Cardiac Physiome 2017: *Metabolism, mechanics, and ion fluxes*

Monday 6 Nov. 2017

18:30 - 20:00  
Reception: Gerrard Room at Chelsea Hotel

Tuesday 7 Nov. 2017  
7:30  
University of Toronto Faculty Club, 41 Willcox St.  
Breakfast and registration

Session I - Introduction:  
Chairs: Jim Bassingthwaite / Craig Simmons, *UW/UT*

8:30  
Jim Bassingthwaite  
University of Washington  
Introduction & Overview of the meeting

8:35  
Denis Noble (by Video)  
Oxford University  
Putting the genome in its place in physiology and evolution

Session IIA - Metabolism and Integrated Cardiac Function  
Chair: Graham Collingridge, *U of T*

8:45  
KEYNOTE: Heinrich Taegtmeyer  
Texas Health Science Center  
Cardiac metabolism

9:20  
Discussion

9:30  
Edmund Crampin  
University of Melbourne  
Modeling Cardiac Metabolism

10:00  
COFFEE / TEA

Session IIB - Metabolism and Integrated Cardiac Function  
Chair: Brenda Andrews, *U of T*

10:15  
Christine Des Rosiers  
Montreal Heart Institute  
Long chain acylcarnitines: from metabolism to heart function

10:45  
Fabio Recchia  
Temple University  
Novel circulating modulators of cardiac substrate metabolism

11:15  
Johannes HGM van Beek  
Vrije Universiteit Amsterdam  
Alpe d’Huez cycling, PCr shuttle to whole body energy balance

11:45  
Flash poster presentations  
(20 presenters, each 1 slide, 1 minute)

12:05-13:00  
LUNCH + POSTERS

Session III - Cardiac Energetics and Mechanics:  
Chair: Michael Sefton, *U of T*

13:00  
KEYNOTE: Robert Balaban  
NIH/NHLBI  
The mitochondria reticulum of muscle cells

13:35  
Dan Beard  
U. Michigan  
Myocardial energy transduction: from substrates to mechanical work

14:00  
Ranjan Dash  
Med Coll Wisc  
Molecular modeling of NADPH oxidase 2 assembly, activation and ROS production

14:20  
Denis Loiselle  
University of Auckland  
Estimating the thermodynamic efficiencies of initial and recovery metabolism

14:40  
David Nordsletten  
King’s College London  
Regional flows, mechanical work and energetics

15:00 - 15:10  
COFFEE / TEA
Session IV - Multicellular interactions in cardiac remodeling.  
Chair: Seiryo Sugiura, University of Tokyo

15:10 Mansoor Husain Cardiac protection via metabolic modulation of coronary vascular cells: University of Toronto effects of a small peptide therapeutic

15:40 Milica Radisic How to make cardiomyocyte cultures thrive Univ Toronto

16:00 Dunja Aksentijevic Causal link between intracellular Na\(^+\) elevation and King's College, London metabolic remodeling in heart failure

16:20 Eleonora Grandi New insight into subcellular heterogeneity and temporal characteristics UC Davis of the fight or flight response in cardiac myocytes

16:40 Peter Kellman Magnetic resonance imaging application NHLBI/NIH of myocardial perfusion models

Tuesday evening: Unprogrammed

Wednesday 8 Nov. 2017  
U of T Faculty Club 41 Willcox St.

7:30 - 8:30 Breakfast

Session V - Cardiac Substrate Metabolism  
Chair: John Chatham, Johns Hopkins U

8:30 KEYNOTE: Gary Lopaschuk  
Univ. Alberta Metabolic flux control

9:10 Doug Lewandowski Cardiac lipid dynamics and metabolic remodeling  
U. Illinois-Chicago

9:40 Forbes Dewey Modeling oxygen requirements in ischemic cardiomyocytes  
MIT

10:00 - 10:10 COFFEE / TEA

Session VI - Cardiac Metabolism and EC Coupling  
Chair: James Schwaber, Thomas Jefferson U

10:15 Chae Hun Leem Functional changes of mitochondria with/without substrates  
Korea

10:30 Yael Yaniv Haifa Bioenergetic feedback between heart cell contractile  
Technion, Haifa machinery and mitochondrial 3D deformations

10:45 Coert Zuurbier Diabetes, heart failure, and the effective  
AMC, Amsterdam SGLT2 inhibitors: linked by cardiac sodium.

11:00 M. Saleet Jafri Calsequestrin mutation and EC coupling dynamics  
George Mason U

11:15 Frank Sachse Cardiac fibroblasts in cardiac conduction and remodeling  
U. Utah

11:30 Jeff Saucerman Signaling fibrosis in post-infarct remodeling  
U. Virginia

11:45 Flash poster presentations (20 presenters, each 1 slide, 1 minute)

12:05 - 13:30 POSTERS and LUNCH

Session VII - Growth and Remodeling:  
Chair: Craig Simmons, U of T

13:30 Jeff Omens Structural responses in resynchronization therapy  
USCD

13:50 Philippe Pasdois Early metabolic and mitochondrial remodeling  
University Bordeaux in a pig model of atrial fibrillation
14:10  Ellen Kuhl
       Stanford University
       Predicting drug-induced arrhythmias by multiscale modeling

14:30  Michael Sacks
       University of Texas at Austin
       In vivo myocardial compressibility and its impact on contractile energetics in the healthy and the infarcted heart

14:50  Rodrigo Fernandez-Gonzalez
       U of Toronto
       Stochastic force patterns promote coordinated cell movements during scarless wound repair

15:10- 15:20  

TEA / COFFEE

Session VIII - Signaling and Remodeling  
Chair: Christopher Yip, U of T

15:20  Peter Kohl
       Sat-Nav for the inner cities of the heart: Mapping 3D cell-nanostructure

15:40  Michael Regnier
       U Washington
       Supercharging the heart: Elevating 2-deoxy-ATP to increase myocardial performance

15:55  Naomi Chesler
       U Wisconsin
       LV influence on RV contraction

16:10  Alex Quinn
       Dalhousie U, Halifax
       Metabolic, mechanical, and electrical considerations for optical mapping studies of ischemia and infarction

16:25  Polina Mamoshina
       Oxford U
       Beyond electrophysiology: Predicting drug-induced cardiotoxicity by combining transcriptome analysis and machine learning

16:40  Peter Backx
       York U & U Toronto
       Signaling in atrial remodeling and fibrillation

16:55  Jim Bassingthwaighte
       U Washington
       Meeting Summary. Next day plans: Tutorials, CiPA

17:00  Gather at the bar while the dinner is being set up.

18:00  Conference Banquet at U of T Faculty Club

Thursday 9 Nov. 2017

7:30 - 8:30  Breakfast  Bantering Institute, Room 131, 100 College Street across from MaRS Bldg.

Session IX- Reproducible multiscale modeling, data + VVUQ  Chair: Dan Beard
       Bantering Institute, Room 131, 100 College Street across from MaRS Bldg.

8:30  Edmund Crampin
       Melbourne
       Bond-Graph construction of models: more than an aid to verification.

8:55  Akinori Noma
       Ritsumeikan U.
       Understanding mechanisms underlying the physiological functions using models: e-Heart

9:20  Brian Carlson       Dan Cook
       U Michigan       U Washington
       Modular formulation, reconstruction of multiscale models

9:50-10:00  COFFEE/TEA

10:00  Jim Bassingthwaighte
       UW
       Packaging Reproducibility from experiment to Analysis via VV and UQ

10:30  Gerald Brusher
       Mathworks
       Matlab: SimBiology vs Simula, Modelica, JSim

11:00  David Nickerson
       U Auckland
       Physiome updates: journal, portal, and standards as an aid to comprehension and sharing

11:30  Group Discussion
       Beyond MIRIAM's minimal standards to reproducible standards w/ data. Beyond ODEs to include PDEs.
12:00 Lunch: MaRS Tower West (661 University Avenue) at the 14th Floor TBEP (Translational Biology and Engineering) Lounge. From Banting, cross the street. From the Chelsea walk north on Elizabeth to MaRS East and walk indoors to MaRS West. Take elevator to 14th Floor, Room 1440.

CiPA in-silico modelling workshop: co-Chairs: Gary Mirams and David Strauss

13:00 - 19:00 Walk South from MaRS elevator into Toronto General Hosp 200 Elizabeth Street Room 025/026

13:00 David Strauss (FDA) Introduction and regulatory perspective
13:40 Kylie Beattie (FDA / GSK) hERG and IKr modelling, Kinetic models of drug interaction, Data quality and experimental considerations
Adam Hill (Victor Chang) Wendy Wu (FDA)
Randall Rasmusson (University at Buffalo, New York State)
14.35 Zhilhua Li (FDA) Action potential modelling, optimising conductances for studying drug action, Stem cell derived myocyte models
Brian Carlson (University of Michigan) Trine Krogh-Madsen (Cornell)
Randall Rasmusson (University at Buffalo, New York State)

15:35-15:45 COFFEE/TEA

15.45 Jonathan Moreno (Washington University in St. Louis) Other channels (INa, ICaL, ...)
Ken Wang (Roche)
17.00 Zhilhua Li (FDA) Pro-arrhythmic risk markers, Validation plans
Jaimit Parikh (IBM)
Mark Davies (QT Informatics)
Elisa Passini (Oxford)
Sebastian Polak (Certara)
Ele Grandi (UC Davis)
18.00 - 19.00 David Strauss (FDA) Future plans, Discussion
Gary Mirams (University of Nottingham)

PROGRAM COMMITTEE SCIENTIFIC ADVISORY COMMITTEE

James Bassingthwaighte, U. Washington (Chr) Peter Hunter, University of Auckland
Dan Beard, University of Michigan Heinrich Taegtmeyer, U. Texas, Houston
Andrew McCulloch, UC San Diego Michael Regnier, University of Washington,
Craig Simmons, University of Toronto