

# Muscle Health Research Centre Annual Report

## May 1, 2013 - April 30, 2014

### 1. Contact Information

Director:	David A. Hood
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E-Mail:	<a href="mailto:dhood@yorku.ca">dhood@yorku.ca</a> or <a href="mailto:mhrc@yorku.ca">mhrc@yorku.ca</a>
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### 2. List Faculties that supplied active members to the ORU, indicating the number of active members from each.

Faculty of Health (13), Faculty of Science and Engineering (2)

### 3. Charter date: July 1, 2008

### 4. Mandate

The MHRC is an organized research unit (ORU) 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 very well-funded and highly productive scholars (including a Canada Research Chair) 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 will achieve this through 1) innovative research, 2) the education of qualified trainees, and 3) the translation of our findings for the benefit of all Canadians.

### 5. Membership and Governance

Active members (York faculty): 15; 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): 91; Graduate and UG student members (non-York, other Universities): 61

Executive Committee members: Drs. David Hood (Director), Olivier Birot, Mike Connor, Robert Tsushima, and Ms. Erin Mandel (Graduate Student Member)

Executive Committee Subcommittee (name and members)(if any): N/A

Faculty Member	Rank	Research Area	Office Number/ E-Mail	Office Location
<b>School of Kinesiology and Health Science</b>				
<b>Hood, David</b>	Professor, Canada Research Chair, Director of the Muscle Health Research Center	Molecular basis of Mitochondrial Biogenesis in health and disease	<a href="mailto:dhood@yorku.ca">dhood@yorku.ca</a>  (416)736-2100 x 66640	Farquharson Building, 302
<b>Adegoke, Olasunkanmi</b>	Associate Professor	Protein and amino acid nutrition and metabolism	<a href="mailto:oadegoke@yorku.ca">oadegoke@yorku.ca</a>  (416)736-2100 x 20887	Norman Bethune College, 362
<b>Belcastro, Angelo</b>	Professor, Chair, School of Kinesiology and Health Science	Muscle injury and damage in health and disease	<a href="mailto:anbelcas@yorku.ca">anbelcas@yorku.ca</a>  (416)736-2100 x 21088	Norman Bethune College, 333B
<b>Birot, Olivier</b>	Associate Professor	Vascular plasticity in striated muscle (angiogenesis vs. capillary regression)	<a href="mailto:birot@yorku.ca">birot@yorku.ca</a>  (416)736-2100 x 44043	Norman Bethune College, 353
<b>Ceddia, Rolando</b>	Associate Professor	Glucose and fat metabolism in muscle and adipose tissue	<a href="mailto:roceddia@yorku.ca">roceddia@yorku.ca</a>  (416)736-2100 x 77204	Lumbers Building, 225A
<b>Connor, Michael</b>	Associate Professor	Muscle Development and Cancer	<a href="mailto:mconnor@yorku.ca">mconnor@yorku.ca</a>  (416)736-2100 x 77206	Life Sciences Building, 423B
<b>Gage, William</b>	Associate Professor, Associate Dean of Research, Faculty of Health	Biomechanics of postural control and of joint stability	<a href="mailto:whgage@yorku.ca">whgage@yorku.ca</a>  (416)736-2100 x 21479	HNES, 428D
<b>Haas, Tara</b>	Associate Professor	Angiogenesis in Muscle	<a href="mailto:thaas@yorku.ca">thaas@yorku.ca</a>  (416)736-2100 x 77313	Farquharson Building, 341
<b>Hamadeh, Mazen</b>	Associate Professor	Human Nutrition and Exercise Physiology, Diabetes and ALS	<a href="mailto:hamadeh@yorku.ca">hamadeh@yorku.ca</a>  (416)736-2100 x 33552	Norman Bethune College, 365
<b>Kuk, Jennifer L.</b>	Associate Professor	Obesity, CVD, Type 2 diabetes and exercise interventions	<a href="mailto:jennkuk@yorku.ca">jennkuk@yorku.ca</a>  (416)736-2100 x 20080	Sherman Health Science Research Centre, 2002
<b>Perry, Christopher G.R.</b>	Assistant Professor	Redox Metabolism, Skeletal Muscle, Diet and Exercise	<a href="mailto:cperry@yorku.ca">cperry@yorku.ca</a>  (416)736-2100 x 33232	Norman Bethune College, 324
<b>Riddell, Michael</b>	Associate Professor, KAHS Graduate Program Director	Exercise Physiology, Stress and Diabetes Metabolism	<a href="mailto:mriddell@yorku.ca">mriddell@yorku.ca</a>  (416)736-2100 x 40493	Norman Bethune College, 347
<b>Scimè, Anthony</b>	Assistant Professor	Stem Cell Biology; Muscle Regeneration; Adipose Differentiation	<a href="mailto:ascime@yorku.ca">ascime@yorku.ca</a>  (416) 736-2100 x33559	Norman Bethune College, 327C

<b>Department of Biology</b>				
<b>McDermott, John</b>	Professor	Muscle Development	<a href="mailto:jmcderm@yorku.ca">jmcderm@yorku.ca</a> (416)736-2100 x 30344	Life Sciences Building, 427B
<b>Tsushima, Robert</b>	Associate Professor, Associate Dean Research and Partnerships	Cardiac Muscle Physiology and Disease	<a href="mailto:tsushima@yorku.ca">tsushima@yorku.ca</a> (416)736-2100 x 20996	Farquharson Building, 344
<b>Adjunct Members</b>				
<b>Cafarelli, Enzo (Emeritus)</b>	Professor Emeritus	Neuromuscular Physiology	<a href="mailto:ecaf@yorku.ca">ecaf@yorku.ca</a>	
<b>Coe, Imogen</b>	Professor, Dean, Faculty of Science	Cardiac Muscle Biochemistry	<a href="mailto:imogen.coe@ryerson.ca">imogen.coe@ryerson.ca</a>	Ryerson University
<b>Hawke, Thomas</b>	Associate Professor	Muscle Development and Regeneration	<a href="mailto:hawke@mcmaster.ca">hawke@mcmaster.ca</a>	McMaster University
<b>Jacobs, Ira</b>	Dean, Faculty of Physical Education	Muscle Metabolism, Applied Physiology and Pharmacology	<a href="mailto:ira.jacobs@utoronto.ca">ira.jacobs@utoronto.ca</a>	University of Toronto
<b>Laham, Robert</b>	Physician	Muscle physiology	robertlaham@aim.com	York Lanes Appletree Medical Centre
<b>Wharton, Sean</b>	Physician	Obesity and exercise	wharton.sean@gmail.com	Wharton Medical Clinic
<b>MHRC Coordinator</b>				
<b>Carter, Heather (July 2012 onwards)</b>	Graduate Student		<a href="mailto:heathery@yorku.ca">heathery@yorku.ca</a> X 77832	Farquharson Bldg, 342 X 22999  Fax: 416-650-8483

## 6. Annual Progress in Fulfilling Mandate

The MHRC continues to expand its activities every year, consistent with the goal of uniting muscle health researchers and graduate students and providing a platform which will serve 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 a truncated 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 research for the health and well-being of Canadians. We are very 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, and a large scale CFI Infrastructure grant for a MHRC “Core facility” (Title: Muscle, Aging and Aging-related Diseases) involving 17 MHRC members and collaborators has received internal approval to go forward as a full proposal to CFI for the June 2014 deadline;

- b) Events organized: We held 3 types of events in the last year:
- 1) Colloquia, featuring internal speakers discussing their work in an informal interactive research presentation. This year we featured 3 graduate students who presented their research;
  - 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, speakers were invited from the Universities of South Carolina, Ottawa, St. Francis Xavier, Montpelier (France), York and Iowa. The latter invited speaker was an MHRC student-organized Seminar;
  - 3) The Annual Muscle Health Awareness Day (MHAD), which attracted 10 external speakers, 15 other faculty members and 98 students. A total of 45 posters were presented (total registration: 123 people). This was our fourth Annual MHAD, and the event grows progressively every year.
- c) Knowledge Mobilization / Outreach: All MHRC faculty members are involved in promoting knowledge mobilization of their research via the MHRC website. 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. 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 trained and mentored 60 MSc and PhD students, 22 undergraduate students, and 9 post-doctoral fellows over the past year alone;
- e) Continuing Education: Over the past year the Director, in collaboration with faculty of Health staff involved in the Health Leadership and Learning network (HLLN), offered continuing education programs in “Muscle Health”, “Exercise” and “Muscle Physiology” specifically directed toward the field of Message Therapy. Further offerings will be developed specifically for Teachers and Nurses.
- f) Other leadership activities: The MHRC sponsored one Faculty Research Award (\$3000) and two MHRC Student Fellowships directed against the Graduate Student’s fees;
- g) Industry partners: The MHRC has developed relationships with industry on two fronts, including Panacea Global, a cancer screening company with research interests that complement several of our members, and OmniActive Health Technologies Canada, a Natural Health Product company with an interest in muscle health and obesity;
- h) Student-based activities: In the past year the MHRC significantly increased the involvement of our student members. We created an MHRC Student Committee to provide input into our programming and direction, particularly with regard to student interests. In particular, the mandate of this Committee is to provide more student input regarding MHRC Seminars and the Muscle Health Awareness Day program. Our students now manage the MHRC Facebook page, and we have a student-invited Seminar speaker for the first time this year. We are developing a Career Workshop (planned for May 2, 2014) for those interested in careers outside of academia. Invited guests from Industry, Colleges, Hospitals and Research Institutes are invited to present short talks on their career paths, and provide advice for future graduates. We also sponsored our first MHRC Student Colloquium, in which graduate students presented their work orally and responded to questions.

## 7. **Financial Accountability**

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, but that a cash contribution of up to \$20k has been provisionally committed in year three if this is needed to balance the budget. The Faculty will also fund 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), fundraising, and industry or granting agency contract overhead contributions.

## 8. **Objectives for Upcoming Year**

- a) Adopt the recommendations of the External Reviewer Report. The external review process for the MHRC took place on January 20, 2014. The Reviewers provided a largely favourable report of our activities, and made some constructive suggestions for improvement. One of our main goals for the coming year will be to assess these recommendations and try to adopt these suggestions wherever possible;
- b) Continue to try to develop Continuing Education initiatives with Teachers, Nurses, Massage Therapists in an effort to bring in revenue to support the MHRC;
- c) Interact with our Development office within the University 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.
- d) Develop 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. We have begun to investigate venues in downtown Toronto (eg. the Central YMCA) for this initiative;
- e) Develop more relationships with industry to initiate contractual agreements which will bring in revenue for the MHRC. Discussion are ongoing with colleagues in Innovation York to help us with this;
- f) Consider having a grant crafting workshop, one or twice a year;
- g) Develop more collaborations between laboratories within the MHRC.

## 9. **Other relevant items the Director wishes to report**

(None)

10. **Appendix 1** – Additional Information about Progress in Fulfilling Mandate (that does not appear elsewhere in the Report). (N/A; not included)
11. **Appendix 2** – Individual Member Contributions (up to five most notable items only for each member)

Appendix 2 is attached. Please note that this represents only a small sampling of the publications and achievements of our MHRC faculty members, as requested for this Annual Report template. A more complete list is available at [yorku.ca/mhrc/](http://yorku.ca/mhrc/)

## **Appendix 2: TOP 5 CONTRIBUTIONS between May, 1 2013 – April 30, 2014**

### **Olasunkanmi A.J. Adegoke**

#### **Funding Received:**

**NSERC Discovery Grant:** “Mechanism of nutritional regulation of protein metabolism in skeletal muscle”

2008/2009

\$100,000.00 over 5 years

**York University Faculty of Health Minor Research Grant:** “Branched-chain amino acid metabolism and regulation of muscle differentiation”

May 2012.

\$3000

**York University Muscle Health Research Centre Faculty Research Grant**

October 2013.

\$3000

#### **Publications**

##### **Accepted:**

Kakade D, Islam N, Maeda N, Adegoke OA. Differential effects of PDCD4 depletion on protein synthesis in myoblast and myotubes. BMC Cell Biol. 2014 Jan 9;15:2.

##### **In submission/preparation:**

Adegoke OA, Bates H, Kiraly M, Vranic M, Riddell MC, and Marliss E. Exercise in ZDF rats does not attenuate weight gain, but prevents hyperglycemia concurrent with modulation of amino acid metabolism and AKT/mTOR activation in skeletal muscle. Submitted to Eur J Nutrition. Manuscript number: EJON-D-14-00123. Submitted March 3 2014.

### **Angelo N. Belcastro**

#### **Publications**

##### **In submission/preparation:**

Belcastro AN, Booker T, Arthur G and Adelbert D. Response of muscle calpain and myeloperoxidase activities to graded exercise intensity Submission date: Summer/Fall 2014.

Parsons K and Belcastro AN. Physical Activity and Physical Fitness Attributes of School-based Physical Education Programs Submission date: Fall 2014.

Moghaddasazadeh A, Jamnik V, Belcastro AN. Accelerometry (ACC) of Children’s Physical Activity During self-paced Games. Submission date: Summer/Fall 2014.

## **Olivier Birot**

### **Funding Received:**

**NSERC Research Tools and Instruments:** “Multi-modal plate reader”

Co-PI with Dr. Tara Haas

2013

\$40,741

### **Funding Applied For:**

**CIHR:** “New insight in adaptive angiogenesis in peripheral vascular disease: Role of myofibroblast/endothelial cell interactions in human skeletal muscle”

Co-PI with Dr. Grenier (U. Sherbrooke)

March 2014

Under review

### **Publications**

#### **Accepted:**

Roudier E, Aiken J, Slopack Dara, Gouzi F, Mercier J, Haas TL, Gustaffson T, Hayot M, Birot, O. Novel perspective: Exercise training stimulus triggers the expression of the oncoprotein Human Double Minute-2 in human skeletal muscle. In press in *Physiological Reports* 2013.

Roudier E, Milkiewicz M, Birot O, Slopack D, Paik, Depinho P, Casale G, Pipinos P, Haas TL. FoxO transcription factors are critical regulators of angiogenesis within ischemic skeletal muscle. *Angiogenesis* 16:759-772, 2013.

Gouzi F, Prefaut C, Abdellaoui A, Roudier E, de Rigal P, Molinari N, Laoudj-Chenivresse D, Mercier J, Birot O, Hayot M. Blunted muscle angiogenic training-response in COPD patients versus sedentary controls. *European Respiratory Journal* 41:806-14, 2013).

## **Rolando B. Ceddia**

### **Funding Received:**

**NSERC Discovery Grant:** “Regulation of whole-body energy metabolism”

2011–2016

\$200,000 over 5 years

Vitzel KF, Bikopoulos G, Hung S, Curi R, Ceddia RB. Loss of the anorexic response to systemic 5-aminoimidazole-4-carboxamide-1- $\beta$ -D-ribofuranoside administration despite reducing hypothalamic AMP-activated protein kinase phosphorylation in insulin-deficient rats. *PLoS One*. 8(8):e71944, 2013.

Trajcevski KE, O'Neill HM, Wang DC, Thomas MM, Al-Sajee D, Steinberg GR, Ceddia RB, Hawke TJ. Enhanced lipid oxidation and maintenance of muscle insulin sensitivity despite glucose intolerance in a diet-induced obesity mouse model. *PLoS One*. 8(8):e71747, 2013.

Vitzel KF, Bikopoulos G, Hung S, Pistor KE, Patterson JD, Curi R, Ceddia RB. Chronic Treatment with the AMP-Kinase Activator AICAR Increases Glycogen Storage and Fatty Acid Oxidation in Skeletal Muscles but Does Not Reduce Hyperglucagonemia and Hyperglycemia in Insulin Deficient Rats. *PLoS One*. 19;8(4):e62190, 2013.

Ceddia RB. The role of AMP-activated protein kinase in regulating white adipose tissue metabolism. *Mol Cell Endocrinol.* 25;366(2):194-203, 2013.

## **Michael K. Connor**

### **Funding Received:**

**York University Faculty of Health Minor Research Grants:** “The Paracrine Role of Adipokines in Prostate Cancer”

2013-2015

\$2,850 per year

**CFI Infrastructure Operating Funds:** “Molecular regulation of muscle development”

2012-2015

\$50,000

### **Funding Applied for:**

**Prostate Cancer Canada:** “The paracrine/endocrine effects of adipose tissue on prostate cancer”

07/ 2014 - 06/2016

\$190,400 (Principle Investigator, Co-PIs: Neil Fleshner)

Thomas MM, Wang DC, D’Souza DM, Krause MP, Layne AS, Criswell DS, O’Neill HM, Connor MK, Anderson JE, Kemp BE, Steinberg GR and Hawke TJ. Muscle-Specific AMPK  $\beta$ 1- $\beta$ 2-null mice display a myopathy resultant from impairments in blood flow. *FASEB J.* In press, 2014.

McDermott J, Dionyssiou M, Ehyai S, Avrutin E, Connor MK. Glycogen synthase kinase 3 $\beta$  represses Myogenin function in Alveolar Rhabdomyosarcoma. *Cell Death Dis.* In Press, 2014.

## **William Gage**

### **Funding Received:**

**Canadian Foundation for Innovation Leading Edge and New Initiatives Funds:** “Full field vision and spatial orientation”

Principal Investigator: Laurence Harris

Co-applicants: William Gage, Andrew Hogue; Bill Kapralos; Jennifer Campos; Laurie Wilcox; Robert Alison

Co-investigators: Michael Jenkin

2013/11 - 2018/10

\$790,891

### **Awards**

March 2013                      York University Research Leader

### **Publications**

Phadke CP, Ismail F, Boulias C, Gage W, Mochizuki G. The impact of post-stroke spasticity and botulinum toxin on standing balance: a systematic review. *Expert Rev Neurother.* 2014Mar;14(3):319-27.



Street BD, Wong W, Rotondi M, Gage W. Younger patients report greater improvement in self-reported function after knee joint replacement. *J Orthop Sports Phys Ther.* 2013 Sep;43(9):666-72

Street BD, Gage W. The effects of an adopted narrow gait on the external adduction moment at the knee joint during level walking: evidence of asymmetry. *Hum Mov Sci.* 2013 Apr;32(2):301-13.

### **Tara L. Haas**

#### **Funding Received:**

**CIHR:** “Microvascular remodeling of the adipose and muscle tissues in diet-induced obesity: regulation by FoxO proteins” (Principal Investigator; 1 Co-applicant: E. Roudier)  
2013  
\$97,700/yr (4 years)

#### **NSERC Research Tools and Instruments:** “Multi-modal plate reader”

2013  
\$40,741 (PI; 1 co-applicant: O. Birot)

Gorman JL, Liu STK, Slopack D, Shariati K, Hasanee A, Olenich S, Olfert IM and Haas TL. Angiotensin II evokes angiogenic signals within skeletal muscle through co-ordinated effects on skeletal myocytes and endothelial cells. *PLoS One.* 2014 Jan 9;9(1):e85537. doi: 10.1371/journal.pone.0085537

Haas TL. Shaping and Remodeling of the Fetoplacental Circulation: Aspects of Health and Disease. *Microcirculation* 2014 Jan;21(1):1-3. doi: 10.1111/micc.12084

Roudier E, Milkiewicz M, Birot O, Slopack D, Montelius A, Gustafsson T, Paik JH, DePinho RA, Casale GP, Pipinos II, Haas TL. Endothelial FoxO1 is an intrinsic regulator of thrombospondin1 expression that restrains angiogenesis in ischemic muscle. *Angiogenesis* 2013 16(4):759-772, DOI: 10.1007/s10456-013-9353-x

### **Mazen J. Hamadeh**

#### **Funding Received:**

**York University Faculty of Health Minor Research Grant:** “Molecular mechanisms in the central nervous system following high dose vitamin D supplementation in amyotrophic lateral sclerosis”  
May 2013  
\$3,000 (PI)

#### **Funding Applied for:**

**CIHR:** “Optimal vitamin D supplementation in mitigating amyotrophic lateral sclerosis”  
March 2014  
\$404,403 over 3 years (PI)  
Results: Awaiting response

Gianforcaro A, Hamadeh MJ. Vitamin D as a potential therapy in amyotrophic lateral sclerosis. *CNS Neurosci Ther* 2014;20(2):101-11. doi: 10.1111/cns.12204  
<http://onlinelibrary.wiley.com/doi/10.1111/cns.12204/abstract>

Devries MC, Samjoo IA, Hamadeh MJ, McCreedy C, Sischek S, Raha S, Watt MJ, Steinberg GR, Tarnopolsky MA. Endurance training modulates intramyocellular lipid compartmentalization and morphology in skeletal muscle of lean and obese women. *J Clin Endocrinol Metab* 2013;98(12):4852. doi: <http://dx.doi.org/10.1210/jc.2013-2044> <http://jcem.endojournals.org/content/98/12/4852.abstract>

Samjoo IA, Safdar A, Hamadeh MJ, Raha S, Tarnopolsky MA. The effect of endurance exercise on both skeletal muscle and systemic oxidative stress in previously sedentary obese men. *Nutr Diabetes* 2013;3:e88. doi:10.1038/nutd.2013.30  
<http://www.nature.com/nutd/journal/v3/n9/full/nutd201330a.html>

## **David A. Hood**

### **Funding Received:**

**Mitacs (University-Industry) partnership grant**

2014-2017

\$30,000 per year

**CIHR Research Grant:** "Mitochondria in Aging Skeletal Muscle"

2013-2018

\$117,937 per year

**NSERC Discovery Grant:** "Mitochondrial Biogenesis in Skeletal Muscle"

2011-2016

\$110,000 per year

### **Awards**

2013

York University Faculty of Health Teaching Award (Established Career)

### **Publications**

Menzies KJ, Singh K, Saleem A and Hood DA. Sirtuin 1-mediated effects of exercise and resveratrol on mitochondrial biogenesis. *J. Biol. Chem.* 288: 6968-79, 2013.

## **Jennifer L. Kuk**

### **Funding Received:**

**CIHR New Investigator Bridge Funding:** "Causes and Implications of Metabolically Healthy Obese"

(2014 - #131594)

\$100,000 (Co-PI)

**National, Heart, Lung, and Blood Institute:** "Resistance and Cardiorespiratory Time-matched Exercise in Youth: A Randomized Clinical Trial (RCT:RCT)"

2013-2017 - 1R01HL114857-01A1:

\$5,587,453 (Co-Investigator).

### **Publications**

Canning KL, Brown RE, Jamnik RE, Kuk JL: The Relationship between Obesity and Obesity-Related Morbidities Weakens with Ageing (*J Gerontology* – Jan;69(1):87-92, 2014).

Lee SJ, Kuk JL: Changes in fat and skeletal muscle with exercise training in obese adolescents: comparison of whole-body MRI and dual energy X-ray absorptiometry (Obesity – Oct;21(10):2063-71, 2013).

Brown RE, Riddell MC, MacPherson AK, Canning KL, Kuk JL: The influence of physical activity, pharmacological treatment, and control on mortality risk for hypertension in U.S. adults (Am J Hypertension Aug;26(8):1005-10, 2013).

### **John C. McDermott**

#### **Funding Received:**

**CIHR Operating Grant:** “Regulation of MEF2 in cardiac and skeletal muscle cells”

2013-2018

\$578,000

**CIHR Operating Grant:** “Role of Smad7 in Cardiac and Skeletal muscle”

2013-2018

\$542,000

#### **Publications**

##### **Accepted:**

Belozerov VE, Ratkovic S, McNeill H, Hilliker AJ, McDermott JC. In Vivo Interaction Proteomics Reveal a Novel p38 Mitogen-Activated Protein Kinase/Rack1 Pathway Regulating Proteostasis in Drosophila Muscle. Mol Cell Biol. 2014 Feb;34 (3):474-84.

Alli NS, Yang EC, Miyake T, Aziz A, Collins-Hooper H, Patel K, McDermott JC. Signal-dependent Fra-2 regulation in skeletal muscle reserve and satellite cells. Cell Death Dis. 2013 Jun 27;4:e692. doi: 10.1038/cddis.2013.221.

Dionyssiou MG, Salma J, Bevzyuk M, Wales S, L LZ, McDermott JC. Kruppel-like factor 6 (KLF6) promotes cell proliferation in skeletal myoblasts in response to TGFbeta/Smad3 signaling. Skeletal Muscle. 2013 Apr 2;3(1):7.

### **Christopher G. R. Perry**

#### **Funding Received:**

**CFI John R. Evans Leaders Fund and Ontario Research Fund:** “Integrative mitochondrial bioenergetic facility for the study of muscle wasting diseases”

2014

\$267,914

**The James H. Cummings Foundation Grant:** “Acquisition of a PTI Quantamaster 40 spectrofluorometer for the study of mitochondrial bioenergetics in muscular dystrophy”

2013

\$56,000

**NSERC Discovery:** “A novel paradigm of metabolic regulation: acute and chronic redox-circuitry control of energy homeostasis”

2013-2018

\$145,000 (Principal Investigator)

## **Publications**

### **Accepted:**

Debalsi KL, Wong KE, Koves TR, Slentz DH, Seiler SE, Wittmann AH, Ilkayeva OR, Stevens RD, Perry CGR, Lark DS, Hui ST, Szweda L, Neuffer PD, Muoio DM. Targeted metabolomics connects TXNIP to mitochondrial fuel selection and regulation of specific oxidoreductase enzymes in skeletal muscle. *J Biol Chem*. 2014 Jan 30 (Epub). PMID: 24482226

De Sousa M, Porras DP, Perry CGR, Seale P, Scime A. p107 is a crucial regulator for determining the adipocyte lineage fate choices of stem cells. *Stem Cells*. 2014 Jan 21 (Epub). Doi: 10.1002/stem.1637. PMID: 24449206

Perry CGR, Kane DA, Lanza I, Neuffer PD. Methods for assessing mitochondrial function in Diabetes. Invited Review, *Diabetes*. 62(4): 1041-1053, 2013. PMID: 23520284

## **Michael C. Riddell**

### **Funding Received:**

**NSERC Discovery Grant** (individual- 3<sup>rd</sup> renewal): "Examining the mechanisms for the lipolytic and antilipolytic effects of glucocorticoids in adipose tissue." Grant #261306

2013-2017

\$165,000

**CIHR Proof of Principle Program:** "Phase I: Pharmaceutical intervention to decrease the threat of hypoglycemia in insulin-treated diabetics" (with M. Vranic).

10/1/2011- 03/31/2014

\$160,000

**NIH Operating Grant #1DP3DK101075-01:** "Control systems for Artificial Pancreas use during and after exercise."

2013-2017

\$2,478,076 (Subcontract to York= \$364,000.)

### **Accepted:**

JL Beaudry, EC Dunford, DP Zaharieva, T Teich, H Hunt, J Belanoff, MC Riddell. Effects of Selective and Non-Selective Glucocorticoid Receptor II Antagonists on Rapid-onset Diabetes in Young Rats. Submitted to *PLOS ONE*. Sept 24th, 2013, PONE-D-13-38335.

P Galassetti and MC Riddell. Exercise and Type 1 Diabetes (T1DM). *American Physiological Society. Compr Physiol* 2013 Jul;3(3):1309-36. PMID:23897688.

## **Anthony Scimè**

### **Funding Received:**

**Centres of Excellence - Stem Cell Network - Stem Cell Drug Discovery** "Discovery of compounds that specify mesenchymal stem cells to the brown adipocyte lineage"

August 2013

\$75,000 one-time

**Funding Applied for:**

**CIHR Discovery Grant** "Understanding the role of p107 in differentiation pathways that control bioenergetic switching"

March 2014

\$153,100 (4 years)

**Publications****Accepted:**

**Scimè A**, (2012). The heat is on: a new avenue to study brown fat formation in humans. *Frontiers in Cellular Endocrinology*. Jan. 13: 2:118.

**Robert G. Tsushima****Funding Received:**

07.2011 – 06.2014 *Role of Endogenous Cholesterol in Beta-Cell Stimulus-Secretion Coupling*  
Principal Investigator  
Canadian Diabetes Association (OG) - \$274,725 (total)

**Awards**

August 2009 – Career Investigator Award

June 2014 Heart and Stroke Foundation of Ontario – \$438,750

**Publications****Accepted:**

Beaudry JL, D'souza AM, Teich T, **Tsushima R**, Riddell MC. Exogenous glucocorticoids and a high-fat diet cause severe hyperglycemia and hyperinsulinemia and limit islet glucose responsiveness in young male Sprague-Dawley rats. *Endocrinology* 154(9):3197-3208, 2013.

**In preparation/submission:**

Yamakawa T, Saith S, Butt B, Backx A, Gao X, Gaisano HY, **Tsushima RG**. Interaction of MiRP1 with the KChIP2 binding site to regulate Kv4.2 channel gating. In preparation

Rodness J, Ni N, Cooper AJ, Singh K, Patel S, Woodgett JR, Hood DA, **Tsushima RG**. The mitochondrial permeability transition pore and mitochondrial ATP-sensitive potassium channel are not downstream targets of the PI3K- GSK3 $\beta$  pathway in protecting the heart from ischemia-reperfusion injury. In preparation

<b>Muscle Health Reseach Centre: Three year budget plan</b>				
<b>Revenue</b>	<b>2014-15</b>	<b>2015-16</b>	<b>2016-17</b>	
Muscle Health Awareness Day sponsorship	2,000	2,500	2,500	
Muscle Health Awareness Day conference registration fees	1,750	2,000	2,000	
Continuing professional development workshop fees	3,000	3,000	3,500	
Diagnostic services fees (@ \$5/sample)	2,500	2,500	3,000	
Anticipated overhead from research contracts	2,000	2,000	2,500	
Contribution from Health - Director's course release (1.0 FCE)	20,000	20,000	20,000	approximate
Contribution from Health			20,000	provisional - if advancement efforts are unsuccessful
Costs covered by Director's CRC	10,000	10,000	10,000	
<b>Total Revenue</b>	<b>41,250</b>	<b>42,000</b>	<b>63,500</b>	
<b>Expenses</b>				
<b>Operating Expenses</b>				
Director's Stipend and Benefits	7,200	7,200	7,200	
Director's course release (1.0 FCE)	20,000	20,000	20,000	approximate
Admin Support (CUPE GA 270hr + 135hr assignment @ 60%)	10,920	10,920	10,920	approximate
Office/Computer Supplies	1,200	1,200	1,200	
Telephone	1,200	1,200	1,200	
<b>Research, Training and KMB Expenses</b>				
MHRC Faculty Research Awards (1 @ \$3000)	3,000	3,000	3,000	seeking donor
MHRC Student Scholarships (2 @ \$1000)	2,000	2,000	2,000	seeking donor
Muscle Health Awareness Day	5,000	5,000	5,000	seeking additional sponsors
Poster Prizes for Muscle Health Awareness Day (4 @ \$150)	600	600	600	seeking additional sponsors
Seminar series - hospitality and invited speakers	4,500	4,500	5,000	
<b>Total Expenses</b>	<b>55,620</b>	<b>55,620</b>	<b>56,120</b>	
<b>Total Revenue Less Expenses</b>	<b>(14,370)</b>	<b>(13,620)</b>	<b>7,380</b>	
<b>Carryforward From Previous Year</b>	<b>27,000</b>	<b>12,630</b>	<b>(990)</b>	
<b>Carryforward to Next Year</b>	<b>12,630</b>	<b>-990</b>	<b>6,390</b>	