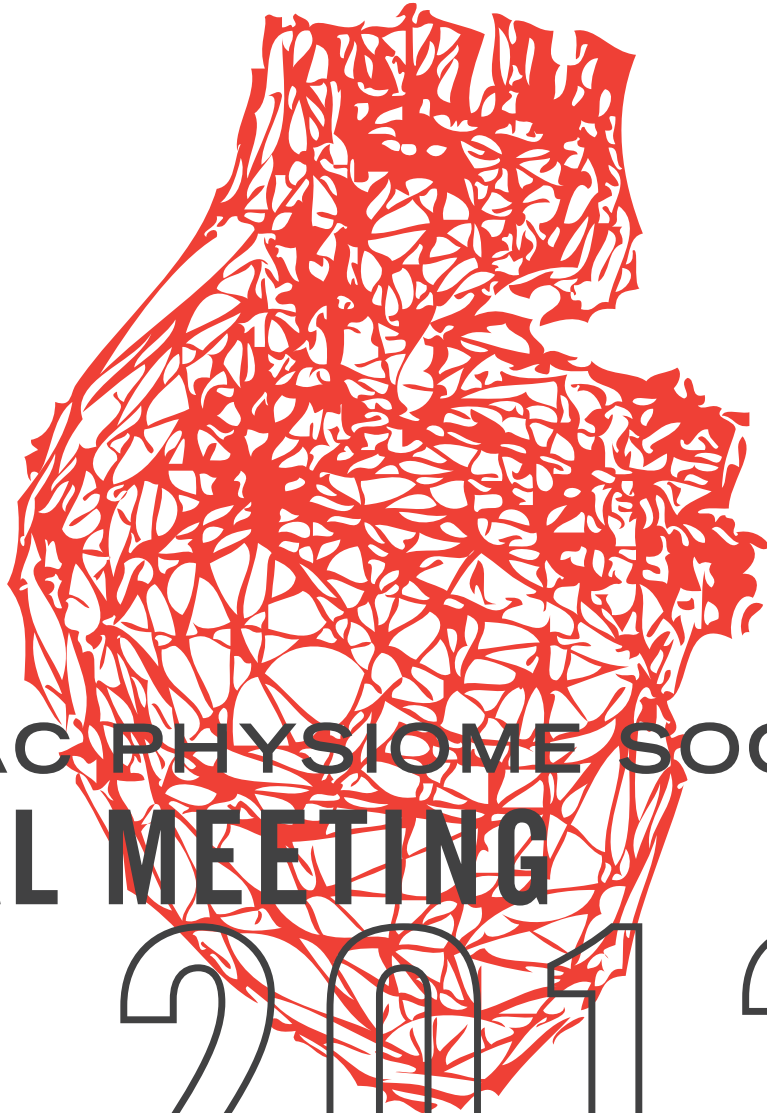


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CARDIAC PHYSIOME SOCIETY ANNUAL MEETING

2013

BAR HARBOR, ME

October 17 – 19, 2013



The Virtual Physiological
Rat Project www.virtualrat.org



With support from the National Institute of General Medical Sciences of the National Institutes of Health.

THURSDAY, OCTOBER 17

7:30 AM	Registration	Elevator Lobby
7:30 AM	Continental Breakfast	Ballroom
8:30 AM	Opening Remarks: Daniel Beard, University of Michigan, Ann Arbor	Ballroom
9:00 AM	Plenary Lecture	Ballroom

Human Heart Physiology in Health and Disease **Igor Efimov, Washington University, St. Louis**

10:00 AM	Coffee Break	Stone House
10:30 AM	SESSION 1.1: Patient-Specific Therapies and Other Translational Applications.	Ballroom
	<i>Chair: Robert Balaban, NHLBI, Bethesda</i>	

Drug Discovery Using Engineered Heart Tissues: “Personalizing” Drugs **Tetsuro Wakatsuki, InvivoSciences, Madison**

Data-Driven Computational Models of Heart Physiome **Tommaso Mansi, Siemens Corporation, Princeton**

A Patient-Specific Model of Coronary Fractional Flow Reserve **Eun Bo Shim, Kangwon National University, Chuncheon** Based on a Multi-Scale Approach

Characterization of Coronary Intramural Branch Segments **Maria Siebes, Academic Medical Center, Amsterdam** in Relation to Myocardial Depth

12:00 PM	Poster Talks	Ballroom
12:30 PM	Lunch	Dining Room
1:30 PM	Posters and Dessert	Stone House
2:30 PM	SESSION 1.2: Cellular Mechanics and Excitation-Contraction Coupling	Ballroom
	<i>Chair: Brian Carlson, University of Michigan, Ann Arbor</i>	

Mechanical Signaling to the Calcium Control System **Leighton Izu, University of California, Davis**

The Role of Metabolic Dysfunction in Heart Failure **Scott Bugenhagen, Medical College of Wisconsin, Milwaukee**

Late Na Current, Cellular Na Loading and Arrhythmogenesis **Eleonora Grandi, University of California, Davis**

3:45 PM	Coffee Break	Ballroom
4:00 PM	SESSION 1.3: Whole-Organ Electrical and Mechanical Function	Ballroom
	<i>Chair: James Bassingthwaighe, University of Washington, Seattle</i>	

Biophysical Properties of the Cardiac Myofilaments Define Their **Stuart Campbell, Yale University, New Haven** Multi-Functional Role in Whole-Heart Physiology

When Models Fail: Lessons Learnt from Modelling the Mouse Heart **Steven Niederer, The Rayne Institute, London**

Modeling Cardiac Fluid-Structure Interaction **Boyce Griffith, New York University, New York**

5:15 PM	Special Topic	Ballroom
	NIH Funding, Big Data, Multi-Scale Modeling and the Cardiac Physiome	Jennie Larkin, NHLBI, Bethesda
5:45 PM	Dinner on your own	

FRIDAY, OCTOBER 18

8:15 AM Continental Breakfast Stone House

9:00 AM Plenary Lecture Ballroom

Control of Coronary Blood Flow **Johnathan Tune, Indiana University, Indianapolis**

10:00 AM Coffee Break Ballroom

10:15 AM **SESSION 2.1: Cardiogenesis and Cardiac Remodeling** Ballroom

Chair: Michael Regnier, University of Washington, Seattle

Inferring the Mammalian Cardiogenic Gene Regulatory Network **Jason Bazil, University of Michigan, Ann Arbor**

Mechanical Remodeling in Diastolic Heart Failure: Altered Cross-Bridge **Sukriti Dewan, University of California, San Diego**

Relaxation Kinetics in Guinea Pig Cardiac Hypertrophy

Electrophysiological Heterogeneity of the Earliest Contracting Cardiomyocytes **Timothy Kamp, University of Wisconsin, Madison**

Differentiated from Human Pluripotent Stem Cells: Objective Characterization

Progression of Right Ventricular Cellular and Whole Organ **Naomi Chesler, University of Wisconsin, Madison**

Dysfunction in Pulmonary Arterial Hypertension

11:45 PM Poster Talks Ballroom

12:15 PM Lunch Dining Room

1:15 PM Posters and Dessert Stone House

2:15 PM **SESSION 2.2: Coronary Blood Flow, Substrate Delivery, and Metabolism** Ballroom

Chair: Jos Spaan, Academic Medical Center, Amsterdam

The Difficult Task of Assessing Regional Cardiac Energy **Fabio Recchia, Temple University, Philadelphia**

Substrate Metabolism, In Vivo

Regulation of Oxidative Phosphorylation by Phosphate and Adenine Nucleotides **Kalyan Vinnakota, University of Michigan, Ann Arbor**

Systems Biology of the Cardiac Mitochondrion **Robert Balaban, NHLBI, Bethesda**

Coronary Microvascular Function in Health and Coronary Artery Disease **Dirk Duncker, Erasmus University, Rotterdam**

3:45 PM Coffee Break Ballroom

4:00 PM **SESSION 2.3: Cellular Electrophysiology and Calcium Handling** Ballroom

Chair: Jose Puglisi, University of California, Davis

Cardiac Calcium Signaling: Stability Versus Instability **W. Jonathan Lederer, University of Maryland, Baltimore**

Simulation Analyses of the Role of Mitochondria-Sarcoplasmic Reticulum **Satoshi Matsuoka, University of Fukui**

Ca²⁺ Communication on the Rhythmicity of Sinoatrial Node Cells

Modeling the Bidirectional Coupling of Localized Calcium **Gregory Smith, The College of William and Mary, Williamsburg**

Elevations and Whole Cell Calcium Responses

Marching to the Beat of the Calcium Drum: Arrhythmia Mechanisms in **Hector Valdivia, University of Michigan, Ann Arbor**

Gain- and Loss-of-Function Ryanodine Receptor Mutations

5:30 PM Break on your own

6:30 PM Cocktails Stone House

7:30 PM Conference Dinner Stone House

SATURDAY, OCTOBER 19

8:15 AM Continental Breakfast Stone House

9:00 AM Plenary Lecture Ballroom

The Physiome Project and the Virtual Physiological Human Peter Hunter, *The University of Auckland*

10:00 AM Coffee Break Ballroom

10:15 AM **SESSION 3.1: Integration of the Cardiac Physiome with Whole-Body Function Ballroom**

Chair: Stig Omholt, Norwegian University of Science and Technology, Trondheim

Scalable Strategies for the Modular Composition of Physiological Models Maxwell Neal, *University of Washington, Seattle*

Arterial Stiffening Provides Sufficient Explanation Klas Pettersen, *Norwegian University of Life Sciences, Aas*
for Primary Hypertension

Mechanisms of Local Regulation of Blood Flow to Tissue Brian Carlson, *University of Michigan, Ann Arbor*

Whole-Body Models, Model Exploration, Model Thomas Heldt, *Massachusetts Institute of Technology, Cambridge*
Identification, and Model Reduction

11:45 PM Coffee Break Ballroom

12:00 PM Business Meeting Ballroom

1:00 PM Boxed Lunch and Meeting Conclusion Dining Room

PROGRAM COMMITTEE:

Daniel Beard, University of Michigan, Ann Arbor
Brian Carlson, University of Michigan, Ann Arbor

SCIENTIFIC ADVISORY COMMITTEE:

Daniel Beard, University of Michigan, Ann Arbor
Peter Hunter, University of Auckland
Satoshi Matsuoka, University of Fukui
Andrew McCulloch, University of California, San Diego
Nicolas Smith, King's College London

ORGANIZING COMMITTEE:

Daniel Beard, University of Michigan, Ann Arbor
Brian Carlson, University of Michigan, Ann Arbor
Gary Churchill, The Jackson Laboratory, Bar Harbor
Laura Ingerson, The Jackson Laboratory, Bar Harbor
Melinda Dwinell, Medical College of Wisconsin, Milwaukee
Stacy Romant, Medical College of Wisconsin, Milwaukee

It is our pleasure to welcome you to the 2013 Cardiac Physiome Workshop in Bar Harbor. We are excited by the high quality of presentations, continued from previous years, and the participation of so many graduate students and postdoctoral fellows. We look forward to vibrant scientific interactions and fruitful discussions that will continue to promote new collaborations and advance our growing field.

We would like to thank all of our sponsors for making this meeting possible through their generous financial support.