yang X, Jiang H, Yang F, **Backx PH**, Ge J, Zou Y Left ventricular response in the transition from hypertrophy to failure recapitulates distinct roles of Akt, β -arrestin-2, and CaMKII in mice with aortic regurgitation. *Ann Transl Med.* 8(5):219, 2020

Li X, Zheng S, Tan W, Chen H, Li X, Wu J, Luo T, Ren X, Pyle WG, Wang L, **Backx PH**, Huang R, Yang FH. Slit2 Protects Hearts Against Ischemia-Reperfusion Injury by Inhibiting Inflammatory Responses and Maintaining Myofilament Contractile Properties. *Front Physiol.* 11:228, 2020.

Lidington D, Fares JC, Uhl FE, Dinh DD, Kroetsch JT, Sauv e M, Malik FA, Matthes F, Vanherle L, Adel A, Momen A, Zhang H, Aschar-Sobbi R, Foltz WD, Wan H, Sumiyoshi M, Macdonald RL, Husain M, **Backx PH**, Heximer SP, Meissner A, Bolz SS. CFTR Therapeutics Normalize Cerebral Perfusion Deficits in Mouse Models of Heart Failure and Subarachnoid Hemorrhage. *JACC Basic Transl Sci.* 4(8):940-958, 2020.

Birot, Olivier

Publications:

Nwadozi, E., Rudnicki, M., De Ciantis, M., Milkovich, S., Pulbere, A., Roudier, E., **Birot, O.**, Gustafsson, T., Ellis, C. G., & Haas, T. L. (2020). High-Fat Diet Pre-Conditioning Improves Microvascular Remodelling During Regeneration Of Ischaemic Mouse Skeletal Muscle. *Acta Physiologica (Oxford, England)*, 229(1), e13449. <https://doi.org/10.1111/apha.13449>

Di Bacco, V. E., Taherzadeh, M., **Birot, O.**, & Gage, W. H. (2020). The Effects Of Single Versus Multiple Training Sessions On The Motor Learning Of Two Krav Maga Strike Techniques, *In Women. PeerJ*, 8, e8525. <https://doi.org/10.7717/peerj.8525>

Ceddia, Rolando

Publications:

Effting, P. S., Brescianini, S., Sorato, H. R., Fernandes, B. B., Fidelis, G., Silva, P., Silveira, P., Nesi, R. T., **Ceddia, R. B.**, & Pinho, R. A. (2019). Resistance Exercise Modulates Oxidative Stress Parameters and TNF- α Content in the Heart of Mice with Diet-Induced Obesity. *Arquivos Brasileiros de Cardiologia*, 112(5), 545–552. <https://doi.org/10.5935/abc.20190072>

Cheng, Arthur

Funding Received:

NSERC Discovery Grant

Novel Fatigue-Related Mechanisms Driving Post-Exercise Recovery and Skeletal Muscle Adaptations and Dysfunction.

2020-2025, Total funding - \$28,500 per year.

NSERC Discovery (Early Career Researcher Launch Supplement) Amounting To A One-Time 04/2020, Total Funding - \$12,500.

Ontario Research Fund

Investigating The Role Of Intracellular Calcium Dynamics On Skeletal Muscle Function In Aged Muscle. 2/2019, Total - \$150,000

Publications:

Cheng, A.J., Chaillou, T., Kamandulis, S., Subocius, A., Westerblad, H., Brazaitis, M., Venckunas, V. (2020). Carbohydrates Do Not Accelerate Force Recovery After Glycogen- Depleting Followed By High-Intensity Exercise In Humans. *Scandinavian Journal of Medicine & Science In Sports*. DOI:10.1111/sms.13655.

Cheng, A.J., Jude, B., Lanner, J.T. (2020). Intramuscular Mechanisms of Overtraining. *Redox Biology*. DOI:10.1016/j.redox.2020.101480.

Connor, Michael

Publications:

Turnbull, P. C., Dehghani, A. C., Theriau, C. F., **Connor, M. K.**, & Perry, C. (2019). Synergistic Activation of Mitochondrial Metabolism and The Glutathione Redox Couple Protects Hepg2 Hepatocarcinoma Cells From Palmitoylcarnitine-Induced Stress. *American Journal of Physiology. Cell Physiology*, 317(6), C1324–C1329. <https://doi.org/10.1152/ajpcell.00366.2019>

Drake, Janessa D. M.

Funding Received:

Ministry of Labour (MOL): Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD)

Functional implications of dynamic and fixed chairs and keyboard systems on musculoskeletal responses during a prolonged seating exposure.

March 2018- August 2019

\$9,800 (Co-Researcher; Lead Research is my MSc Mario Simone, Co-Researcher is my PhD Heather Johnston)

NSERC Discovery Grant

Thoracic and Lumbar Spine Biomechanics, May 2019- April 2024 (Notified April 2019)

\$40,000/year (\$200,000 total)

Publications:

Schinkel-Ivy, A., & **Drake, J.** (2019). Interaction Between Thoracic Movement and Lumbar Spine Muscle Activation Patterns in Young Adults Asymptomatic for Low Back Pain: A Cross-Sectional Study. *Journal of Manipulative and Physiological Therapeutics*, 42(6), 461–469. <https://doi.org/10.1016/j.jmpt.2018.11.022>

Edgell, Heather

Funding Received:

Canadian Institutes for Health Research (CIHR) Research Grant

Myalgic Encephalomyelitis (ME) Network Catalyst Grant

2019, Total Funding - \$1,400,000 for the creation of a national collaborative network of researchers and knowledge users concerned with chronic fatigue syndrome/ME – Member of the Steering Committee

Publications:

Robertson A, *Papadima I, and **Edgell H** (2020) Sex Differences In The Cerebrovascular Response To Upright Tilt Are Associated With Disparate Autonomic Responses Between Men And Women. Submitted to Scientific Reports

Kirk V, **Edgell H**, *Joshi H, Constantin E, Katz SL, and MacLean JE (2020) Cardiovascular Changes In Children With Obstructive Sleep Apnea And Obesity After Treatment With Non-Invasive Ventilation. *Submitted To Journal Of Clinical Sleep Medicine* JC-20-00174

Nardone M, Guzman J, Harvey P, Floras J, and **Edgell H** (2020) Effect Of A Neck Compression Collar On Cardiorespiratory And Cerebrovascular Function In Postural Orthostatic Tachycardia Syndrome (POTS). *J Appl Physiol* March 12 [EPub ahead of print]

Invited presentations:

Toronto Rumsey Centre – Sex Differences in Cardiac Rehabilitation and Modified Exercise Programming for Women – September 19th, 2019

Gage, William

Publications:

Verniba D, **Gage WH**. (accepted for publication, July 23, 2019). Stepping Threshold with Platform-Translation and Shoulder-pull Perturbation Paradigms. *Journal of Biomechanics*.

Kiriella JB, DiBacco V, Hollands K, **Gage WH**. (accepted for publication, June 20, 2019). Evaluation of the effects of prescribing gait Complexity Using several Fluctuating Timing Tmperatives. *Journal of Motor Behavior*.

Street BD, Gage W. (2019) Younger Total Knee Replacement Patients Do Not Demonstrate Gait Asymmetry for Heel Strike Transient or Knee Joint Moments That Are Observed in Older Patients. *J Appl Biomech*. 35(2):140-148.

Abstracts:

Power CR, Kiriella JB, Drake J, Gage WH. (2019). Adaptability of Human Gait: Effect Of Training With Red Noise Auditory Stimuli On Gait Fluctuation Patterns. *International Society for Posture and Gait Research Biannual Meeting, Edinburgh, United Kingdom*.

Di Bacco VE, KiriellaJB, Hollands KL, Gage WH. (2019). Retention of Entrained Auditory Fractal Patterns During Gait. *International Society for Posture And Gait Research Biannual Meeting, Edinburgh, United Kingdom*.

Haas, Tara

Funding Received:

NSERC New Frontiers Grant

Zero-Gravity 3D Bioprinting of Super-Soft Materials
2019-2021, Total Funding \$250,000

Publications:

Nwadozi, E., Rudnicki, M., & **Haas, T. L.** (2020). Metabolic Coordination of Pericyte Phenotypes: Therapeutic implications. *Frontiers in Cell and Developmental Biology*, 8, 77.

<https://doi.org/10.3389/fcell.2020.00077>

Nwadozi, E., Rudnicki, M., De Ciantis, M., Milkovich, S., Pulbere, A., Roudier, E., Birot, O., Gustafsson, T., Ellis, C. G., & **Haas, T. L.** (2020). High-Fat Diet Pre-Conditioning Improves Microvascular Remodelling During Regeneration of Ischaemic Mouse Skeletal Muscle. *Acta Physiologica (Oxford, England)*, 229(1), e13449. <https://doi.org/10.1111/apha.13449>

Hamadeh, Mazen

Awards:

2020 Nominated for the Dean's Award for Excellence in Service and Engagement Impact (Established Career), Faculty of Health, York University

2019 Golden Key International Honour Society Honourary Member

Hood, David

Funding Received:

Natural Sciences and Engineering Research Council Research Tools and instruments Grant Flow Cytometer for Muscle Health Research, 2020-2021, \$149,600

Awards:

Canadian Association of Graduate Studies Mentorship Award Finalist 2019 (top 5 nationally)

Publications:

Hood, D.A., J.M. Memme, A.N. Oliveira and M. Triolo. Maintenance of Skeletal Muscle Mitochondria in Health, Exercise, and Aging. *Ann. Rev. Physiol.* 81:19-41, 2019.

Memme, J. M., Erlich, A. T., Phukan, G., & **Hood, D. A.** (2019). Exercise and Mitochondrial Health. *The Journal of Physiology*, 10.1113/JP278853. Advance online publication. <https://doi.org/10.1113/JP278853>

Zhang, Y., Oliveira, A. N., & **Hood, D. A.** (2020). The Intersection of Exercise and Aging on Mitochondrial Protein Quality Control. *Experimental Gerontology*, 131, 110824. <https://doi.org/10.1016/j.exger.2019.110824>

Hynes, Loriann

Funding Received:

Maple League of Universities

Maple League Teaching & Learning Centre, Innovative Pedagogies Fund

2019, Total Funding - \$10,000

SSHRC Institutional Grant

SIG Committee, Acadia University

2019, Total Funding - \$2997

Awards Received:

Certified Writing Award: Canadian Athletic Therapists Association, 2020

Publications:

Peisachovich E, Da Silva C, Gal R, Boni M, **Hynes LM**. (March 6, 2020) Exploring the Experiences of Learners Exposed to Simulated Person Methodology with an Athletic Therapy Course. *Cureus* 12(3): e7194. doi:10.7759/cureus.7194

Hurtubise JM, Gorbet DJ, **Hynes LM**, Macpherson AK, Sergio LE. White matter integrity and its Relationship to Cognitive-Motor Integration in Females with and without Post-Concussion Syndrome. *Journal of Neurotrauma*. Ahead of print <http://doi.org/10.1089/neu.2019.6765>

Josse, Andrea

Publications:

Beaudry, K. M., Ludwa, I. A., Thomas, A. M., Ward, W. E., Falk, B., & **Josse, A. R.** (2019). First-Year University Is Associated With Greater Body Weight, Body Composition And Adverse Dietary Changes In Males Than Females. *PloS One*, 14(7), e0218554. <https://doi.org/10.1371/journal.pone.0218554>

Adebero, T., Mckinlay, B. J., Theocharidis, A., Root, Z., **Josse, A. R.**, Klentrou, P., & Falk, B. (2019). Salivary and Serum Concentrations of Cortisol and Testosterone At Rest and in Response to Intense Exercise in Boys Versus Men. *Pediatric Exercise Science*, 1–8. *Advance Online Publication*. <https://doi.org/10.1123/Pes.2019-0091>

Thomas, A. M., Beaudry, K. M., Gammage, K. L., Klentrou, P., & **Josse, A. R.** (2019). Physical Activity, Sport Participation, And Perceived Barriers to Engagement In First-Year Canadian University Students. *Journal of Physical Activity & Health*, 16(6), 437–446. <https://doi.org/10.1123/jpah.2018-0198>

Theocharidis, A., McKinlay, B. J., Vlachopoulos, D., **Josse, A. R.**, Falk, B., & Klentrou, P. (2020). Effects of Post Exercise Protein Supplementation on Markers of Bone Turnover in Adolescent Swimmers. *Journal of The International Society of Sports Nutrition*, 17(1), 20. <https://doi.org/10.1186/s12970-020-00350-z>

Josse, A. R., Ludwa, I. A., Kouvelioti, R., Calleja, M., Falk, B., Ward, W. E., & Klentrou, P. (2020). Dairy Product Intake Decreases Bone Resorption Following A 12-Week Diet And Exercise Intervention In Overweight And Obese Adolescent Girls. *Pediatric Research*, 10.1038/S41390-020-0834-5. *Advance Online Publication*. <https://doi.org/10.1038/S41390-020-0834-5>

Kuk, Jennifer

Publications:

Randhawa AK, Ardern CI, **Kuk JL**: Changes in The Prevalence Of Chronic Conditions Associated With Abdominal Obesity Between 1999-2014 (Clinical Obesity – In Press)

Wharton S, **Kuk JL**, Luszczynski M, Kamran E, **Christensen RAG**: *Liraglutide 3.0mg for the Management of Insufficient Weight Loss or Excessive Weight Regain Post-Bariatric Surgery* (Clinical Obesity – 2019 Aug;9(4):e12323. doi: 10.1111/cob.12323. Epub 2019 Jun 10).

Lee S, Kim Y, **Kuk JL**: What Is The Role of Resistance Exercise In Improving Cardiometabolic Health of Adolescents With Obesity? (Journal of Obesity & Metabolic Syndrome – 2019 Jun;28(2):76-91. Doi: 10.7570/Jomes.2019.28.2.76. Epub 2019 Jun 30. Review)

Kuk JL, Lee S: Sex and Ethnic Differences in The Relationship Between Changes In Anthropometric Measurements And Visceral Fat In Adolescents With Obesity (J Of Pediatrics – 2019 Oct;213:121-127. Doi: 10.1016/J.jpeds.2019.05.052. Epub 2019 Jun 22)

Invited Presentations:

Truth versus Fiction – Causes of Obesity and the Effectiveness of Weight Loss Treatments (York Health Psychology Graduate Diploma Program Seminar Presentation, Sept 30, 2019).

McDermott, John

Publications:

Tripathi, S., Miyake, T., & **McDermott, J. C.** (2019). Smad7:β-catenin complex regulates myogenic gene transcription. *Cell Death & Disease*, 10(6), 387. <https://doi.org/10.1038/s41419-019-1615-0>

Arnò, B., Galli, F., Roostalu, U., Aldeiri, B. M., Miyake, T., Albertini, A., Bragg, L., Prehar, S., **McDermott, J. C.**, Cartwright, E. J., & Cossu, G. (2019). TNAP limits TGF-β-dependent cardiac and skeletal muscle fibrosis by inactivating the SMAD2/3 transcription factors. *Journal Of Cell Science*, 132(15), jcs234948. <https://doi.org/10.1242/jcs.234948>

Öztürk, M., **McDermott, J. C.**, Laeseke, P. F., Nakada, S. Y., Hedican, S. P., Best, S. L., & Kleedehn, M. G. (2019). Management of Indiana pouch stones through a percutaneous approach: A single center experience. *Turkish Journal Of Urology*, 45(5), 366–371. <https://doi.org/10.5152/tud.2019.19049>

Miyake, T., Aziz, A., & **McDermott, J. C.** (2020). Maintenance of the Undifferentiated State in Myogenic Progenitor Cells by TGFβ Signaling is Smad Independent and Requires MEK Activation. *International Journal Of Molecular Sciences*, 21(3), 1057. <https://doi.org/10.3390/ijms21031057>

Perry, Christopher G. R.

Funding Received:

NSERC Discovery Grant: Regulation of mitochondrial bioenergetics in striated muscle
2019-2024, Total Funding - \$200,000

Awards Received:

2020 - President's Emerging Research Leadership Award (PERLA)

Invited Presentations:

Striated muscle mitochondrial bioenergetics in health and disease. *Ontario Exercise Physiology Annual Winter Meeting*, Barrie, ON (Keynote speaker, Feb. 2020)

Publications:

Monaco CMF, **Perry CGR**, Hawke TJ. Alterations In Mitochondrial Functions And Morphology In Muscle And Non-Muscle Tissues In Type 1 Diabetes: Implications For Metabolic Health. *Exp Physiol*. 2020 April; 105(4): 565-570.

Turnbull PC, Hughes, MC, **Perry CGR**. The Fatty Acid Derivative Palmitoylcarnitine Abrogates Colorectal Cancer Cell Survival By Depleting Glutathione. *Am J Physiol: Cell Physiol*. 2019 December 1; 317(6): C1278-1288.(Chosen By Editors: Highlighted For Distinction In Scholarship In *APS Select* (<https://www.physiology.org/apsselect/about>))

Riddell, Michael

Funding Received:

Canadian Glycomics Network (GlycoNet) Strategic Initiatives Grant:

Elucidating the role of somatostatin in dysglycemia in a rodent model of type 2 diabetes.
April 1, 2019 - March 31, 2020 Total Funding - \$69,047.00

Publications:

Zaharieva DP, McGaugh S, Davis EA, **Riddell MC**. Advances in Exercise, Physical Activity, and Diabetes. *Diabetes Technol Ther*. 2020;22(S1):S109–S118. doi:10.1089/dia.2020.2508

Scott SN, Anderson L, Morton JP, Wagenmakers AJM, **Riddell MC**. Carbohydrate Restriction in Type 1 Diabetes: A Realistic Therapy for Improved Glycaemic Control and Athletic Performance? *Nutrients*. 2019 May 7;11(5). pii: E1022. doi:10.3390/nu11051022. Review. *PubMed PMID: 31067747*.

Riddell MC, Pooni R, Fontana FY, Scott SN. Diabetes Technology and Exercise. *Endocrinol Metab Clin North Am*. 2020;49(1):109–125. doi:10.1016/j.ecl.2019.10.011

Roudier, Emilie

Publications :

Lam, B., & **Roudier, E.** (2019). Considering the Role of Murine Double Minute 2 in the Cardiovascular System?. *Frontiers in cell and developmental biology*, 7, 320. <https://doi.org/10.3389/fcell.2019.00320>

Nwadozi, E., Rudnicki, M., De Ciantis, M., Milkovich, S., Pulbere, A., **Roudier, E.**, Birot, O., Gustafsson, T., Ellis, C. G., & Haas, T. L. (2020). High-fat diet pre-conditioning improves microvascular remodelling during regeneration of ischaemic mouse skeletal muscle. *Acta physiologica (Oxford, England)*, 229(1), e13449. <https://doi.org/10.1111/apha.13449>

Scimè, Anthony

Publications:

Bhattacharya, D., & **Scimè, A.** (2019). Metabolic Regulation Of Epithelial To Mesenchymal Transition: Implications For Endocrine Cancer. *Frontiers In Endocrinology*, 10, 773. <https://doi.org/10.3389/fendo.2019.00773>

Sweeney, Gary

Funding:

PI for IDRC Canada-Israel Diabetes Research Team Grant (2019-2022)

Awards:

Tier 1 York Research Chair (2019-2022)

Publications:

Liu, Y., Vu, V., & **Sweeney, G.** (2019). Examining The Potential Of Developing And Implementing Use Of Adiponectin-Targeted Therapeutics For Metabolic And Cardiovascular Diseases. *Frontiers in Endocrinology*, 10, 842. <https://doi.org/10.3389/fendo.2019.00842>

Byrne, N. J., Matsumura, N., Maayah, Z. H., Ferdaoussi, M., Takahara, S., Darwesh, A. M., Levasseur, J. L., Jahng, J., Vos, D., Parajuli, N., El-Kadi, A., Braam, B., Young, M. E., Verma, S., Light, P. E., **Sweeney, G.**, Seubert, J. M., & Dyck, J. (2020). Empagliflozin Blunts Worsening Cardiac Dysfunction Associated With Reduced NLRP3 (Nucleotide-Binding Domain-Like Receptor Protein 3) Inflammasome Activation In Heart Failure. *Circulation. Heart Failure*, 13(1), e006277. <https://doi.org/10.1161/CIRCHEARTFAILURE.119.006277>

Huang, X., Slavkovic, S., Song, E., Botta, A., Mehrazma, B., Lento, C., Johnson, P. E., **Sweeney, G.**, & Wilson, D. J. (2020). A Unique Conformational Distortion Mechanism Drives Lipocalin 2 Binding To Bacterial Siderophores. *ACS Chemical Biology*, 15(1), 234–242. <https://doi.org/10.1021/acscchembio.9b00820>

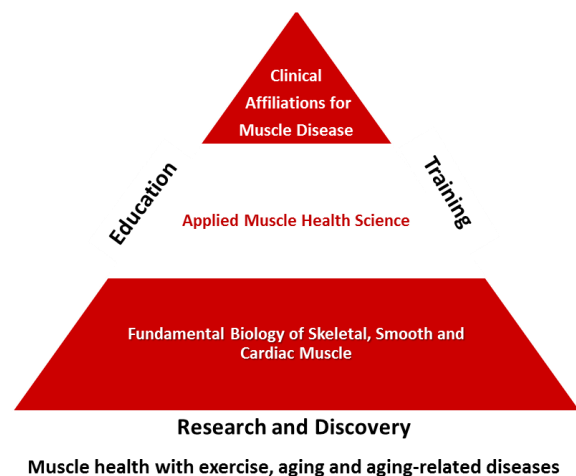
Governance: List members of the Executive Committee:

Executive Committee	
Meeting Date(s): October and November, 2019, and via email	
Member	Affiliation
1. Dr. David Hood	Director, MHRC, Faculty Member, KHS
2. Dr. Michael Riddell	Faculty Member, KHS
3. Dr. Rolando Ceddia	Faculty Member, KHS
4. Dr. Michael Connor	Faculty Member, KHS
5. Dr. Peter Backx	Faculty Member, Biology
6. Dr. Christopher Perry	Faculty Member, KHS
7. Mr. Matthew Triolo	PhD Student, Representative

APPENDIX 2 – Additional Centre-specific accomplishments.

At the direction of the Dean of the Faculty of Health, and in preparation for the next Charter application, the Director of the MHRC was challenged to investigate the possibility of either expanding or contracting the role of the MHRC within the University, in view of limited funding support. To embrace the challenge of forging a greater understanding of muscle health in aging and aging-related diseases, the MHRC Executive as well as senior MHRC faculty members met to discuss a revitalized path forward in which a broadened mandate would be proposed. The goals of this mandate are to increase faculty and trainee engagement in an expanded array of research and education initiatives to expand MHRC prominence in this field both nationally and internationally.

Our revised vision is to be: *“Canada’s leader in exercise and muscle health research, training and education”*, and this vision is encapsulated in a newly revised visual presented below:



We believe that this newly refined vision serves to **integrate** the three main priorities of the MHRC: research, education and training of highly qualified personnel (HQP). In addition, it spans the spectrum from the fundamental biology of muscle health, to its applied and clinical implications for the health of Canadians. This takes full advantage of the breadth of talent within our membership, with the hope of broad engagement in research, education and training of HQP. **A Proposal to grow the MHRC Mandate with an expansion of existing initiatives and plan for new initiatives was developed (Summarized below)** for the next 5

years (2020-25), designed to further research and education in investigating muscle health, and its decline, in aging and aging-related diseases. It includes current programming and activities, as well as new initiatives. **The purpose is to drive innovation in muscle health research and development, as well as trainee education, and to elevate the MHRC toward greater international visibility.** The mandate was re-designed to foster greater involvement of those

dedicated to the vision (above) of the MHRC as the leading research centre in Canada for the study of exercise, muscle health and disease. Initiatives are proposed below that further incentivize involvement for faculty members and their trainees, and thus there are resource implications for the Faculty of Health. In addition, new leadership roles are suggested within the membership to guide these initiatives forward.

We believe that the MHRC brings considerable added-value to the academic reputation of the Faculty of Health, and the University as a whole, through its educational programs, outstanding research and mentors, and knowledge translation. This revised mandate will take this reputation to a new, heightened level. A Table of activities was developed, including a brief description as well as the resources implications, and a brief statement of the “value-added” nature of the activity. Details are found in the Proposal submitted to the Dean of the Faculty of Health on Nov 28, 2019.

Summary Table of Activities, including the following categories:

- 1) Local and international conferences sponsorship;
- 2) Faculty support initiatives;
- 3) Student-based initiatives – designed to help students and support faculty supervisors;
- 4) Initiatives for external visibility and possible revenue generation;
- 5) Structural and Membership initiatives;
- 6) Summary of faculty and student incentives for regular members;
- 7) Requirements for faculty and student membership
- 8) Current MHRC Members and Organization (along with proposed new Committee structures)
- 9) Research groups within the MHRC

Overall Summary of this analysis:

Despite the national and international recognition that many of our MHRC faculty members have as individual scientists, we strongly believe that as a collective group within the MHRC, a greater international impact can be achieved, gaining further recognition for the individual, the Faculty of Health, and the University as a whole. This will be attained by a reformulation of our vision and mandate, and an investment in new initiatives designed to increase faculty member participation in all MHRC, Faculty of Health and University priorities. In this way, the MHRC can truly become a national and international leader in muscle health research, education and training.

List all visitors hosted by the ORU during the report period in this section (indicate each visitor's home institution, whether they are faculty, student, community representative, or other category, the duration of their visit and whether the ORU provided space to the visitor).

	Visitor	Home Institution	Position	Visit length	Space provided Y/N
1.	Dr. Keith Dadson	University Health Network	Professor	1 day	N
2.	Dr. Mireille Khacho	University of Ottawa	Assistant Professor	1 day	N
3.	Dr. Paul Oh	University of Toronto	Medical Director	1 day	N
4.	Dr. Geoffrey A. Power	University of Guelph	Associate Professor	1 day	N
5.	Dr. David J. Dyck	University of Guelph	Professor	1 day	N
6.	Dr. Marina Mourtzakis	University of Waterloo	Associate Professor	1 day	N
7.	Dr. Clark Dickerson	University of Waterloo	Professor	1 day	N
8.	Dr. K Sreekumaran Nair	Mayo Clinic	Consultant in Endocrinology and Professor of Medicine	1 day	N
9.	Dr. Eric Thorin	University of Montreal	Professor	1 day	N
10.	Dr. Andrew Judge	University of Florida	Professor	1 day	N

APPENDIX 3

Space tables in this Appendix are redundant with pages 3-4 of the Annual Report (same information)

Suggestions regarding space – No additional space is required.

Cumulative Financial Statement

ORU: Muscle Health Research Centre (MHRC)								
Cost Centre: 157001								
Account Description	2017-2018 Actuals	2018-2019 Actuals	2019-2020 Actuals	Comments	3 Year Rolling Budget			Additional Comments
					2020-21	2021-22	2022-23	
Revenue:								
Base Allocation from Central								
VPRI support (CR, stipend, operating)								
Faculty support			\$ 50,212.47		\$ 63,914.00	\$ 65,105.73	\$ 66,327.25	
Endowment Revenue								
Indirect Costs (Overhead)								
Support from Grants and Contracts								
Other Internal Revenue			\$ 4,450.00	ICR Donations and grants to support Muscle Health Awareness Day (MHAD) events	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	
Other External Revenue			\$ 6,025.00	Conference registration fees	\$ 7,500.00	\$ 7,500.00	\$ 7,500.00	
TOTAL REVENUE			\$60,687.47		\$72,414.00	\$73,605.73	\$74,827.25	
Expenses:								
Total Faculty Admin. Sal & Ben			\$7,897.92	Director Stipend + Benefits	\$ 7,930.00	\$ 8,128.25	\$ 8,331.46	Year over year FY 20-21 & 21-22 increased by 2.5%
Total Research Staff Sal & Ben								
Total Support Staff Sal & Ben			\$36,810.02	MHRC Coordinator Salary + Benefits	\$ 39,739.00	\$ 40,732.48	\$ 41,750.79	
Total Other Salaries & Ben			\$1,920.00	Honoraria, housing, food and travels costs for guests/invited speakers and associated costs for their seminar presentations at York University (excluding MHAD guests)	\$ 2,400.00	\$ 2,400.00	\$ 2,400.00	
Total Equipment			\$1,860.37	Maintainance and Repairs, lab equipments	\$ 3,800.00	\$ 3,800.00	\$ 3,800.00	
Total Other Expense			\$2,071.12	Annual MHRC Graduate Student Fellowship awards (2 x \$1000) for two graduate students.	\$ 2,620.00	\$ 2,620.00	\$ 2,620.00	
Total Travel & Hospitality			\$8,318.18	Travel, housing accomodations and food for MHRC speakers	\$ 12,425.00	\$ 12,425.00	\$ 12,425.00	
Total Supplies			\$1,809.86	Office Supplies	\$ 3,200.00	\$ 3,200.00	\$ 3,200.00	
Total Telephone & Power			N/A		\$ 300.00	\$ 300.00	\$ 300.00	
TOTAL EXPENSES			\$60,687.47		\$72,414.00	\$73,605.73	\$74,827.25	
Total Revenue Less Total Expenses			\$0.00		\$0.00	\$0.00	\$0.00	
Carryforward from Previous Year			\$0.00		\$0.00	\$0.00	\$0.00	
Balance (cwfd to next year)			\$0.00		\$0.00	\$0.00	\$0.00	