



Diabetes Research Envisioned and Accomplished in Manitoba (DREAM) Theme

Manitoba Institute of Child Health

ANNUAL REPORT

November 22, 2013

Submitted by:

**Dr. Grant M. Hatch & Dr. Jon McGavock
Co-Directors of DREAM**

History of DREAM

The DREAM theme was established 2011, and began formal operations April 1st, 2012.

VISION

To improve the health of children with diabetes by making clinically relevant discoveries that will serve as the foundation for strategies to improve diagnosis, prevention and management of complications related to obesity and diabetes.

LOCATION OF DREAM

DREAM is located on the 5th and 6th floors of the John Buhler Research Centre within the Manitoba Institute of Child Health.

SUB-THEMES

Within the DREAM framework there are three research subthemes;

1. Developmental Origins of Health and Disease (DOHaD) – Heather Dean MD
2. Cardio-Renal Complications – Elizabeth Sellers, MD, MSc
3. Treatment Approaches. – Vern Dolinsky PhD

PROGRESS IN 2013

CLINICAL EPIDEMIOLOGY CORE

To facilitate the productivity of our clinician scientists, one of the long-term goals for the DREAM Theme is to create a metabolic core within the Clinical Research Unit that consists of core staff trained in diabetes and metabolic assessments. Our vision is for the use DREAM core funding to support 20-50% salaries for these positions with the remainder provided through individual researcher grants. This year we made significant progress towards accomplishing this goal as we recruited and retained a research nurse (Eileen Bouw), sonographer (Marissa Dingman) and part time research assistant (Sherri-Lynn Wigham). Over the next 12 months we hope to increase the nurse position to a 1.0 FTE and hire one more research assistant to support the growing demand for individuals trained in clinical studies.

ADVISORY GROUP

The majority of the youth treated for type 2 diabetes in the Children's Hospital are First Nations, Metis or Inuit. In an effort to comply with guidelines for participatory action research and ensure that the research we are doing is tailored to the needs of Aboriginal families, Dr. Heather Dean assembled a group of Aboriginal stakeholders, health care providers and scientists to advise the Developmental Origins sub-theme. This year this advisory group accepted our request to be the formal community advisory group for the entire DREAM Theme. This group will advise on research questions, knowledge translation activities and provide approval for research related to diabetes in Aboriginal youth.

RECRUITMENT OF NEW SCIENTISTS

One of our long-term goals is to expand our research team to increase expertise in specific areas. This year we recruited Dr. Paul Fernyhough to the core DREAM group. Dr. Fernyhough is one of Canada's leading basic scientists in the area of diabetic neuropathy. His research group has extensive funding from CIHR and JDRF to develop unravel the mechanisms involved in diabetic neuropathy and develop novel compounds to prevent it. Paul's work is very complimentary to the clinical research studies led by Dr. Elizabeth Sellers. Paul is working closely with Dr. Vern Dolinsky to study the developmental origins of diabetic neuropathy and his expertise and leadership will fill a major gap in our complications sub-theme.

TRAINING OF HIGHLY QUALIFIED PERSONNEL

In an effort to promote interdisciplinary experiences for our trainees, Dr. Christine Doucette has spearheaded a journal club for trainees. The journal club is held every other Wednesday for 1 hour and all students from across the university are invited to attend. We would like to formally create a DREAM student group (potentially named DREAM-Catchers) that will work with the Biology of Breathing student group, to develop priorities for trainees and develop their own research day. The journal club is attended by DREAM directors and investigators, providing students with access to experts on the team and opportunities to interact with clinicians, basic scientists and epidemiologists.

CURRENT MEMBERSHIP

Dr. Grant Hatch	Co-Director, DREAM, Professor Pharmacology and Therapeutics, Biochemistry and Medical Genetics
Dr. Jon McGavock	Co-Director, DREAM, Assistant Professor, Department of Pediatrics and Child Health

Dr. Tom Blydt-Hansen	Associate Professor, Pediatric Nephrologist
Dr. Alison Dart	Assistant Professor, Pediatric Nephrologist
Dr. Jim Davie	Professor, Scientific Director, MICB
Dr. Heather Dean	Professor, Pediatric Endocrinologist
Dr. Vern Dolinsky	Assistant Professor, Department of Pharmacology and Therapeutics
Dr. Christine Doucette	Assistant Professor, Department of Physiology
Dr. Paul Fernyhough	Professor, Pharmacology / Neurodegenerative Diseases
Dr. Joe Gordon	Assistant Professor, Faculty of Nursing
Dr. Elizabeth Sellers	Associate Professor, Pediatric Endocrinologist
Dr. Geert tJong	Clinical Pharmacologist, Medical Leader, CRU
Dr. Brandy Wicklow	Assistant Professor, Pediatric Endocrinologist
Dr. Kristy Wittmeier	Physiotherapist,
Non Faculty Members	
Erika Bloomfield	Research Coordinator
Eileen Bouw	Research Nurse

INFRASTRUCTURE

Each member of DREAM has his/her independent research program and is expected to secure extramural funding and other infrastructural support to conduct his/her research studies. DREAM is designed to support core staff, facilities and equipment for research related to type 2 diabetes carried out by core members. DREAM also serves as a communal resource to support the research activities of ancillary members, the University of Manitoba and other institutions. The various scientific programs of DREAM also serve as catalysts to facilitate research collaboration and exchange of expertise between members internal and external to the University.

MANAGEMENT OF DREAM AND BUSINESS MEETINGS

The DREAM Theme conducts monthly scientific and business meetings with all core members. The Management Committee of the DREAM, consisting of Drs. Hatch and McGavock, and sub theme leaders are responsible for the general operation of DREAM. The day-to-day operation of DREAM is currently carried out by the theme co-directors and the DREAM coordinator, Erika Bloomfield.

RESEARCH SUPPORT

Support for development of DREAM was based initially on a \$675,000 investment (2012-2014) provided by the Manitoba Institute of Child Health (MICH).

\$175,000 in 2012

\$250,000 in 2013

\$250,000 in 2014

Each member of DREAM has his/her own departmental affiliation, research laboratory, research grants and research personnel to support his/her research program. Research support currently held by members of DREAM includes grants from:

- Canadian Institutes of Health Research (CIHR)
- Canadian Cancer Society
- Heart and Stroke Foundation of Canada
- Canadian Foundation for Innovation (CFI)
- Canadian Diabetes Association (CDA)
- Manitoba Health Research Council (MHRC)
- Lawson Foundation
- NSERC

Collectively, theme members secured 24 operating, equipment and salary awards totalling over \$9 million in research funding (>\$3 million annually) in 2013 (see attached table below). Initial Sub-theme seed grant funding (~\$120,000) offered to theme members from the 2013 proposal were leveraged and led to 7 successful grant applications totalling ~\$1.2 million. Dr. Jon McGavock and Dr. Vern Dolinsky (\$242,000/3yrs) secured a 3 year award from the Heart and Stroke Foundation of Canada. Dr Vern Dolinsky secured an MHRC establishment grant (\$100,000 /3 years), Dr. Joe Gordon secured 3 operating grants and Dr. McGavock secured 2 CIHR grants.

CORE EQUIPMENT AND INFRASTRUCTURE

Core Equipment used by researchers

- Spectrophotometer
- basic light microscope
- dissecting microscope
- electrophoresis equipment
- microcentrifuge
- waterbath
- homogenizer
- Scintillation Counter
- Seahorse XF analyzer
- Gas Chromatograph
- Ultracentrifuge
- High Speed Centrifuge
- Real Time PCR Unit
- Thin Layer Chromatography Units
- Fluorescent Microscope
- Laminar Flow Hood
- Fume Hood
- Cell culture biosafety cabinet and incubator
- Sorvall centrifuge
- AB bioscience real-time thermocycler
- Next Generation sequencing platform and equipment
- Nanodrop

Research Techniques used:

- Immunoblotting
- Gene expression (quantitative PCR)
- molecular biology (plasmid purification/transfection)
- tissue culture
- protein purification
- histology
- immunohistochemistry
- immunofluorescence
- animal work (rodent- GTT/ITT etc)
- in vivo ultrasound imaging (echocardiography)
- Molecular cloning
- Mammalian cell culture, including skeletal, cardiac, and vascular smooth muscle cells
- Real-time PCR
- Western blots
- Fluorescence and confocal microscopy, include mitochondrial morphology, vital dyes, immunofluorescence, protein trafficking
- Absorbance- and fluorescence-based plater reader assays, including cell viability assays
- Promoter-driven reporter assays

Clinical Epidemiology Core

- Non-Invasive Imaging Suite
- Body Composition: Dual X-Ray Absorptiometry
- Vascular Function: Atcor Sphygmocor CPVH System
- Cardiac Function: GE Vivid I Portable Ultrasound with EchoPac Software
- Heidelberg Corneal Confocal Microscopy
- 3-Tesla Magnetic Resonance Imaging and Spectroscopy (External sites)
- Research Nurse (0.5 FTE)
- Research Sonographer (0.25 FTE)

Exercise Physiology Core

- Parvomedics Metabolic Cart
- Monark 828 E Cycle Ergometer
- Noramco ST4600 Treadmill
- Actical accelerometers

Risk factor Monitoring

- Spacelabs ambulatory blood pressure monitors
- Iohexol-derived glomerular filtration rate

SCIENTIFIC MEETINGS

The DREAM Theme held its first Symposium on the role of Mitochondria in Health and Disease in November 2012. A brief report from that meeting was added to the 2012 annual report.

We have also attached feedback from the first symposium for the board to review.

The DREAM Theme will host its second annual Symposium on November 21, 2013 entitled: Interventions to Prevent and Treat Type 2 Diabetes. Please see attached program.

The keynote speakers at the symposium include:

- Dr. Bruce Verchere, University of British Columbia
- Dr. Phil Zeitler, University of Colorado
- Dr. Patrick Schrauwen, Maastricht University

Local speakers include:

- Dr. Peter Jones
- Dr. Jon McGavock
- Dr. Paul Fernyhough
- Hana Vakili
- Dr. Vern Dolinsky
- Dr. Harold Aukema

REPORT OF EXPENDITURES

The DREAM Theme reports to MICH with its yearly expenditure. An account at MICH has been set up by through Nichola Wigle for this purpose. Drs. Hatch and McGavock have signing authority on this account. These funds have been used exclusively for the research activities of DREAM.

COLLABORATIONS AND NETWORKING

DREAM has begun to develop active collaborations with other research groups within the Faculty of Medicine and colleagues elsewhere.

OTHER ACTIVITIES

Dr. Heather Dean has established a Community Advisory Panel (CAP) under the DREAM subtheme of DOHaD Developmental Origins of Health and Disease. The CAP was established to provide community stakeholders with information on the activities of DREAM and to provide DREAM with a CAP as an essential component of CIHR's Strategy for Patient Oriented Research (SPOR) Network.

FINANCIAL PROGRESS REPORT

Expenditures in 2013 were very close to the projected budget, submitted to the board in 2012. Slight modifications included the purchase of a large piece of equipment to study diabetes-related neuropathy using funds that were set aside for equipment maintenance and the symposium. Costs for the symposium were taken from the core budget and from a small grant awarded to DREAM from Jim Davie. The majority of the budget was spent on core staff including research assistants, nurses and a sonographer. Seed grant funding was provided to each sub-theme and separate reports will be completed by sub-theme leaders and submitted at a later date.

DREAM Budget Report 2013

	Projected Budget Year 2013	Actual Year 2013
REVENUES		
MICH/CHF	\$ 249,400.00	\$250,000.00
Total Revenues		
EXPENDITURES		
<u>Salaries:</u>		
Research Co-ordinator	\$ 30,000.00	\$ 6,000.00
Nursing Support		\$ 7,000.00
Imaging Technician		\$ 5,000.00
Research Support - Clinical		\$ 19,000.00
Research Assistant - Basic	\$ 70,000.00	\$ 30,000.00
Research Assistant - Mitochondrial Platform**		\$ 15,000.00
Symposium		\$ 6,500.00
Seahorse**		\$ 11,500.00
TOTAL		\$ 100,000.00
<u>Small Grant</u>		
Small Grant (DT-SM13-01)		
Small Grant (DT-SM13-02)		
Small Grant (DT-SM13-03)		
<u>Operating Grant</u>		
Development Grant (DT-DV13-01)	\$ 40,000.00	\$ 40,000.00
Development Grant (DT-DV13-02)	\$ 40,000.00	\$ 25,000.00
Development Grant (DT-DV13-03)	\$ 40,000.00	\$ 40,000.00
Hold over for Resveratrol Trial**		\$ 15,000.00
TOTAL		\$ 120,000.00
<u>Project Costs:</u>		
Administration:	\$ 10,000.00	\$ 10,000.00
Monthly meetings	\$ 2,400.00	\$ -
Annual Symposium:	\$ 7,000.00	\$ -
<u>Equipment</u>		
Equipment Maintenance	\$ 10,000.00	\$ -
Equipment Purchase** - Animal Neuropathy Equip		\$ 20,000.00
Total Expenses	\$ 249,400.00	\$ 250,000.00

2014 BUDGET

The budget structure for 2014 is identical to that of 2012 and 2013 with some minor modifications to the allotment of funds within each area. With the purchase of the seahorse in 2013, we would like to contribute to the salary for a full-time technician to operate and maintain the equipment. We will also provide slightly less support for key positions within the theme, but invest in more core staff. Similar to 2013, core staff will include a clinical research nurse, sonographer and DREAM theme coordinator. In 2014 however we will also contribute to staff for new investigators working on pre-clinical studies and the iCARE cohort. We will also continue to provide small seed grants for pilot data and host a third DREAM symposium.

Budget Proposal for DREAM for 2014

Expenditure	Unit Cost	#/year	Total
1. OPERATING			
Research Coordinator	\$60,000.00	0.4	\$25,000.00
Nursing and imaging tech	\$100,000.00	0.2	\$20,000.00
RA Mitochondrial	\$70,000.00	0.5	\$35,000.00
RA Basic Science	\$80,000.00	0.5	\$40,000.00
RA iCare	\$60,000.00	0.3	\$20,000.00
Sub-Total			\$140,000.00
*2. Developmental Operating Grants	\$30,000.00	3	\$90,000.00
3. MEETINGS			
Annual symposium	\$7,400.00	1	\$7,400.00
Monthly meetings	\$200.00	12	\$2,400.00
Sub-Total			\$10,000.00
4. ADMINISTRATION			
Group leader stipends	\$5,000.00	2	\$10,000.00
Sub-Total			\$10,000.00
CORE STAFF/MAINTENANCE			\$140,000.00
SMALL GRANTS			\$90,000.00
MEETINGS			\$10,000.00
ADMINISTRATION			\$10,000.00
TOTAL REQUEST			\$250,000.00

PRODUCTIVITY

Total Extramural Funding Secured in 2012 = \$4,007,320

Total Extramural Funding Secured in 2013 = \$9,138,770

Member	Agency	Amount	Duration	Funding/yr	Type
Blydt-Hansen, Co-I**	CIHR	\$14,270,000	2013-2018	\$2,854,000	Program Grant
Blydt-Hansen, Co-PI	Transplant Manitoba-Ped. Kidney Program	\$26,500	2013-2014		Operating
Dart, PI	MMSF	\$20,000	2013	\$20,000	Operating
Dart/McGavock Co-PIs	CIHR	\$25,000	2013-2014	\$25,000	Meetings
Davie, PI	CIHR	\$100,000	2013	\$100,000	Catalyst
Davie, PI	CIHR	\$1,372,800	2013-2018	\$274,560	Team Grant
McGavock/ Dolinsky Co-PI	Heart & Stroke Foundation	\$227,668	2013-16	\$75,890	Operating
Dolinsky, PI	MHRC	100,000	2013-2016	\$33,333	Establishment
Dolinsky, PI	CFI	\$583,595			Infrastructure
Doucette, PI	Thorlakson Foundation Fund	\$29,950	2013-2014	\$29,950	
Fernyhough, PI	CIHR	\$943,639	2013-2018	\$188,728	Operating
Fernyhough, Co-PI	NIHR	\$1,785,000	2013-2018	\$357,000	Operating
Fernyhough, Co-PI	CIHR	\$611,905	2013-2018	\$122,381	Operating
Gordon, PI	NSERC	\$160,000	2013-2017	\$40,000	Discovery Grant
Gordon, PI	MMSF/MICH	\$20,000	2013	\$20,000	Operating
Gordon, PI	U of M	\$7,500	2013	\$7,500	Operating
Hatch PI	CRC	\$1,400,000	2013-2020	\$200,000	Research Chair
McGavock, Co-PI	CIHR	\$455,000	2013-2016	\$151,666	Operating
McGavock, Co-PI	CIHR	\$322,000	2013-2015	\$161,000	RPP
McGavock Co-I	CIHR	\$895,000	2013-2016	\$298,333	Operating
Sellers, PI	MICH	\$39,437	2013	\$39,437	Operating
Wittmeier, Co-PI**	CIHR	\$20,000,000	2013-2018	\$4,000,000	Support Unit Funding
Wittmeier, PI	HSC Allied Health Research	\$10,289.51	2013-2014	\$5,144.76	Operating
Wittmeier, PI	School of Med Rehab Endowment Fund	\$3,486	2013	\$3,486	Operating
TOTALS	GRANTS	AMOUNT		AMOUNT/YR	
2012	17	\$4,007,320		\$1,117,000	
2013	24	\$9,138,770		\$3,046,257	

**** Programmatic funding, unrelated to DREAM secured by members of the team are not included when calculating the annual summary of funds**

Total Publications in 2012 = 74

Total Publications in 2013 = 90

Publications

Blydt-Hansen, Tom (7)

1. Furth S, Ng D, Hidalgo G, Warady B, Moxey-Mims M, Blydt-Hansen T, Minnick MG, Munoz A. "Income Level and Kidney Disease Severity and Progression Among Children With CKD: A Report From the Chronic Kidney Disease in Children (CKiD) Study". 2013. In Press.
2. Phan V, Blydt-Hansen T, Feber J, STOPP consortium. Skeletal findings in the first 12 months following initiation of glucocorticoid therapy for pediatric nephrotic syndrome. Jul 2013. In Press.
3. Samuel S, Morgan CJ, Martin B, Mammen C, Dart AB, Manns BJ, Alexander RT, Erickson RL, Grisar S, Wade AW, Blydt-Hansen TD, Feber J, Arora S, Licht C, Zappitelli M. Substantial practice variation exists in Canada in the management of childhood nephrotic syndrome. May 1, 2013. In Press.
4. Wiebe C, Pochinco D, Blydt-Hansen T, Ho J, Birk P, Karpinski M, Goldberg A, Storsley L, Gibson I, Rush D, Nickerson P. Class II HLA Epitope Matching - A strategy to minimize de novo donor specific antibody development and improve outcomes. In Press.
5. Caligiuri S, Dunthorn K, Gauthier J, Taylor C, Blydt-Hansen T, Zahradka P. "Dietary linoleic acid and 945;-linolenic acid differentially affect renal oxylipins and phospholipid fatty acids in diet-induced obese rats". Jun 26, 2013. In Press.
6. Lugase T, Achille M, Blydt-Hansen T, Clermont MJ, Geoffroy L, Legault L, Phan V, Bell LE. Assessment of Identity and Quality of Life in Diabetic and Renal Transplant Adolescents in Comparison to Healthy Adolescents. May 4, 2013.
7. Smith JM, Martz K, Blydt-Hansen TD. Pediatric kidney transplant practice patterns and outcome benchmarks, 1987–2010: A report of the North American Pediatric Renal Trials and Collaborative Studies. *Pediatr Transplant*. 2013 Jan 2. doi: 10.1111/petr.12034. [Epub ahead of print].

Dart, Alison (6)

1. Dart AB, Martens PJ, Rigatto C, Brownell MD, Dean HJ, Sellers EA, "Earlier onset of complications in youth with type 2 diabetes.", *Diabetes care*, PubMed ID: 24130346
2. Samuel S, Morgan CJ, Bitzan M, Mammen C, Dart AB, Manns BJ, Alexander RT, Erickson RL, Grisar S, Wade AW, Blydt-Hansen T, Feber J, Arora S, Licht C, Zappitelli M, "Substantial practice variation exists in the management of childhood nephrotic syndrome.", *Pediatric nephrology (Berlin, Germany)* PubMed ID: 23917450
3. Mutter TC, Ruth CA, Dart AB, "Hydroxyethyl starch (HES) versus other fluid therapies: effects on kidney function.", *The Cochrane database of systematic reviews*, 7 PubMed ID: 23881659
4. Ho J, Dart A, Rigatto C, "Proteomics in acute kidney injury-current status and future promise.", *Pediatric nephrology (Berlin, Germany)*. PubMed ID: 23595423
5. Sood, M, Manns, B, Dart, A, Hiebert, B, Komenda, P, Molzahn, A, Naimark, D, Nessim, S, Rigatto, C, Soroka, S, Zappitelli, M, Tangri, N, "Geographical and regional variation in the use of peritoneal dialysis in Canada: A cohort study." *Open Canadian Medical Association Journal* (accepted)
6. Witt, S, Bullard, J, Dart AB, "Analysis of resistance patterns changes practice for children on peritoneal dialysis", *Peritoneal Dialysis International* (submitted)

Davie, Jim (10)

1. Healy, S, Khan, P. and Davie, J.R. (2013) Immediate early response genes and cell transformation. *Pharmacol Ther* 137, 64-77.
2. Delcuve, G.P., Khan, D.H., and Davie, J.R. (2013) Targeting class I histone deacetylases in cancer therapy. *Exp Opin Ther Targets* 17, 29-41.
3. He, S., Khan, D.H., Winter, S., Seiser, C., and Davie, J.R. (2013) Dynamic distribution of HDAC1 and HDAC2 during mitosis: association with F-actin. *J Cell Physiol* 228, 1525-35.
4. Thompson, L.L., Guppy, B.J., Sawchuk, L., Davie, J.R., and McManus, K.J. (2013) Regulation of chromatin structure via histone post-translational modification and the link to carcinogenesis. *Cancer and Metastasis Reviews* in press.
5. Khan, P., Drohic, B., Pérez-Cadahía, B., Healy, S. and Davie, J.R. (2013) Mitogen- and stress-activated protein kinases 1 and 2 are required for maximal trefoil factor 1 induction. *PLoS One* 13;8(5):e63189.
6. Dilshad, K. and Davie, J.R. (2013) Histone deacetylase inhibitors block the nucleosomal response and induction of immediate early genes. *FEBS Lett.* 587, 1510-7.
7. Khan, D.S., He, S., Yu, J., Winter, S., Seiser, C. and Davie, J.R. (2013) Protein kinase CK2 regulates the dimerization of HDAC1 and HDAC2 during mitosis. *J. Biol. Chem.* 288, 16518-28.
8. Xu, W., Banerji, S., Davie, J.R., Kassie, F., Yee, D, and Kratzke, R. (2013) Yin Yang gene expression ratio signature for lung cancer prognosis. *PLoS One* 8(7):e68742.
9. Gang, H., Shaw, J., Dhingra, R., Davie, J.R., and Kirshenbaum, L.A. (2013) Epigenetic regulation of canonical TNF α pathway by HDAC1 determines survival of cardiac myocytes. *Am J Physiol Heart Circ Physiol.* 304, H1662-9
10. Khan, D.H., Gonzalez, C., Cooper, C., Sun, J.M., Chen, H.Y., Healy, S., Xu, W., Smith, K.T., Workman, J.L., Leygue, E., and Davie, J.R. (2013) RNA-dependent dynamic histone acetylation regulates MSL1 alternative splicing. *Nucleic Acids Res.*, in press.

Dean, Heather (9)

1. Hui A, Ludwig S, Gardiner P, Sevenhuysen G, Dean H, Sellers E, Morris M, Bruce S, Murray R, Shen G. Exercise and Dietary Intervention During Pregnancy Results in Reduced Excessive Gestational Weight Gain. *Obstet Gynecol* (submitted).
2. Millar K, Sellers EAC, McGavock JM, Dean HJ. The Next Generation Cohort: Obesity and Type 2 Diabetes in Offspring of Parents with Pediatric-Onset Type 2 Diabetes. *Developmental Origins of Health and Disease* (submitted).
3. Israels SJ, McNicol HJ, Cognasse F, Sellers EAC, Dean HJ. Markers of Platelet Activation in Adolescents with Diabetes Mellitus. *Diabetes Care* (submitted).
4. Ball B, Sellers E, Wicklow B, Dean H. Diabetes Guidelines. *Diabetes Guidelines. CMAJ* 2013:
5. Eskicioglu P., Halas J., Senechal M., Wood L., McKay E., Villeneuve S., Shen G., Dean H., McGavock J. The Aboriginal Youth Mentorship Program (AYMP): Peer mentoring for Type 2 Diabetes Prevention in First Nations children living in a northern isolated setting. (submitted).

6. McGavock J., Hay J., Wittmeier K., MacIntosh A., Wicklow B., Duhamel T., Sellers E., Dean H., Ready E., Berard L., Kriellaars D., Gardiner P. Physical Activity Intensity and Diabetes Risk in Overweight Youth: The POWER Trial. JAMA (submitted)
7. Dart A., Martens P., Rigatto C., Brownell M., Dean H., Sellers E. Earlier onset of complications in youth with type 2 diabetes. Diabetes Care (in press)
8. Rempel JD, Packiasamy J, Dean HJ, McGavock J, Janke A, Collister M, Wicklow B, Sellers EA. Preliminary analysis of immune activation in early onset type 2 diabetes. Int J Circumpolar Health. 2013 Aug 5;72.
9. Sellers EA , Clark I , Tavakoli M , Dean HJ , McGavock J , Malik RA, "The acceptability and feasibility of corneal confocal microscopy to detect early diabetic neuropathy in children: a pilot study.", Diabetic medicine : a journal of the British Diabetic Association

Dolinsky, Vern (4)

1. DOLINSKY, V. W., Rogan, K.J., Sung, M.M., Zordoky, B.N., Haykowsky, M.J., Young, M.E., Jones, L.W. and Dyck, J.R.B. Both aerobic exercise and resveratrol supplementation attenuate doxorubicin-induced cardiac injury in mice. Am. J. Physiol. Endo. Metab. (2013) 305: E243-253.
2. DOLINSKY V.W., Chakrabarti, S., Pereira, T.J., Oka, T., Levasseur, J., Beker, D., Zordoky, B.N., Morton, J.S., Nagendran, J., Lopaschuk, G.D., Davidge, S.T. and Dyck, J.R.B. Resveratrol prevents hypertension and cardiac hypertrophy in hypertensive rodents. Biochim. Biophys. Acta (2013) 1832: 1723-1733.
3. Bosse, J., Lin, H., Sloan, C., Zhang, Q.-J., Abel, E.D., Pereira, T.J., DOLINSKY V.W., Symons, J.D. and Jalili, T. A low carbohydrate – high fat diet reduces blood pressure in spontaneously hypertensive rats without deleterious changes in insulin resistance. Am. J. Physiol. Heart Circ. Physiol. (2013) 304: H1733-1742.
4. Lauzier, B., Vaillant, F., Merlen, C., Gelinat, R., Bouchard, B., Daneault, C., Robillard Frayne, I., Allen, B., Labarthe, F., DOLINSKY, V., Dyck, J.R., Chatham, J.C. and DesRosiers C. Metabolic effects of glutamine on the heart: Anaplerosis versus the hexosamine biosynthetic pathway. J. Mol. Cell Cardiol. (2013) 55: 92-100.

Doucette, Christine (2)

1. Allister EM , Robson-Doucette CA , Prentice KJ , Hardy AB , Sultan S , Gaisano HY , Kong D , Gilon P , Herrera PL , Lowell BB , Wheeler MB, "UCP2 Regulates the Glucagon Response to Fasting and Starvation.", Diabetes, 62(5)
2. Mailloux RJ , Fu A , Robson-Doucette C , Allister EM , Wheeler MB , Sreaton R , Harper ME, "Glutathionylation state of uncoupling protein-2 and the control of glucose-stimulated insulin secretion.", The Journal of biological chemistry,287(47)

Fernyhough, Paul (6)

1. *Saleh, A., Roy Chowdhury, S.K., Smith, D. R., Balakrishnan, S., Tessler, L., Martens, C., Morrow, D., Frizzi, K., Calcutt, N.A. and P. Fernyhough (2013). Ciliary neurotrophic factor activates NF- κ B to enhance mitochondrial bioenergetics and prevent neuropathy in sensory neurons of streptozotocin-induced diabetic rodents. Neuropharmacology. 65, 65-73. (if, 4.81)

2. Alandijany, T., Kammouni, W., Roy Chowdhury, S.K., Fernyhough, P., and A. C. Jackson (2013). Mitochondrial dysfunction in rabies virus infection of neurons. *Journal of NeuroVirology*. In Press.
3. *Saleh, A., Smith, D.R., Tessier, L., Martens, C., Mateo, A.R., Schartner, E., Van Der Ploeg, R., Toth, C., Zochodne, D.W. and P. Fernyhough (2013). Receptor for advanced glycation end-products (RAGE) activates divergent signaling pathways to augment neurite outgrowth of adult sensory neurons. *Experimental Neurology*. 249, 149-159. (if, 4.7)
4. Purohit, M.K., Vanampalli, C., Hadimani, M., Van der Ploeg, R., Morrow, D., Arballo, V., Frizzi, K.E., Calcutt, N.A., Fernyhough, P. and L.P. Kotra (2013). Guaifenesin derivatives promote neurite outgrowth and protect diabetic mice from neuropathy. *Journal of Medicinal Chemistry*. 56, 5071-5080. (if, 5.6)
5. *Roy Chowdhury, S.K., Smith, D.R. and P. Fernyhough (2013). The role of aberrant mitochondrial bioenergetics in diabetic neuropathy. *Neurobiology of Disease*. 51, 56-65. (if, 5.12)
6. Saleh, A., Schapansky, J., Smith, D.R., Young, N., Odero, G., Aulston, B., Fernyhough, P. and G. W. Glazner (2013). Normalization of NF- κ B activity in dorsal root ganglia neurons cultured from diabetic rats reverses neuropathy-linked markers of cellular pathology. *Experimental Neurology*. 241, 169-178. (if, 4.7)

Hatch, Grant (12)

1. On, N., Mitchell, R.W., Savant, S.D., Bachmeier, C.J., HATCH, G.M. and Miller, D.W. (2013) Examination of Blood-Brain Barrier (BBB) Integrity In A Mouse Brain Tumor Model. *J. Neuro-Oncology* 111, 133-143.
2. Chang, W., Zhang, M., Li, J., Meng, Z., Wei, S., Du, H., Chen, L. and HATCH, G.M. (2013) Berberine improves insulin resistance in cardiomyocytes via activation of 5'-adenosine monophosphate-activated protein kinase. *Metabol. Clin. Expt.* 62, 1159-1167.
3. Elliott, A.M., Simard, L.R., Coghlan, G., Chudley, A.E., Chodirker, B.N., Greenberg, C.R., Burch, T., Ly, V., HATCH, G.M. and Zelinski, T. (2013) A Novel Mutation in KIAA0196: Identification of a Gene Involved in Ritscher-Schinzel/3C Syndrome in a First Nations Community. *J. Med. Gen.* 50, 819-822.
4. Shulga, Y.U., Loukov, D., Ivanova, P.T., Milne, S.B., Myers, D.S., HATCH, G.M., Umeh, G., Fullerton, M.D., Steinberg, G.R., Topham, M.K., Brown, H.A., and Epand, R.M. (2013) Diacylglycerol Kinase Delta Promotes Lipogenesis in Adipocytes By Regulating Fatty Acid Synthesis. *Biochemistry (USA)* 52, 7766-7776.
5. Mejia, E., Nguyen, H., HATCH, G.M. (2013) Mammalian cardiolipin biosynthesis. *Chem. Phys. Lipids* [Epub ahead of print] Oct 19. doi:pii: S0009-3084(13)00129-1.
6. Chang, W., Zhang, M., Li, J., Meng, Z., Wei, S., Du, H., Chen, L. and HATCH, G.M. (2013) Compound K protects pancreatic B-cells against apoptosis through inhibition of the AMPK/JNK pathway in type 2 diabetic mice and in MIN6 B-cell. (in revision).
7. Chowdhury, K.K., Ming, Z., Legare, D. J., HATCH, G.M., Wang, H., Lautt, W.W. (2013) Fatty Liver & Heart vs. Prediabetic Insulin Resistance & Cardiac Dysfunction Which is Cause or Consequence? *Expt. Gerontol.* (submitted).

8. Zhaojie, M., Ming, Z., Shengnan, W., Xiaojia, B., HATCH, G.M., Jingkai G. ,and Li, C. (2013). : Amorphous solid dispersion of berberine with absorption enhancer demonstrates a remarkable hypoglycemic effect via improving its bioavailability. Intl. J. Pharmaceutics (submitted).
9. Dalvi, D., Mitchel, R.W., Aukema, H.M, Miller, D.W. and HATCH, G.M. (2013) Exogenous arachidonic acid mediates permeability of human brain microvessel endothelial cells. J. Neurochem. (in revision).
10. Lia, H., Haoa, M., Bachua, J., Xu, F.Y., Taylor, W., HATCH, G.M., Rempel, C.B. (2013) J. Amer. Oil Chem. (submitted).

Book Chapters

1. Mejia, E.A., Dolinsky, V.W. and HATCH, G.M. (2013) Role of phospholipases in regulation of cardiolipin biosynthesis and remodelling in the heart and mammalian cells. In: *Phospholipases in Health and Disease*, (Tappia, P., Dhalla, N. eds.) Springer, (*in press*).
2. Nguyen, H., Dalvi, S., On, N., Pogorzelec, M., Miller, D.W. and HATCH, G.M. (2013) The blood brain barrier: Regulation of fatty acid and drug transport. *Neurochemistry 2cd ed.* (*submitted*).

McGavock, Jon (23)

Submitted

1. Saad V, Wicklow B, Wittmeier K, Hay J, MacIntosh A, Ryner L, Berard L, McGavock J. A practical algorithm to predict hepatic steatosis in obese youth. *Pediatrics*
2. Hobin E, Comte M, Manske S, Casey C, Murnaghan D, McGavock JM. Manitoba Increases Physical Activity in Secondary Students (MIPASS). Study Design and Baseline Results. Submitted to *BMC Pediatrics*.
3. Mollard R, Senechal M, Wicklow B, Hay J, Wittmeier K, MacIntosh A, Venopal, N, Berard L, McGavock J. Dietary determinants of hepatic steatosis in overweight youth. *Am. J Clin. Nutrition*.
4. Protudjer J, Dumontet J, McGavock J. My Voice: The lived experience of youth with type 2 diabetes. *Diabetes Care*
5. Senechal M, McGuire D, Gore O, McGavock J. Is fitness associated with cardiomyopathy in the setting of type 2 diabetes? *JCEM*.
6. Eskicioglu P, Senechal M, Wood L, McKay E, Halas J, McGavock JM. The Aboriginal Youth Mentorship Program: A model of health promotion in remote First Nations Communities. *Pediatrics*. In 2nd review
7. Schaefer L, Plotnikoff R, Majumdar S, Torrance B, Downs S, Rinaldi R, Ball GD, Veugelers P, Boule N, Wozny P, McCargar L, Lewanczuk R, McGavock JM. Its 3:30pm do you know where your child is? Outdoor time as a determinant of physical activity in children. Submitted to *J. Pediatrics*.
8. MacMillan F, Yardley J, Hay J, Wittmeier K, Wicklow B, MacIntosh A, McGavock J. The blood pressure response to exercise in youth with type 2 diabetes. *Journal of Pediatrics*.
9. MacIntosh A, Mollard R, Rinaldi R, Torrance B, Ball GD, Majumdar S, Plotnikoff R, Veugelers P, Boule N, Wozny P, McCargar L, Downs S, Lewanczuk R, McGavock JM. Is physical activity associated with remission to healthy weight status in obese youth? *J. Pediatrics*.

10. Comte M, Hobin H, Manske S, Casey C, Murnaghan D, McGavock JM. Physical activity levels in adolescents exposed to a province wide physical education policy. Submitted to *J Physical Activity and Health*. 2nd Review
11. Wicklow BA, Griffith A, Dumontet J, Venupaul N, Ryner LN, McGavock JM. Pancreatic triglyceride content is not associated with beta cell dysfunction in youth-onset type 2 diabetes. *JCEM*.

Published or in Press

1. Senechal M, McGavock J, Church T, Lee D, Earnest CP, Sui X, Blair S. Cut-Points of Muscle Strength Associated with Metabolic Syndrome in Men in the Aerobics Center Longitudinal Study. Submitted to *Medicine Sci Sports Exer*. Accepted August 2013.
2. Yardley J, Mollard R, MacMillan F, MacIntosh A, Wicklow B, Hurd C, Berard L, McGavock J. The importance of vigorous intensity physical activity for metabolic control in type 1 diabetes. *Can. J Diabetes*. Accepted August 2013
3. Durksen A, Mollard R, Downs S, Rinaldi R, Torrance B, Ball GD, Majumdar S, Plotnikoff R, Veugelers P, Boule N, Wozny P, McCargar L, Lewanczuk R, McGavock JM. Vigorous and not moderate or light physical activity is independently associated with cardiometabolic risk in youths. Submitted to *J of Phys Act. Health*. Accepted August 2013
4. Hobin E, So, J, Rosella L, Comte M, McGavock, J, Manske S. Trajectories of objectively measured physical activity among secondary students in Canada in the context of a province-wide physical education policy: a longitudinal analysis. *Journal of Obesity*. IF 2.95. Accepted
5. Santos RG, Durksen A, Rabanni R, Chanoine JP, Lamboo-Miln A, Mayer T, McGavock JM. Healthy Buddies© Manitoba: A Cluster Randomised Controlled Effectiveness Trial of Peer-Based Healthy Living Lesson Plans on Body Weight and Physical Activity in Elementary School Students. In Press *JAMA Pediatrics*. April 2013. IF 4.1
6. Carson V, Maximova K, Rinaldi R, Torrance B, Ball GD, Majumdar S, Plotnikoff R, Veugelers P, Boule N, Wozny P, McCargar L, Downs S, Lewanczuk R, McGavock JM. Vigorous intensity physical activity and cardiometabolic risk – A prospective cohort study. In Press. *Int. J of Obesity*. June 2013 IF 5.1
7. Senechal M., Hay J, Wicklow B, Eskicioglu P, McGavock J. Fitness is not associated with metabolically healthy obesity in adolescents. *Pediatrics*. In Press. IF 5.1
8. Sellers EA, Clark I, Tavakoli M, Dean HJ, McGavock J, Malik RA. The acceptability and feasibility of corneal confocal microscopy to detect early diabetic neuropathy in children: a pilot study. *Diabet Med*. 2013 Jan 16. IF 3.2
9. Forbes L, Downs S, Fraser S, Majumdar S, Plotnikoff R, Ball G, Wozny P, Torrance B, Lewanczuk R, McGavock J, McCargar L. Dietary and Physical Activity Diabetes Risk Factors and Insulin Sensitivity Among Alberta Adolescents. The Healthy Hearts Cohort Study. *Applied Physiology Nutrition and Metabolism*. In Press
10. S  n  chal M , Wicklow B , Wittmeier K , Hay J , Macintosh AC , Eskicioglu P , Venugopal N , McGavock JM. Cardiorespiratory Fitness and Adiposity in Metabolically Healthy Overweight and Obese Youth. *Pediatrics* (2013).
11. Millar K, Sellers EAC, McGavock JM, Dean HJ. The Next Generation Cohort: Obesity and Type 2 Diabetes in Offspring of Parents with Pediatric-Onset Type 2 Diabetes. *Developmental Origins of Health and Disease* (submitted).

12. Rempel JD, Packiasamy J, Dean HJ, McGavock J, Janke A, Collister M, Wicklow B, Sellers EA. Preliminary analysis of immune activation in early onset type 2 diabetes. *Int J Circumpolar Health*. 2013 Aug 5;72.
13. Vander Ploeg K, Maximova K, McGavock J, Veugelers P. The effects of APPLE Schools on physical activity levels in youth. Submitted to *Pediatrics*. July 2013.

Sellers, Elizabeth (8)

1. Rempel JD, Packiasamy J, Dean HJ, McGavock J, Janke A, Collister M, Wicklow BA, Sellers EAC, "Preliminary analysis of immune activation in early onset type 2 diabetes", *Int J Circumpolar Health*, 72 PubMed ID: 23984303
2. Gross ML, Tenenbein M, Sellers EAC, "Severe vitamin D deficiency in 6 Canadian First Nation formula-fed infants", *Int J Circumpolar Health*, 72 PubMed ID: 23599910
3. Ball BW , Sellers EA , Wicklow BA , Dean HJ, "A Canadian diabetes risk calculator: should it fit all populations?", *CMAJ : Canadian Medical Association journal* 185(3) PubMed ID: 23423274
4. Sellers EA , Clark I , Tavakoli M , Dean HJ , McGavock J , Malik RA, "The acceptability and feasibility of corneal confocal microscopy to detect early diabetic neuropathy in children: a pilot study.", *Diabetic medicine : a journal of the British Diabetic Association* PubMed ID: 23323870
5. Dart AB , Martens PJ , Rigatto C , Brownell MD , Dean HJ , Sellers EA, "Earlier onset of complications in youth with type 2 diabetes.", *Diabetes care*, PudMed ID: 24130346
6. Millar K, Sellers EAC, McGavock JM, Dean HJ. The Next Generation Cohort: Obesity and Type 2 Diabetes in Offspring of Parents with Pediatric-Onset Type 2 Diabetes. *Developmental Origins of Health and Disease* (submitted).
7. Hui A, Ludwig S, Gardiner P, Sevenhuysen G, Dean H, Sellers E, Morris M, Bruce S, Murray R, Shen G. Exercise and Dietary Intervention During Pregnancy Results in Reduced Excessive Gestational Weight Gain. *Obstet Gynecol* (submitted).
8. Schroth RJ, Levi JA, Sellers EA, Friel J, Kliwer E, Moffatt ME. Vitamin D status of children with severe early childhood caries: a case--control study. *BMC Pediatr*. 2013 Oct 25;13(1):174

tJong, Geert (1)

1. Tanoshima R , 't Jong GW , Merlocco A , Simpson J , Friedman JN , Colantonio D , Koren G
A child exposed to primidone not prescribed for her. (2013) *Therapeutic drug monitoring* 35 2 2013. PubMed ID: 23503440

Wicklow, Brandy (5)

1. Sénéchal M , Wicklow B , Wittmeier K , Hay J , Macintosh AC , Eskicioglu P , Venugopal N , McGavock JM. Cardiorespiratory Fitness and Adiposity in Metabolically Healthy Overweight and Obese Youth. *Pediatrics* (2013).
2. Ball BW , Sellers EA , Wicklow BA , Dean HJ. Diabetes guidelines. *CMAJ : Canadian Medical Association* (2013) 185: 3

3. Yardley J, Mollard R, MacMillan F, MacIntosh A, Wicklow B, Hurd C, Berard L, McGavock J. The importance of vigorous intensity physical activity for metabolic control in type 1 diabetes. *Can. J Diabetes*. Accepted August 20 13
4. Senechal M., Hay J, Wicklow B, Eskicioglu P, McGavock J. Fitness is not associated with metabolically healthy obesity in adolescents. *Pediatrics*. In Press.
5. Rempel JD, Packiasamy J, Dean HJ, McGavock J, Janke A, Collister M, Wicklow B, Sellers EA. Preliminary analysis of immune activation in early onset type 2 diabetes. *Int J Circumpolar Health*. 2013 Aug 5;72.

Wittmeier, Kristy (1)

1. S  n  chal, M., Wicklow, B., **Wittmeier, K.**, Hay, J., MacIntosh, A., Eskicioglu, P., Venugopal, N., McGavock, J. *Cardiorespiratory Fitness and Adiposity in Metabolically Healthy Overweight and Obese Youth*. *Pediatrics*. 2013 July 132(1).

2013 DREAM Theme Symposium Itinerary
Interventions to Prevent and Treat Type 2 Diabetes
Location: MICH 500

Time	Speaker	Topic
9:15 – 9:25	Dr. Grant Hatch & Dr. Jon McGavock	Welcome
9:30-10:30	Dr. Bruce Verchere University of British Columbia	Understanding beta cell failure in type 2 diabetes: Studies along the path to therapeutic translation
10:30 – 10:45	Break	
10:45-11:15	Dr. Peter Jones University of Manitoba	Functional foods for the treatment of obesity and related complications
11:15-11:45	Dr. Jon McGavock University of Manitoba	Lifestyle interventions for the prevention of type 2 diabetes in youth
12:00-13:00 (MICH Research Rounds)	Dr. Phil Zeitler University of Colorado	Management of type 2 diabetes in youth: The view from TODAY
1:30-2:00	Dr. Paul Fernyhough University of Manitoba	Novel therapy for neurological complications of diabetes
2:00-2:30	Hana Vakili University of Manitoba	Physical Exercise in Pregnancies Complicated by Obesity: Benefit or Risk?
2:30-3:00	Break	
3:00-3:30	Dr. Vern Dolinsky University of Manitoba	Gestational Diabetes and the Fetal Origins of Disease: Novel Interventions
3:30-4:00	Dr. Harold Aukema University of Manitoba	Targeted lipidomic analysis of oxylipins to screen for metabolic abnormalities
4:00-5:00	Dr. Patrick Schrauwen Maastricht University	Prevention and treatment of type 2 diabetes: Translational studies on the role of mitochondria