Muscle Health Research Centre Annual Report
July 1, 2010 - June 30, 2011

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1. Mandate of the Unit

The mandate of the MHRC 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 became York University's first organized research unit (ORU) in the Faculty of Health dedicated to Biomedical Sciences, and it continues to increase the University's visibility in this important area of research. The UAP calls for the University to ***intensify and widen the research culture at the University***, build on the ***focus in health research and education*** and ***improve our reputations***. Fundamentally, ORUs advance a vibrant and collaborative research program, provide an institutional platform from which to seek external funding, and foster a rich environment for graduate students' learning and research, and strengthen the University's research profile and reputation. The establishment of the *Muscle Health Research Centre* in particular, with its focus on biomedical health science research, consisting of a strong cohort of well-funded scholars (including a Canada Research Chair) and graduate students from the Faculty of Health and the Faculty of Science & Engineering, and its intention of becoming a renowned centre for muscle health research in North America, is making significant contributions towards each of the above-noted UAP objectives.

2. Organizational Structure of the Unit

Executive Committee (elected for a 3 year term):
Director: David A. Hood
Faculty Members: Rolando Ceddia, Michael Riddell (both Kinesiology and Health Science) and Robert Tsushima (Biology);
PhD student member: Michael O'Leary.
Advisory Board: we do not have one

3. Membership List

Appendix A contains the list of the 14 active, 2 Adjunct and 1 Emeritus Faculty members of the MHRC in 2010-11. New members to the MHRC require a nomination from an existing member, and membership is voted upon by the group. Support by fifty percent plus one of the existing members is required to gain MHRC membership.

4. Activities of the Unit

The research accomplishments of the MHRC are outlined in detail in Appendices B (Funding obtained), C (Awards) and D (Publications in peer-reviewed journals). It is very clear from these extensive lists that the MHRC is fulfilling its mandate in promoting muscle research for the health and well-being of Canadians.

We held 2 successful Colloquia over the course of the year, attended by approximately 70 faculty members and students each. In addition, we continue to develop and expand the annual Muscle Health Awareness Day. For our second annual event in 2011, 10 guest speakers from around the province spoke of their research, and they were appreciated by about 130 total attendees. The student posters, a total of 43, were also well attended. We also sponsored the Ontario Exercise Physiology meeting held in January, 2011, with the initiation of 2 graduate student presentation awards. This meeting is attended by 110-130 participants every year, and this is an excellent way of increasing the visibility of the MHRC and York University. In addition, we were very pleased to be able to hosted Dr. Bengt Saltin, who was presented with an Honorary Doctorate at the Faculty of Health Spring Convocation. Dr. Saltin is a very prominent exercise physiologist who was the founder of the Copenhagen Muscle Research Institute, the model that that we used to develop the MHRC. Dr. Saltin also presented a very informative and entertaining seminar which was attended, not only by York University members, but also faculty and students from other institutions. Thus, we had a very successful year, and we continue to expand our functions and our outreach.

Number of Collaborative grants between MHRC members: (1) Gage-Hood (CIHR)
Number of collaborative peer-reviewed publications between MHRC members: (9)

5. Measures taken to Promote Equity as Enunciated in the University Academic Plan

There are 2 female faculty members and 1 administrative assistant members of the MHRC out of 16 members. This inequity can be addressed within the hiring of future faculty members in both the faculty of Health and the faculty of Science and Engineering. However, student membership is more evenly balanced, at approximately 45% female, and 55% male. Our list of research publications and grants provide clear evidence for excellence and innovation in research. This fulfills an important component of the mandate of the UAP.

6. Statement of Operations

Attached as a .pdf file along with this document for 2010-11.

7. Budget for Current Fiscal Year

Attached as a .pdf file along with this document for 2010-11.

8. Graduate Training Activities/Accomplishments

In its second year of operation, the MHRC had 79 graduate student and trainees (48% male, 52% female):

--25 MSc students members;
--9 PhD students members;
-- 5 postdoctoral fellow members;
-- 17 undergrad students members;
-- 23 alumni/graduates from York University

9. **Any Changes in Physical Space at the Unit:** None.

10. **List of all Contractual Obligations Entered into By or on Behalf of the Unit:** None.

Appendix A:
Muscle Health Research Centre Active Membership List

Faculty Member	Rank	Research Area	Office Number/ E-Mail	Office Location
School of Kinesiology and Health Science				
Hood, David	Professor, CRC Director of Muscle Health Research Center	Molecular basis of Mitochondrial Biogenesis in health and disease	dhood@yorku.ca (416)736-2100 x 66640	Farquharson Building, 302
Adegoke, Olasunkanmi	Assistant Professor	Protein and amino acid nutrition and metabolism	oadegoke@yorku.ca (416)736-2100 x 20887	Norman Bethune College, 362
Belcastro, Angelo	Professor and Chair, School of Kinesiology and Health Science	Muscle injury and damage in health and disease	anbelcas@yorku.ca (416)736-2100 x 21088	Norman Bethune College, 333B
Birot, Olivier	Assistant Professor	Vascular plasticity in striated muscle (angiogenesis vs. capillary regression)	birot@yorku.ca (416)736-2100 x 44043	Norman Bethune College, 353
Cafarelli, Enzo (Emeritus)	Professor Emeritus	Neuromuscular Physiology	ecaf@yorku.ca	
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	Lumbers Building, 224
Gage, William	Associate Professor and Associate Dean, Research and Innivation, Faculty of Health	Biomechanics of postural control and of joint stability	whgage@yorku.ca (416)736-2100 x 33027	Norman Bethune College, 364
Haas, Tara	Associate Professor	Angiogenesis in Muscle	thaas@yorku.ca (416)736-2100 x 77313	Farquharson Building, 341
Hamadeh, Mazen	Associate Professor	Human Nutrition and Exercise Physiology, Diabetes and ALS	hamadeh@yorku.ca (416)736-2100 x 33552	Norman Bethune College, 365
Hawke, Thomas (Adjunct)	Associate Professor	Muscle Development and Regeneration	thawke@yorku.ca	McMaster University
Jacobs, Ira (Adjunct)	Dean, Faculty of Physical Education, University of Toronto	Muscle Metabolism, Applied Physiology and Pharmacology	ijacobs@yorku.ca	University of Toronto

Riddell, Michael	Associate Professor and Graduate Program Director, KAHS	Exercise Physiology, Stress and Diabetes Metabolism	mriddell@yorku.ca (416)736-2100 x 40493	Norman Bethune College, 347
Scimé, Anthony	Assistant Professor	Stem Cell Biology; Muscle Regeneration; Adipose Differentiation	ascime@yorku.ca (416) 736-2100 x33559	Norman Bethune College, 327C
Department of Biology				
Coe, Imogen	Professor and Chair, Dept. of Biology	Cardiac Muscle Biochemistry	coe@yorku.ca (416)736-5243	Farquharson Building, 246 A
McDermott, John	Professor and Graduate Program Director, Biology	Muscle Development	jmcderm@yorku.ca (416)736-2100 x 30389	Farquharson Building, 327
Tsushima, Robert	Associate Professor	Cardiac Muscle Physiology and Disease	tsushima@yorku.ca (416)736-2100 x 20996	Farquharson Building, 344
MHRC Coordinator				
Saleem, Ayesha	Graduate Student		asaleem@yorku.ca X 77832	Farqhuarson Bldg, 342 X 22999 Fax: 416-650-8483

Appendix B: FUNDING RECEIVED or CONTINUING between July, 1 2010 – June 30, 2011

1. O. Adegoke

External:

- NSERC Discovery Grant, 2008/2009 Competition: $100,000.00 over 5 years to study 'Mechanism of nutritional regulation of protein metabolism in skeletal muscle'.

2. O. Birot

NSERC discovery grant (5 years)
FCRF 2011

3. R. Ceddia

NSERC *Discovery Grant*
Project Title: Regulation of whole-body energy metabolism
Funding period: 5 years (2011 – 2016) **Amount awarded**: $200,000.00

4. I. Coe

EXTERNAL RESEARCH FUNDING

1. NSERC Discovery Grant 2011-2016 $56,000 per year.

2. 2007-2012, Canadian Institutes for Health Research Operating Grant
Amount: $541,930
Role of Nucleoside Transporters in Cardiovascular Physiology

3. 2003-2010, Natural Science and Engineering Research Council (NSERC) ; Amount: $191,100
Molecular Evolution of Nucleoside Transporters (note that this grant was extended, without change in award amount, for the 3 years that I served on GSC 32).

5. M. Connor

Natural Sciences & Engineering Research Operating Grant
$29,500/yr 09/2006- 08/2011

6. W. Gage

Title: Acute effects of mechanical loads on bone and cartilage turnover:
A pilot study to develop a model for human research.
Investigators: William Gage (PI), David Hood (co-Applicant), Jason Vescovi (co-Applicant)
Amount: $98,875

7. T. Haas

EXTERNAL RESEARCH FUNDING:

2010 CIHR Operating Grant Priority Announcment; $98,097 (1 year)
September start

2010 Heart and Stroke Foundation of Ontario; $75,000/year (3 years)
July start

8. M. Hamadeh

January 2011 The influence of very high dietary vitamin D3 on disease onset, disease progression, lifespan and molecular mechanisms in the transgenic G93A mouse model of ALS
Minor Research Grant, Faculty of Health, York University, $3,000 (PI).

August 2010 Project RADICAL: Race/ethnicity And the perception of Diabetes and cardiovascular disease risk factors In the context of Canada's Lifestyle and obesity guidelines
Heart and Stroke Foundation of Ontario, Pilot Grant, Co-applicant, $50,000 (PI: Dr. Jennifer Kuk).

9. D.A. Hood

Natural Science and Engineering Research Council of Canada Discovery Grant entitled: "Mitochondrial Biogenesis in Skeletal Muscle" ($110,000 per year), 2011-2016.

Natural Science and Engineering Research Council of Canada Research Tools and Instruments Grant entitled: "Imaging System" ($54,400 for 2011).

CIHR Operating Grant entitled: "Mitochondria in aging muscle" (106,109 per year, 2008-2012).

10. J. McDermott

2006-2011 **NSERC Discovery grant,** $248,000 Role of AP-1 in skeletal myogenesis

2005-2010: **CIHR operating grant**, $507,000 Role of SMAD 7 in cardiac and skeletal muscle

11. M. Riddell

External grants as principle investigator (Active Total= $ 648,225 currently awarded):

1. CIHR Proof of Principle Program - $160, 000 (2011-2012) Phase I: Pharmaceutical intervention to decrease the threat of hypoglycemia in insulin-treated diabetics (with M. Vranic).

2. NSERC Discovery Grant (individual). $190,000 (2007-2012), Project Title: Mechanisms of exercise training induced alterations in the hypothalamo-pituitary-adrenal axis.

3. Centre for Drug Research and Development (Pfizer CDRD Innovation Fund) with support from MaRS innovation (Leaders M. Vranic, M. Riddell and D. Coy). $294,350 (2011-2012).

External grants as co-applicant

1. CIHR Operating Grant (P.I. Timmons, Co-investigators MORRISON, Katherine Mary; RIDDELL, Michael C). $225,347 (20011-2013). Metabolic flexibility in obese youth: Exercise as a screening test and a treatment, Competition 2010/09.

2. CIHR Team Grant (Nutrition, Metabolism and Diabetes): Obesity and Related Diseases - Operating Grant Title: CIHR Team in Childhood Obesity Research. 2008-05-01 to: 2013-04-30. 468,799 per year.(2,34995 total).
Principle Investigator(s): ANDERSON, Gerald Harvey ; HAMILTON, Jill Krysti ; MCCRINDLE, Brian Wayne ; PARKIN, Patricia ; PENCHARZ, Paul Bernard Co-Investigators: BELLISSIMO, Nicola ; BIRKEN, Catherine Sari ; DETTMER, Elizabeth Lynn ; HANLEY, Anthony James ; LANGER, Jacob Charles ; O'CONNOR, Deborah Louise ; RIDDELL, Michael Charles ; TEIN, Ingrid ; WELLS, Greg D.

3. Ontario's Ministry of Health Promotion and Sport Research Contract. (Drs. Norm Gledhill, Roni Jamnik, and Michael Riddell). Co-Investigators Chris Ardern, and Jennifer Kuk). 300,000. Project Title: "Pre-Diabetes Detection and Physical Activity Intervention" Phase III trial. April 1, 2010-March 31st 2011.

4. Ontario Trillium Foundation (Drs. Norm Gledhill, Roni Jamnik, and Michael Riddell; with Co-Investigators Drs. Paul Ritvo, Chris Ardern, and Jennifer Kuk). 213,800 (11/2009-11/2010) Detection of pre-diabetes conditions and implement culturally preferred physical activity interventions in the greater Toronto area (GTA), Thunder Bay, and Sault Sault Ste. Marie

12. R. Tsushima

07.2008 – 06.2011 Cell Signalling in Myocardial Ischemic Preconditioning (Principal Investigator)
Heart and Stroke Foundation of Ontario (NA 6292) - $239,100

07.2008 – 06.2011 *Role of Endogenous Cholesterol in Beta-Cell Stimulus-Secretion Coupling* (Principal Investigator)
Canadian Diabetes Association (OG-3-08-2615-RT) - $285,000

07.2009 – 06.2013 *SNARE Protein Regulation of Cardiac Ion Channels and ANF Secretion* (Principal Investigator)
Heart and Stroke Foundation of Ontario (T6770) - $409,181

Appendix C: AWARDS RECEIVED between July, 1 2010 – June 30, 2011

D. Hood
Canadian Society for Exercise Physiology (CSEP) Honour Award, Oct, 2011

Appendix D: PUBMED-listed publications by MHRC Faculty members between July, 1 2010 – June 30, 2011

- **Olasunkanmi Adegoke**

Zargar S, Moreira TS, Samimi-Seisan H, Jeganathan S, Kakade D, Islam N, Campbell J, **Adegoke OA**. Skeletal muscle protein synthesis and the abundance of the mRNA translation initiation repressor PDCD4 are inversely regulated by fasting and refeeding in rats. Am J Physiol Endocrinol Metab. 2011 Jun;300(6):E986-92.

Gordon CS, Serino AS, Krause MP, Campbell JE, Cafarelli E, **Adegoke OA**, Hawke TJ, Riddell MC. Impaired growth and force production in skeletal muscles of young partially pancreatectomized rats: a model of adolescent type 1 diabetic myopathy? PLoS One. 2010 Nov 17;5(11):e14032.

- **Olivier Birot**

Milkiewicz, M., E. Roudier, J.L. Doyle, A. Trifonova, **O. Birot**, T.L. Haas. Identification of a mechanism underlying regulation of the anti-angiogenic forkhead transcription factor FoxO1 in cultured endothelial cells and ischemic muscle. Am. J Pathol. 2011 178(2):935-944.

Roudier E, Gineste C, Wazna A, Dehghan K, Desplanches D, **Birot O**. Angio-adaptation in unloaded skeletal muscle: new insights into an early and muscle type-specific dynamic process. J Physiol. 2010 Nov 15;588(Pt 22):4579-91.

Kishlyansky M, Vojnovic J, Roudier E, Gineste C, Decary S, Forn P, Bergeron R, Desplanches D, **Birot O**. Striated muscle angio-adaptation requires changes in Vasohibin-1 expression pattern. Biochem Biophys Res Commun. 2010 Aug 27;399(3):359-64

- **Enzo Cafarelli**

Gordon CS, Serino AS, Krause MP, Campbell JE, **Cafarelli E**, Adegoke OA, Hawke TJ, Riddell MC. Impaired growth and force production in skeletal muscles of young partially pancreatectomized rats: a model of adolescent type 1 diabetic myopathy? PLoS One. 2010 Nov 17;5(11):e14032.

- **Rolando Ceddia**

So M, Gaidhu MP, Maghdoori B, **Ceddia RB**. Analysis of time-dependent adaptations in whole-body energy balance in obesity induced by high-fat diet in rats. ***Lipids Health Dis***. 2011 Jun 16;10(1):99.

Andrade BM, Araujo RL, Perry RLS, Souza ECL, Carvalho DP, **Ceddia RB**. A novel role for AMP-kinase in the regulation of iodide uptake by the thyroid gland. ***Am J Physiol Cell Physiol***. 2011 Jun;300(6):C1291-7.

Gaidhu MP, **Ceddia RB.** The role of AMP-kinase in remodeling white adipose tissue metabolism. ***Exerc Sport Sci Rev*** 2011 Apr;39(2):102-8.

- **Imogen Coe**

Reyes G, Nivillac NM, Chalsev M, **Coe IR**. Analysis of recombinant tagged equilibrative nucleoside transporter 1 (ENT1) expressed in E. coli. Biochem Cell Biol. 2011 Apr;89(2):246-55.

Marvi M, Rose JB, Bang A, Moon BC, Pozeg Z, Ibrahim M, Peniston C, **Coe IR**. Nucleoside transporter expression profiles in human cardiac tissue show striking individual variability with overall predominance of hENT1. Eur J Pharm Sci. 2010 Dec 23;41(5):685-91.

Bone DB, Choi DS, **Coe IR**, Hammond JR. Nucleoside/nucleobase transport and metabolism by microvascular endothelial cells isolated from ENT1-/- mice. Am J Physiol Heart Circ Physiol. 2010 Sep;299(3):H847-56.

Reyes G, Naydenova Z, Abdulla P, Chalsev M, Villani A, Rose JB, Chaudary N, DeSouza L, Siu KW, **Coe IR**. Characterization of mammalian equilibrative nucleoside transporters (ENTs) by mass spectrometry. Protein Expr Purif. 2010 Sep;73(1):1-9.

- **Tara Haas**

Milkiewicz, M., E. Roudier, J.L. Doyle, A. Trifonova, O. Birot, **T.L. Haas**. Identification of a mechanism underlying regulation of the anti-angiogenic forkhead transcription factor FoxO1 in cultured endothelial cells and ischemic muscle. Am. J Pathol. 2011 178(2):935-944.

Unthank, J.L., **T.L. Haas** and S.J. Millar. Impact of shear level and cardiovascular risk factors on bioavailable nitric oxide and outward remodeling of mesenteric arteries. pp. 89-119 In "Arteriogenesis – Molecular regulation, pathophysiology and therapeutics I", E. Deindl and W. Schaper, Editors, Shaker Verlag Aachen, 2011.

Doyle, J.L. and **T.L. Haas**. The angiogenic response to skeletal muscle overload is not dependent on mast cell activation. Microcirculation 2010 Oct;17(7):548-56.

- **Mazen Hamadeh**

Solomon JA, Tarnopolsky MA, **Hamadeh MJ**. One universal common endpoint in mouse models of amyotrophic lateral sclerosis. PLoS ONE 2011 June 8;6:e20582.

Al-Sahab B, Adair L, **Hamadeh MJ**, Ardern C, Tamim H. Impact of breastfeeding duration on age at menarche. Am J Epidemiol 2011 May 1;173(9):971-7.

Al-Sahab B, **Hamadeh MJ**, Ardern C, Tamim H. Early menarche predicts incidence of asthma in early adulthood. Am J Epidemiol 2011 Jan 1;173(1):64-70.

Al-Sahab B, Ardern C, **Hamadeh MJ**, Tamim H. Age at menarche in Canada: results from the national longitudinal survey of children and youth. BMC Public Health 2010 Nov 28;10:736.

Moreira TS, **Hamadeh MJ**. The role of vitamin D deficiency and low calcium/dairy intake in the pathogenesis of type 2 diabetes mellitus. e-SPEN Eur e-J Clin Nutr Metab 2010 August;5:e155-e165.

- **Tom Hawke**

Lindinger MI, Leung M, Trajcevski KE, Hawke TJ. Volume regulation in mammalian skeletal muscle: the role of sodium-potassium-chloride cotransporters during exposure to hypertonic solutions. J Physiol. 2011 Jun 1;589(Pt 11):2887-99. Epub 2011 Apr 11.

Hawke TJ. T-cells and muscle just don't talk like they used to: focus on "Age-related impairment of T cell-induced skeletal muscle precursor cell function". Am J Physiol Cell Physiol. 2011 Jun;300(6):C1223-5

Gordon CS, Serino AS, Krause MP, Campbell JE, Cafarelli E, Adegoke OA, Hawke TJ, Riddell MC. Impaired growth and force production in skeletal muscles of young partially pancreatectomized rats: a model of adolescent type 1 diabetic myopathy? PLoS One. 2010 Nov 17;5(11):e14032.

Campbell JE, Peckett AJ, D'souza AM, Hawke TJ, Riddell MC. Adipogenic and lipolytic effects of chronic glucocorticoid exposure. Am J Physiol Cell Physiol. 2011 Jan;300(1):C198-209.

Krause MP, Riddell MC, Hawke TJ. Effects of type 1 diabetes mellitus on skeletal muscle: clinical observations and physiological mechanisms. Pediatr Diabetes. 2011 Jun;12(4 Pt 1):345-64.

- **David Hood**

Vainshtein, A., L. Kazak and D.A. Hood. Effects of endurance training on apoptotic susceptibility in striated muscle. J. Appl. Physiol. 110: 1638-45, 2011.

Menzies, K. and D.A. Hood. The role of SirT1 in muscle mitochondrial turnover. Mitochondrion 2011.

Nguyen, L M.-D. and D.A. Hood. Contractile activity-induced gene expression in fast-and slow-twitch muscle. Appl. Physiol. Nutr. Metab. 36:233-41, 2011.

Uguccioni, G. and D.A. Hood. The importance of PGC-1α in contractile activity-induced mitochondrial adaptations. Am. J. Physiol. Endocrinol. Metab. 300:E361-E371, 2011.

Singh, K. and D.A. Hood. Effect of denervation-induced muscle disuse on mitochondrial protein import. Am. J. Physiol. Cell Physiol. 300: C138-145, 2011.

Uguccioni, G., D. D'souza and D.A. Hood. Regulation of PPARγ coactivator-1α function and expression in muscle: effect of exercise. PPAR Res. pii: 937123. 2010.

Saleem, A., L. Kazak, M.O'Leary, and D.A. Hood. Muscle. In: J.C. Reed and D. Green D (Eds.) Apoptosis: Physiology and Pathology of Cell Death New York: Cambridge University Press, pp. 313-322, 2011.

- **John McDermott**

Chan CY, Masui O, Krakovska O, Belozerov VE, Voisin S, Ghanny S, Chen J, Moyez D, Zhu P, Evans KR, *McDermott JC, *Siu KW. Identification of differentially regulated secretome components during skeletal myogenesis. Mol Cell Proteomics. May;10(5):M110.004804, 2011 (* co-corresponding authors)

- **Michael Riddell**

JL Beaudry and **M.C. Riddell**. Stress and Pancreatic β Cell Function: Role of Glucocortoids, Exercise and Glucolipotoxicity. In: Beta Cells: Functions, Pathology and Research, Editor: Sarah E. Gallagher © 2010 Nova Science Publishers, Inc., ISBN: 978-1-61761-212-1.

H. Zisser, P. Gong, C. M. Kelley, J. S. Seidman, and **M. C. Riddell**. Exercise and Diabetes. The International Journal of Clinical Practise 2011 Feb 65 (Suppl. 170), 71–75.

Chu L, Hamilton J, **Riddell MC**. Clinical management of the physically active patient with type 1 diabetes. Phys Sportsmed. 2011 May;39(2):64-77.

Chu L, **Riddell MC**, Takken T, Timmons BW. Carbohydrate intake reduces fat oxidation during exercise in obese boys. Eur J Appl Physiol. 2011 Apr 6.

C.S. Gordon, T.J. Hawke, M.P. Krause, A.S. Serino, J.E. Campbell, E. Cafarelli, O.A.J Adegoke and **M.C. Riddell**. Impaired Growth and Force Production in Skeletal Muscles of Young Partially Pancreatectomized Rats: a Model of Adolescent Type 1 Diabetic Myopathy. PLoS One 2010 Nov 17;5(11):e14032.

J.I. Reddigan, C.I. Ardern, **M.C. Riddell** and J.L. Kuk. Differences in the Association between Clinically Relevant Classifications of Glycemia Measures and All-Cause and Cardiovascular Disease Mortality Risk. J Diabet Metabol 2010, 1:106

Campbell JE, Peckett AJ, D'souza AM, Hawke TJ, **Riddell MC**. Adipogenic and lipolytic effects of chronic glucocorticoid exposure. Am J Physiol Cell Physiol. 2011 Jan;300(1):C198-209.

J.L. Kuk, S. Davachi, A.M. Kriska, **M.C. Riddell**, E.W. Gregg. Pre-diabetes detection and intervention for high risk communities. Journal of Physical Activity and Health, 2010, 7(Suppl 3), S327-S340.

M.P. Krause, **M.C. Riddell** and T.J. Hawke. Effects of Type 1 Diabetes Mellitus on Skeletal Muscle: Clinical Observations and Physiological Mechanisms. Pediatr Diabetes. 2011 Jun;12(4 Pt 1):345-64.

A. Fuite, **M.C. Riddell** and V.R. Jamnik. Physical Activity and Medications; Important Considerations for Fitness and Exercise Professionals. Health and Fitness Journal of Canada 2010, 3(1): 31-38.

D. Kelly, J.E. Hamilton and **M.C. Riddell**. Blood glucose levels and performance in a sports camp for adolescents with type 1 diabetes mellitus: A field study. Int J Pediatr. 2010;2010. pii: 216167.

J.E. Campbell, M.A. Király, D. J. Atkinson, A.M. D'souza, M. Vranic and **M.C. Riddell**. Regular exercise prevents the development of hyperglucocorticoidemia via adaptations in the brain and adrenal glands in male Zucker diabetic fatty rats Am J Physiol Regul Integr Comp Physiol. 2010 Jul;299(1):R168-76.

Zisser H, **Riddell MC**. Exercise equipment and diabetes. Int J Clin Pract Suppl. 2010 Feb;(166):64-9. Review.

- **Anthony Scimè**

Scimè A, Soleimani V , Gillespie MA, LeGrand F, Grenier G, Bevilacqua L, Harper ME, and Rudnicki MA. (2010). Oxidative status of muscle is determined by p107 regulation of PGC-1α. Journal of Cell Biology. Aug 23;190(4):651-62.

- **Robert Tsushima**

Mihic A, Chauhan VS, Gao X, Oudit GY, **Tsushima RG**. Trafficking defect and proteasomal degradation contribute to the phenotype of a novel KCNH2 long QT syndrome mutation.
PLoS One. 2011 Mar 31;6(3):e18273.

Gonzalez R, Reingold BK, Gao X, Gaidhu MP, **Tsushima RG**, Unniappan S. Nesfatin-1 exerts a direct, glucose-dependent insulinotropic action on mouse islet â- and MIN6 cells. J Endocrinol. 2011 Mar;208(3):R9-R16.

Kang Y, Zhang Y, Liang T, Leung YM, Ng B, Xie H, Chang N, Chan J, Shyng SL, **Tsushima RG**, Gaisano HY. ATP modulates interaction of syntaxin-1A with sulfonylurea receptor 1 to regulate pancreatic beta-cell KATP channels. J Biol Chem. 2011 Feb 18;286(7):5876-83

Chao CC, Mihic A, **Tsushima RG**, Gaisano HY. SNARE protein regulation of cardiac potassium channels and atrial natriuretic factor secretion. J Mol Cell Cardiol. 2011 Mar;50(3):401-7.

Liang W, Oudit GY, Patel MM, Shah AM, Woodgett JR, **Tsushima RG**, Ward ME, Backx PH. Role of phosphoinositide 3-kinase (alpha), protein kinase C, and L-type Ca2+ channels in mediating the complex actions of angiotensin II on mouse cardiac contractility. Hypertension. 2010 Sep;56(3):422-9.

Appendix E: – List of Specialized Equipment

Olivier Birot

- Harvard Isoflurane anesthesia station
- Tissue lyser Retsch MM400 using stainless steel beads.
- Imaging station Kodak 4000MM Pro.

Rolando Ceddia

- Scintillation counter (Beckman Coulter LS 6500)
- Plate reader (Biotek Synergy HT)
- Temperature controlled spectrophotometer (Ultrospec 4300 Pro)
- Real Time - PCR (Biorad CFX96)

Mike Connor

- Kodak In Vivo FX Pro imaging station
- Hunter apparatus
- Cell culture electrical stimulator
- Ultracentrifuge
- Nanodrop spectrophotometer

Will Gage

- 7 camera optoelectronic motion capture system (Vicon)
- Six 6-degree of freedom force plates (AMTI)
- Wireless, 16 channel EMG data collection system (Noraxon)
- XY gantry for perturbing postural control and balance
- Wireless three-dimensional accelerometers for measuring movement "in the field"
- HUMAC isokinetic muscle strength testing system

Tara Haas

- Heraeus Table top centrifuge (up to 100 mL volumes)
- UV Crosslinker
- Hybridization Oven
- Shaking Water Bath
- Bacterial Incubator with shaking platform
- Bioptechs closed Flow Chamber for cultured cells
- FlexCell Fx4000 Cell Stretch Apparatus
- Gel Dryer
- Homogenizer
- MilliQ water purification
- Arcturus PixCell II Laser Capture Microdissection system

- Zeiss M200 Inverted Fluorescence microscope with Quantix57 Digital Cooled CCD imaging system and Metamorph image analysis software.

Mazen Hamadeh

- Microcentrifuge
- Mettler balance
- Equipment to run Western blots
- Electrophoresis apparatus
- PCR machine (Bio-Rad MyCycler)
- Spectrophotometer
- HPLC with -ve conductivity dectector

David Hood

- Real-time PCR system (Applied Biosystems)
- Kodak In Vivo Fx Pro Imaging System
- Cell culture facility
- Ultracentrifuge (Beckman)
- Flow Cytometer (non-sorting, BD)
- Small animal surgical facility
- Mitochondrial respirometer (Strathkelvin)
- Muscle contractile activity equipment
- Fluorescent plate reader
- Upright and inverted fluorescent microscopes
- Cryostat for muscle sectioning
- Rodent treadmills and activity wheels

Michael Riddell

- Rodent voluntary activity wheels and forced activity wheels
- Muscle stimulator and Power lab in situ muscle stimulation equipment
- Luminex multiplex
- Cryostat
- Metabolic cart-human
- Metabolic cages
- Tissue freeze dryer
- Paediatric cycle ergometer
- RT-PCR
- Spectrophotometer
- Plate reader
- Imaging station for in situ hybridization

Robert Tsushima

- 2 patch-clamp electrophysiology setups
- 2 isolated perfused heart systems
- Low speed tabletop centrifuge

- Beckman spectrophotometer
- Mitochondria respirometer (Strathkelvin)

Muscle Health Reseach Centre: 2011-2012 Budget	
Expenses	**2011-12**
Operating Expenses	
Director's Stipend and Benefits	6,427
Centre Coordinator Salary and Benefits (2 days/wk)*	6,000
Office/Computer Supplies	1,500
Telephone	1,200
Website Maintenance	1,200
Research, KT and Educational Expenses	
MHRC Faculty Research Awards	3,000
MHRC Student Scholarships	2,000
Muscle Health Awareness Day	4,000
Poster Prizes for Muscle Health Awareness Day (4x150)	600
Seminar series/KT	2,500
Invited Speakers (two per year - national and international)	3,000
York Muscle Health Research Student Awards at OEP	300
Total Expenses	**31,727**
Revenue	
Membership Fees (15 x $250)	3,750
Conference registration fees	1,500
Contribution from FSE	3,000
Contribution from Health	10,500
Costs covered by CRC	10,000
Total Revenue	**28,750**
Total Revenue Less Expenses	**(2,977)**
Carryforward From Previous Year	**48,182**
Carryforward to Next Year	**45,205**
Other Costs - Health	
Director's course release 1.5 FCE	27,127