

Muscle Health Research Centre Annual Report

July 1, 2011 - April 30, 2012

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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 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 & Engineering. Its intent is to become a renowned centre for muscle health research in North America.

2. Organizational Structure of the Unit

Executive Committee (elected for a 3 year term):

Director: David A. Hood

Faculty Members: Mike Connor, Olivier Birot (both Kinesiology and Health Science) and Robert Tsushima (Biology);

PhD student member: Sobia Iqbal.

Advisory Board: we do not have one

3. Membership List

Appendix A contains the list of the 15 active, 2 Adjunct and 1 Emeritus Faculty members of the MHRC in 2011-12. We added a new member this past year, Dr. Jennifur Kuk, who studies obesity, exercise body composition and health risk factors. 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 are very successful at obtaining NSERC, CIHR, Heart and Stroke Foundation and Canadian Diabetes Association research funding, at publishing our findings.

We held a successful Research Colloquium in the Fall of 2011, attended by approximately 70 faculty members and students. In addition, we brought in our first MHRC-sponsored external speakers in the Winter term, 2012. These were Dr. Vickie Baracos (University of Alberta) and Dr. Patrick Seale (University of Pennsylvania). They spoke on the topics of “Cancer Cachexia” and Brown Fat Gene Expression”, respectively, two topics that are very current in the literature on muscle health and metabolism. We are currently planning our most successful event of the year, the Muscle Health Awareness Day (MHAD). In May, this will represent our 3rd annual event of this kind continue to develop and expand the annual Muscle Health Awareness Day. Thus, we had a very successful year, and we continue to expand our functions and our outreach.

- Number of Collaborative grants between MHRC members: (3; See Appendix B).
- Number of collaborative peer-reviewed publications between MHRC members: (8, see Appendix D)

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

There are now 3 female faculty members and 1 female administrative assistant within 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 University Academic Plan.

6. Statement of Operations

Attached along with this document for 2011-12.

7. Budget for Current Fiscal Year

Attached along with this document for 2011-12.

8. Graduate Training Activities/Accomplishments

In its third full year of operation, the MHRC had 66 graduate student and trainees (50% male, 50% female):

Post-doctoral fellows: - 6

PhD students: – 13

MSc students: – 34

Undergraduate students: – 13

TOTAL current trainees: - 66

Alumni – 37

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.

Updated: May 15, 2012

Muscle Health Research Centre

Contact list

Faculty Member	Rank	Research Area	Office Number/ E-Mail	Office Location
School of Kinesiology and Health Science				
Hood, David	Professor, Canada Research Chair, Director of the 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	oadevoke@yorku.ca (416)736-2100 x 20887	Norman Bethune College, 362
Belcastro, Angelo	Professor, Chair, School of Kinesiology and Health Science	Muscle injury and damage in health and disease	anbelcas@yorku.ca (416)736-2100 x 21088	Norman Bethune College, 333B
Biro, Olivier	Assistant Professor	Vascular plasticity in striated muscle (angiogenesis vs. capillary regression)	birot@yorku.ca (416)736-2100 x 44043	Norman Bethune College, 353
Ceddia, Rolando	Associate Professor	Glucose and fat metabolism in muscle and adipose tissue	roceddia@yorku.ca (416)736-2100 x 77204	Lumbers Building, 225A
Connor, Michael	Associate Professor	Muscle Development and Cancer	mconnor@yorku.ca (416)736-2100 x 77206	Lumbers Building, 224
Gage, William	Associate Professor	Biomechanics of postural control and of joint stability	whgage@yorku.ca (416)736-2100 x 33027	Sherman Health Science Research Centre, 2022
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
Kuk, Jennifer L.	Assistant Professor	Obesity, CVD, Type 2 diabetes and exercise interventions	jennkuk@yorku.ca (416)736-2100 x 20080	Sherman Health Science Research Centre, 2002
Riddell, Michael	Associate Professor, KAHS Graduate Program Director	Exercise Physiology, Stress and Diabetes Metabolism	mriddell@yorku.ca (416)736-2100 x 40493	Norman Bethune College, 347
Scime, 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 Biology Graduate Program Director	Muscle Development	jmcdern@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

Adjunct Members

Cafarelli, Enzo (Emeritus)	Professor Emeritus	Neuromuscular Physiology	ecaf@yorku.ca	
Hawke, Thomas	Associate Professor	Muscle Development and Regeneration	hawke@mcmaster.ca	McMaster University
Jacobs, Ira	Dean, Faculty of Physical Education	Muscle Metabolism, Applied Physiology and Pharmacology	ira.jacobs@utoronto.ca	University of Toronto

MHRC Coordinator

Saleem, Ayesha (till June 2012)	Graduate Student		asaleem@yorku.ca X 77832	Farquharson Bldg, 342 X 22999 Fax: 416-650-8483
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**Appendix B: FUNDING RECEIVED or CONTINUING between
July, 1 2011 – April 30, 2012**

1. O. Adegoke

- NSERC Discovery Grant, 2008/2009 Competition: \$100000.00 over 5 years to study ‘Mechanism of nutritional regulation of protein metabolism in skeletal muscle’.

2. O. Birot

NSERC discovery grant (5 years)
France-Canada Research Fund (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. 2012: NSERC RTI; “Components to support a Spinning Disk Confocal Microscope” \$140,767.

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

New: NSERC Research Tools and Instrumentation; \$140,767 (Dr. Imogen Coe, PI +6 co-applicants)
Continuing:
2010 Heart and Stroke Foundation of Ontario; \$75,000/year (3 years);

2008 NSERC Discovery Grant (renewal); \$40,050/year (5 years).

8. D.A. Hood

- 2011-17 Canadian Institutes for Health Research (CIHR) Research Grant entitled "Autophagy in skeletal muscle" (103,661 per year). (New, July 1, 2011);
- 2008-12 Canadian Institutes for Health Research (CIHR) Research Grant entitled "Mitochondria in aging muscle" (106,000 per year);
- 2011-16 Natural Science and Engineering Research Council of Canada Discovery Grant entitled: "Mitochondrial Biogenesis in Skeletal Muscle" (\$110,000 per year). (Continuing);
- 2012 NSERC RTI grant: "Components to support a Spinning Disk Confocal Microscope" \$140,767 (co-applicant, PI: I. Coe).

9. M. Hamadeh

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).

10. J. Kuk

Project RADICAL: Race/ethnicity And the perception of Diabetes and cardiovascular disease risk factors In the context of CANADA's Lifestyle and obesity guidelines (2011-2012) - \$50,000 (Heart and Stroke Foundation - Principal Investigator)

11. J. McDermott

2012-2017 NSERC Discovery grant, \$175,000
Role of AP-1 in skeletal myogenesis

2012-2014 Heart and Stroke Foundation of Canada operating grant, \$180,000
Effects of β -blockers on cardiac gene expression

2010-2013 CIHR operating grant, \$375,000
Regulation of MEF2 by signalling pathways

2010-2013 Heart and Stroke Foundation of Canada operating grant, \$287,000
Regulation of Vascular Smooth Muscle Cells by MEF2 dependent signalling pathways

12. M. Riddell

Principle Investigator or Co-Principle Investigator (M Riddell):
(Total awarded= \$774,350)

1. MaRS Innovation MSCPoP Program Round 2. Treatment of hypoglycemia in Insulin-treated diabetes. Feb 2012 to Feb 2013- amount \$100,000 (with M Vranic).

2. Ministry of Health Promotion and Sport- Project Title: “Pre-Diabetes Detection and Physical Activity Intervention”- Phase IIIb April 1, 2011 to March 31, 2012- amount \$30,000 (with V Jamnik).
3. CIHR Proof of Principle Program - \$160, 000 (August 2011- December 2012) Phase I: Pharmaceutical intervention to decrease the threat of hypoglycemia in insulin-treated diabetics (with M. Vranic).
4. NSERC Discovery Grant (individual). \$190,000 (2007-2012), Project Title: Mechanisms of exercise training induced alterations in the hypothalamo-pituitary-adrenal axis.
5. Centre for Drug Research and Development (Pfizer CDRD Innovation Fund) with support from MaRS Innovation. Pharmaceutical intervention to decrease the threat of hypoglycemia in insulin-treated diabetics (Leaders M. Vranic, M. Riddell and D. Coy). \$294,350 (2011-2012).

External grants as co-applicant (M Riddell)
 (Total Awarded= 2,575,297)

1. 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. 2. CIHR Team Grant (Nutrition, Metabolism and Diabetes): Obesity and Related Diseases - 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. Operating Grant Title: CIHR Team in Childhood Obesity Research. 2008-05-01 to: 2013-04-30. 468,799 per year, (2,349,950 total).

13. A. Scimè

2012	NSERC- Discovery Grant	\$125,000 5 years
2012	Canadian Foundation for Innovation (CFI-LOI)	\$342,288

14. R. Tsushima

07.2009 – 06.2013	<i>SNARE Protein Regulation of Cardiac Ion Channels and ANF Secretion</i> Principal Investigator Heart and Stroke Foundation of Ontario (T6770) - \$409,181 (total)
07.2011 – 06.2014	<i>Role of Endogenous Cholesterol in Beta-Cell Stimulus-Secretion Coupling</i> Principal Investigator Canadian Diabetes Association (OG) - \$274,725 (total)
01.2012 – 12.2013	<i>In Vivo Imaging of Cardiovascular Function</i> Principal Investigator: Robert Tsushima Leaders Opportunity Fund Canadian Foundation for Innovation - \$350,720

Appendix C: AWARDS RECEIVED between July, 1 2011 – April 30, 2012

J. Kuk

Laboratory Equipment Scientist of the Week (2011)

R. Tsushima

2009.07 – 2014.06 Career Investigator Award
Heart and Stroke Foundation of Ontario – \$438,750

Appendix D: PUBMED-listed publications by MHRC Faculty members between July, 1 2011 – April 30, 2012

- **Olasunkanmi Adegoke**

Olasunkanmi A.J. Adegoke, Abdikarim Abdullahi, Pegah Tavajohi-Fini. mTORC1 and the regulation of skeletal muscle anabolism and mass. *Applied Physiology, Nutrition, and Metabolism*, 2012, 37(3): 395-406, 10.1139/h2012-009

Serino AS, **Adegoke OA**, Zargar S, Gordon CS, Szigiato AA, Hawke TJ, Riddell MC. Voluntary physical activity and leucine correct impairments in muscle protein synthesis in partially pancreatectomised rats. *Diabetologia*. 2011 Dec;54(12):3111-20. *senior authorship shared between Adegoke OA, Riddell MC*

- **Olivier Birot**

Delghingaro-Augusto V, D'Acary S, Peyot ML, Latour MG, Lamontagne J, Paradis-Isler N, Lacharite-Lemieux M, Akakpo H, **Birot O**, Nolan CJ, Prentki M, Bergeron R. Voluntary running exercise prevents β -cell failure in susceptible islets of the Zucker diabetic fatty rat. *Am J Physiol Endocrinol Metab*. 2012 Jan;302(2):E254-64. Epub 2011 Nov 1.

Birot O. Genetic background, endurance performance and muscle capillarization: lessons from the 'mini mice'. *Exp Physiol*. 2011 Nov;96(11):1116-7. No abstract available.

- **Rolando Ceddia**

Souza RP, Tiwari AK, Chowdhury NI, **Ceddia RB**, Lieberman JA, Meltzer HY, Kennedy JL, Müller DJ. Association study between variants of AMP-activated protein kinase catalytic and regulatory subunit genes with antipsychotic-induced weight gain. *J Psychiatr Res* 46(4):462-8, 2012.

Ceddia RB. Motilin beyond gut motility: A novel role in the regulation of adipose tissue metabolism. *Am J Physiol Endocrinol Metab* 301(5):E756-7, 2011.

Gonzalez R, Perry RLS, Gao X, Gaidhu MP, Tsushima RG, **Ceddia RB**, Unniappan S, Nutrient Responsive Nesfatin-1 Regulates Energy Balance and Induces Glucose-Stimulated Insulin Secretion in Rats. *Endocrinology* 152(10):3628-37, 2011.

Gaidhu MP, Frontini A, Hung S, Pistor K, Cinti S, **Ceddia RB.** Chronic AMP-kinase activation with AICAR reduces adiposity by remodeling adipocyte metabolism and increasing leptin sensitivity. *J Lipid Res* 52(9):1702-11, 2011.

- **Imogen Coe**

Grenz, A., Bauerle, J.D., Dalton, J.H., Ridyard, D., Badulak, A., Tak, E., McNamee, E.N., Clambey, E., Moldovan, R., Reyes, G., Klawitter, J., Ambler, K., Magee, K., Christians, U., Brodsky, K.S., Ravid, K., Choi, D.-S., Wen, J., Lukashev, D., Blackburn, M.R., Osswald, H., **Coe, I.R.**, Nürnberg, B., Haase, V.H., Xia, Y., Sitkovsky, M., and Eltzschig, H.K. 2012. Equilibrative nucleoside transporter ENT1 regulates post-ischemic blood-flow during acute kidney injury in mice. *Journal of Clinical Investigation*, 122(2):693-710

Rose, J., Naydenova, Z., Bang, A., Ramadan, A., Klawitter, J., Schram, K., Sweeney, G., Grenz, A., Eltzschig, H., Hammond, J., Choi, D-S., and **Coe, I.R.** 2011. Absence of equilibrative nucleoside transporter 1 in ENT1 knockout mice leads to altered nucleoside levels following hypoxic challenge. *Life Sciences*. 89(17-18):621-30

Reyes, G, Nivillac, NMI, Karim, M.Z., DeSouza, L, Siu, K.W.M., and **Coe, IR.** 2011. The Equilibrative Nucleoside Transporter 1 (ENT1) is a phosphoprotein. *Molecular Membrane Biology*, 28(6):412-26

Nivillac, NMI, Bacani, J, and **Coe, IR.** 2011. The life cycle of the human equilibrative nucleoside transporter 1: From ER export to degradation. *Experimental Cell Research* 317(11):1567-79.

- **Tara Haas**

Kobus, K, J. Kopycińska, A. Kozłowska-Wiechowska, E. Urasinska, P. Milkiewicz, A. Kempinska-Podhorodecka, T.L. Haas, M. Milkiewicz. Angiogenesis within the duodenum of patients with cirrhosis is modulated by mechanosensitive Kruppel-like factor 2 and microRNA-126. *Liver Int.* 2012 May 10

Gorman, J.L., E. Ispanovic and T.L. Haas. Regulation of Matrix Metalloproteinase Expression. *Drug Discovery Today: Disease Models* 2011 8(1):5-11

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.

- **Will Gage**

Vergara ME, O'Shea FB, Inman RD, GAGE WH. (2012). Postural control is altered in patients with ankylosing spondylitis. Clinical Biomechanics.,27(4),334-40.

Maki BE, Sibley KM, Jaglal SB, Bayley M, Brooks D, Fernie GF, Flint GF, GAGE WH, Liu BA, McIlroy WE, Mihailidis A, Perry SD, Popovic MR, Pratt J, Zettel JR. (2011). Reducing fall risk by improving balance control: Development, evaluation and knowledge-translation of new approaches. Journal of Safety Research.,42(6),473-85.

Tung JY, GAGE WH, Zabjek KF, Fernie GR, McIlroy WE. (2011). Frontal plane standing balance with an ambulation aid: Upper limb biomechanics. Journal of Biomechanics.,14(8),1466-70.

- **Mazen Hamadeh**

Ma X, **Hamadeh MJ**, Christie BR, Foster JA, Tarnopolsky MA. Impact of treadmill running and sex on hippocampal neurogenesis in the mouse model of amyotrophic lateral sclerosis. PLoS One 2012;7(4):e36048. doi:10.1371/journal.pone.0036048

Al-Sahab B, Ardern C, **Hamadeh MJ**, Tamim H. Age at menarche and current substance use among Canadian adolescent girls: Results of a cross-sectional study. BMC Public Health 2012;12:195. doi:10.1186/1471-2458-12-195

Solomon JA, Gianforcaro A, **Hamadeh MJ**. Vitamin D3 deficiency differentially affects functional and disease outcomes in the G93A mouse model of amyotrophic lateral sclerosis. PLoS ONE 2011;6:e29354. doi:10.1371/journal.pone.0029354

Solomon JA, Tarnopolsky MA, **Hamadeh MJ**. One universal common endpoint in mouse models of amyotrophic lateral sclerosis. PLoS ONE 2011;6:e20582. doi:10.1371/journal.pone.0020582

- **David Hood**

Menzies, K.J., B. Chabi, **D.A. Hood**, S. Schenk, A. Philp, V.A. Braga and D.D. Guimaraes. Commentaries on Viewpoint: Does SIRT1 determine exercise-induced skeletal muscle mitochondrial biogenesis: differences between in vitro and in vivo experiments? J. Appl. Physiol. 112:929-30, 2012.

Joseph, A.M., D.R. Joannis, R.G. Baillot, and **D.A. Hood**. Mitochondrial dysregulation in the pathogenesis of diabetes: potential for mitochondrial biogenesis-mediated interventions. Exp Diabetes Res. Epub ahead of print. 2012.

Joseph, A.M., and **D.A. Hood**. Plasticity of TOM complex assembly in skeletal muscle mitochondria in response to chronic contractile activity. Mitochondrion. 12:305-12, 2012.

Menzies, K. and **D.A. Hood**. The role of SirT1 in muscle mitochondrial turnover. Mitochondrion 12: 5-13, 2012.

Saleem A., H.N. Carter, S. Iqbal, and **D.A. Hood**. Role of p53 within the regulatory network controlling muscle mitochondrial biogenesis. Exerc Sport Sci Rev. 39:199-205, 2011.

Hood, D.A., G. Uguccioni, A. Vainshtein and D. D'souza. Mechanisms of exercise-induced mitochondrial biogenesis in skeletal muscle: implications for health and disease. Compr. Physiol. 1: 1119-1134, 2011 (July).

Hood, D.A., M.F.N. O'Leary, G. Uguccioni and I. Irrcher. Metabolic Systems: Mitochondrial Mitochondrial Biogenesis induced by Endurance Training. Farrell, P.A., M.J. Joyner and V.J. Caiozzo (Eds). ACSM Graduate Textbook of Exercise Physiology. Baltimore: Lippincott, Williams and Wilkens Chapter 18, pp. 447-465, 2012.

Hood, D.A. and K. Singh. Mitochondrial Biogenesis. In: Mooren, F.C. and J.S. Skinner (Eds) Encyclopedia of Exercise Medicine and Disease. Heidelberg: Springer Verlag, (in press, 2011).

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.

- **Jennifer Kuk**

Kowal C, Kuk J, Tamim H: Characteristics of Weight Gain in Pregnancy Among Canadian Women (Maternal and Child Health Journal – Apr 16(3): 668-676, 2012).

Reddigan JI, Riddell MC and Kuk JL: Physical activity level is as critical as glycemic control in predicting cardiovascular death and all cause mortality in the US population (Diabetologia –Mar;55(3):632-5, 2012).

Taing K, Ardern CI, Kuk JL: Effect of the Timing of Weight Cycling and Weight Variability During Adulthood on Mortality Risk in Women (Obesity – Feb: 20(2): 407-413, 2012).

Wharton S, VanderLelie S, Sharma AM, Sharma S, Kuk JL: The short term effectiveness of a medically supervised, interdisciplinary program for obesity management in a Canadian setting (Canadian Family Physicians – Jan;58(1):e32-8, 2012).

Sharma S, Wharton S, Forhan M, Kuk JL: Influence of weight discrimination on weight loss goals and self-selected weight loss interventions (Clinical Obesity – Dec 1: 153-160, 2011).

Reddigan JI, Ardern CI, Riddell MC and Kuk JL: Physical activity and cardiovascular disease mortality: The influence of cardiometabolic risk factors (Am J Cardiology –Nov; 15;108(10):1426-31, 2011).

Kuk JL, Ardern CI, Church TS, Sharma AM, Padwal R, Sui X and Blair SN: Edmonton Obesity Staging System: Association with Weight History and Mortality Risk (APNM – Aug;36(4):570-6, 2011).

- **John McDermott**

Salma J, McDermott JC. Suppression of a MEF2-KLF6 Survival Pathway by PKA Signaling Promotes Apoptosis in Embryonic Hippocampal Neurons. *J Neurosci*. 2012 Feb 22;32(8):2790-803.

Pagiatakis C, Gordon JW, Ehyai S, McDermott JC. A novel RhoA/ROCK- CPI-17 -MEF2C signaling pathway regulates vascular smooth muscle cell gene expression. *J Biol Chem*. 2012 Jan 23. [Epub ahead of print]

Miyake T, McDermott JC, Gramolini AO. A method for the direct identification of differentiating muscle cells by a fluorescent mitochondrial dye. *PLoS One*. 2011;6(12).

Chan CY, McDermott JC, Siu KW. Secretome Analysis of Skeletal Myogenesis Using SILAC and Shotgun Proteomics. *Int J Proteomics*. 2011;2011:329467.

Chan CY, Masui O, Krakovska O, Belozarov 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*.(5):M110.004804, 2011 (* co-corresponding authors)

- **Michael Riddell**

M.C. Riddell. Chapter 2: The Impact of Type 1 Diabetes on the Physiological Responses to Exercise. In *Type 1 Diabetes: Clinical Management of the Athlete*. Editor I. Gallen, Springer; 2012 edition (Mar 16 2012). ISBN-10: 0857297538.

M.C. Riddell. "Diabetes Mellitus, Juvenile" in the *Encyclopedia of Exercise Medicine in Health and Disease*. Editor: Frank C. Mooren, Springer, 2012 ISBN 978-3-540-36065-0.

A.E. Peckett, B.W. Timmons and **M.C. Riddell**. The interaction of exercise, stress, and inflammation on growth. In *The Handbook of Growth and Growth Monitoring in Health and Disease*. Section: Exercise and Growth in Children and Adolescents Editor: V.R. Preedy. Springer, 2012. ISBN 978-1-4419-1794-2.

H. Zisser, M. Sueyoshi, K. Krigstein, A. Szigiato and **M.C. Riddell**. *Advances in Exercise, Physical Activity and Diabetes Mellitus. Yearbook of Advanced Technology and Treatments in Diabetes*. ATTD Yearbook, Editors: M. Phillip, T. Battalino. Wiley Press, Feb 2012.

D'souza AM, Beaudry JL, Szigiato AA, Trumble SJ, Snook LA, Bonen A, Giacca A, **Riddell MC**. Consumption of a high-fat diet rapidly exacerbates the development of fatty liver disease that occurs with chronically elevated glucocorticoids. *Am J Physiol Gastrointest Liver Physiol*. 2012 Apr;302(8):G850-63. Epub 2012 Jan 19. PubMed PMID: 22268100.

Yardley JE, Kenny GP, Perkins BA, **Riddell MC**, Malcolm J, Boulay P, Khandwala F, Sigal RJ. Effects of performing resistance exercise before versus after aerobic exercise on glycemia in type 1

diabetes. *Diabetes Care*. 2012 Apr;35(4):669-75. Epub 2012 Feb 28. PubMed PMID: 22374639; PubMed Central PMCID: PMC3308306.

Burr JF, Shephard RJ, **Riddell MC**. Prediabetes and type 2 diabetes mellitus: assessing risks for physical activity clearance and prescription. *Can Fam Physician*. 2012 Mar;58(3):280-4. PubMed PMID: 22518899; PubMed Central PMCID: PMC3303651.

Reddigan JI, **Riddell MC**, Kuk JL. The joint association of physical activity and glycaemic control in predicting cardiovascular death and all-cause mortality in the US population. *Diabetologia*. 2012 Mar;55(3):632-5. Epub 2011 Nov 13. PubMed PMID: 22080254. NOTE: FRONT COVER ILLUSTRATION and EDITORS CHOICE.

Shpilberg Y, Beaudry JL, D'Souza A, Campbell JE, Peckett A, **Riddell MC**. A rodent model of rapid-onset diabetes induced by glucocorticoids and high-fat feeding. *Dis Model Mech*. 2012 Jan 25. [Epub ahead of print] PubMed PMID: 22184636.

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- **Anthony Scimè**

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- **Robert Tsushima**

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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
- Biopetechs 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)

STATEMENT OF OPERATIONS

Fund Code: 200 Cost Centre: 157001 FH-Muscle Health Reseach Ctre

For the Period Ended: 30-Apr-12

Run Date/Time: 5/24/2012 2:34:25 PM

Start Date: 7/1/2008 End Date: 12/31/2099

Fiscal Year: 2012

Manager: Verrilli, Mary

Cost Centre Status: ACTIVE HST Rebate Rate: 73%

Location: Health, Nurs & Envir Stud Bldg

Department: 53850 HH-Office of the Dean

Current Month Actual	Account Description	Account#	Annual Budget	Current YTD			Budget to YTD Total Var	% Remaining	Prior YTD
				Actual	Commitment	Total (Act+Commit)			Total
Revenue									
-	ECR Registration Fees	045000	3,500.00	-	-	-	(3,500.00)	0%	3,250.00
-	ECR Conf-Registr-Fees	050305	1,500.00	1,630.00	-	1,630.00	130.00	9%	8,488.00
Total External Cost Recoveries			5,000.00	1,630.00	-	1,630.00	(3,370.00)	0%	11,738.00
-	ICR Donations & Grants	034040	3,000.00	3,000.00	-	3,000.00	-	0%	3,000.00
Total Internal Cost Recoveries			3,000.00	3,000.00	-	3,000.00	-	0%	3,000.00
-	OTO Trsf within F/D F200 CC Ra	099912	10,500.00	10,500.00	-	10,500.00	-	0%	32,240.00
Total OTO Budget Allocations			10,500.00	10,500.00	-	10,500.00	-	0%	32,240.00
Total Central Allocations			10,500.00	10,500.00	-	10,500.00	-	0%	32,240.00
Total Revenue			18,500.00	15,130.00	-	15,130.00	(3,370.00)	0%	46,978.00
Expenses									
446.33	Admin Stipend Yufa	113000	5,356.00	5,355.96	-	5,355.96	0.04	0%	5,355.96
446.33	Total Faculty - Admin Salaries		5,356.00	5,355.96	-	5,355.96	0.04	0%	5,355.96
89.27	Ben Admin Stipend Yufa	213000	1,071.00	1,071.24	-	1,071.24	(0.24)	0%	1,071.24
89.27	Total Faculty - Admin Benefits		1,071.00	1,071.24	-	1,071.24	(0.24)	0%	1,071.24
535.60	Total Fac Admin Salary & Benefits		6,427.00	6,427.20	-	6,427.20	(0.20)	0%	6,427.20
-	Asst'Shp-Ft Yk Grad Stud - Can	194001	7,200.00	-	-	-	7,200.00	100%	2,000.00
-	GuestLecturers&Honoraria NYork	195001	1,300.00	850.00	-	850.00	450.00	35%	300.00
Total Research Staff - Salaries			8,500.00	850.00	-	850.00	7,650.00	90%	2,300.00
-	Ben Guest Lecturers- employees	295000	-	-	-	-	-	0%	31.50
Total Research Staff - Benefits			-	-	-	-	-	0%	31.50
Total Res Staff Salary & Benefits			8,500.00	850.00	-	850.00	7,650.00	90%	2,331.50
535.60	Total Total Salaries and Benefits		14,927.00	7,277.20	-	7,277.20	7,649.80	51%	8,758.70
-	Repair & Maintenance-Building	431000	100.00	-	-	-	100.00	100%	71.79
-	Alterations	439000	-	-	-	-	-	0%	20.21
-	Cleaning Services	451000	-	53.76	-	53.76	(53.76)	0%	-

STATEMENT OF OPERATIONS

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Start Date: 7/1/2008 **End Date:** 12/31/2099
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For the Period Ended: 30-Apr-12
Fiscal Year: 2012

Run Date/Time: 5/24/2012 2:34:25 PM
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Location: Health, Nurs & Envir Stud Bldg
Department: 53850 HH-Office of the Dean

Current Month Actual	Account Description	Account#	Annual Budget	Current YTD			Budget to YTD Total Var	% Remaining	Prior YTD
				Actual	Commitment	Total (Act+Commit)			Total
Expenses									
-	Total Equipment, Furniture, & Bldgs		100.00	53.76	-	53.76	46.24	46%	92.00
-	L.D./Telegrams	332000	25.00	-	-	-	25.00	100%	2.83
-	Pay-At-Bank Charges	370700	-	15.00	-	15.00	(15.00)	0%	-
-	Minor Research Grants	382500	-	2,850.00	-	2,850.00	(2,850.00)	0%	-
-	Total Other Expenses		25.00	2,865.00	-	2,865.00	(2,840.00)	0%	2.83
-	Hotel Expense-Faculty	401300	-	-	-	-	-	0%	1,415.24
-	Travel-General-Other	402500	-	718.44	-	718.44	(718.44)	0%	-
713.15	Visiting Speakers-Travel -Gen	405000	3,000.00	1,941.85	-	1,941.85	1,058.15	35%	-
-	Functions - Campus	406000	5,000.00	1,276.44	-	1,276.44	3,723.56	74%	2,841.63
294.40	Hospitality - Campus	406200	1,500.00	2,245.54	-	2,245.54	(745.54)	0%	1,392.55
1,007.55	Total Travel & Hospitality		9,500.00	6,182.27	-	6,182.27	3,317.73	35%	5,649.42
-	Office Supplies Gen	301000	3,000.00	187.64	-	187.64	2,812.36	94%	3,706.42
435.00	Teach.&Res Gen Sup	305000	3,000.00	(2,178.36)	-	(2,178.36)	5,178.36	173%	2,626.47
-	Audio-Visual	305300	-	25.00	-	25.00	(25.00)	0%	-
-	Printing And Photocopy Gen	320900	-	2,232.07	-	2,232.07	(2,232.07)	0%	-
435.00	Total Supplies-Comprehensive&General		6,000.00	266.35	-	266.35	5,733.65	96%	6,332.89
1,442.55	Total Operating Costs		15,625.00	9,367.38	-	9,367.38	6,257.62	40%	12,077.14
198.30	Telephone Equip Rental-Telecom	467000	1,200.00	1,189.80	-	1,189.80	10.20	1%	1,189.80
198.30	Total Telephone & Power		1,200.00	1,189.80	-	1,189.80	10.20	1%	1,189.80
198.30	Total Taxes and Utilities		1,200.00	1,189.80	-	1,189.80	10.20	1%	1,189.80
-	Scholarships - Pay Off	802000	-	1,000.00	-	1,000.00	(1,000.00)	0%	-
-	Total Scholarships & Bursaries		-	1,000.00	-	1,000.00	(1,000.00)	0%	-
2,176.45	Total Expenses		31,752.00	18,834.38	-	18,834.38	12,917.62	41%	22,025.64

STATEMENT OF OPERATIONS

Fund Code: 200 **Cost Centre:** 157001 FH-Muscle Health Reseach Ctre
Start Date: 7/1/2008 **End Date:** 12/31/2099
Cost Centre Status: ACTIVE **HST Rebate Rate:** 73 %

For the Period Ended: 30-Apr-12
Fiscal Year: 2012

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Location: Health, Nurs & Envir Stud Bldg
Department: 53850 HH-Office of the Dean

Current Month Actual	Account Description	Account#	Annual Budget	Current YTD			Budget to YTD Total Var	% Remaining	Prior YTD
				Actual	Commitment	Total (Act+Commit)			Total
(2,176.45)	Surplus/ (Deficit) Current Year		(13,252.00)	(3,704.38)	-	(3,704.38) (1)	9,547.62	0%	24,952.36
				Employee Advances					
						- (2)			
				Carry Forward from Previous Year					
						55,601.47 (3)			
				Balance Available (Overspent)					
						51,897.09 (4) = (1-2+3)			

Muscle Health Research Centre: 2012-2013 Budget	
Expenses	2012-13
Operating Expenses	
Director's Stipend and Benefits	6,428
Centre Coordinator Salary and Benefits (2 days/wk)*	6,000
Office/Computer Supplies	1,500
Telephone	1,200
Research, KT and Training Expenses	
Research Supplies	1,000
MHRC Faculty Research Awards	3,000
MHRC Student Scholarships	2,000
Muscle Health Awareness Day	2,000
Poster Prizes and Guest Speaker Honoraria	1,850
Travel for visiting speakers	3,600
Hospitality for events, meetings, visitors	3,000
Printing costs	1,500
Total Expenses	33,078
Revenue	
Membership Fees (15 x \$250)	3,500
Conference registration fees	1,500
Contribution from FSE	3,000
Contribution from Health	10,500
Costs covered by CRC	10,000
Total Revenue	28,500
Total Revenue Less Expenses	(4,578)
Carryforward From Previous Year	51,897
Carryforward to Next Year	47,319
Other Costs - Health	
Approximate cost of Director's course release 1.5 FCE	27,900