

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 Bassingthwaighte / Craig Simmons, *UW/UT*

- 8:30 Jim Bassingthwaighte
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 Taegtmeier
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**

- 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** Banting Institute, Room 131, 100 College Street across from MaRS Bldg.

Session IX- Reproducible multiscale modeling, data + VVUQ

Chair: Dan Beard

Banting 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
U Michigan Dan Cook
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
Adam Hill (Victor Chang) interaction, Data quality
Wendy Wu (FDA) and experimental considerations
Randall Rasmusson (University at Buffalo, New York State)

14.35 Zhihua Li (FDA) Action potential modelling, optimising
Brian Carlson (University of Michigan) conductances for studying drug action,
Trine Krogh-Madsen (Cornell) Stem cell derived myocyte models

15:35-15:45 **COFFEE/TEA**

15.45 Jonathan Moreno (Washington University in St. Louis) Other channels (INa, ICaL, . . .)
Ken Wang (Roche)

17.00 Zhihua 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 Bassingthwaite, U. Washington (Chr)

Peter Hunter, University of Auckland

Dan Beard, University, of Michigan

Heinrich Taegtmeier, U. Texas, Houston

Andrew McCulloch, UC San Diego

Michael Regnier, University of Washington,

Craig Simmons, University of Toronto