Thursday, December 5, 2019

Session 1: Basic Requirements for Translation / UQSA

09:00-10:00 Keynote Lectures: How to Deal with Uncertainties in Clinical Translation of Models
Steven Niederer, King’s College London & Gary Mirams, University of Nottingham

10:00-11:00 Poster Teaser Presentations:
1. Maurice Hendrix - Flexible code generation from CellML
2. Andrew Foulkes - Subcritical Hopf Bifurcations within FitzHugh-Nagumo
3. Michael Moulton - Low-order cardiac mechanics model: Application to benchmark problems
4. Liam Murphy - Aortic pressure estimation from peripheral artery measurements for use in cardiovascular models.
5. Dominic Whittaker - Rapid characterisation of R56Q mutant hERG channel kinetics using sinusoidal voltage protocols
6. Michael Regnier - The significance of two atoms: optimization of the actomyosin chemo-mechanical cycle by 2’-deoxy-ATP
7. Sarah Kosta - In silico analysis of the Frank-Starling mechanism and its relationship with vascular filling therapy
8. Tim van Loon - In silico mechanistic analysis of exercise intolerance in heart failure with preserved ejection fraction
9. Emanuele Rondanina - A 0-dimensional multi-scale model for left ventricular growth and hemodynamic feedback
10. Michael Sacks - Image-Based Simulation of Mitral Valve Repair Surgery for Predicting Patient-Specific Outcomes
11. Michael Sacks - Patient Specific Modeling of Left Ventricle with Mitral Valve: Insights into the role of Ischemic Regurgitation Induced by Myocardial Infarction
12. Rachel Smith - Incorporating pulse wave velocity into model-based pulse contour analysis method for estimation of cardiac stroke volume
13. Beatriz Trenor - Multiscale modeling of human heart failure to optimize treatments
14. Erik Willemen - Afterload dependence of left and right ventricular response to pacing delay optimization: a combined experimental-computational study
15. Aurore Lyon - Determinants of beat-to-beat left ventricular function during atrial fibrillation: a combined clinical-computational study
16. Mehrdad Shahmohammadi – A hemodynamics-driven mathematical model of the generation of heart sounds

11:00-11:30 Break and Poster Viewing
11:30-11:50 Variability in patch-clamp data: biological variability or experimental artefacts?
Chon Lok Lei, University of Oxford
11:50-12:10 Predicting changes to $I_{Na}$ from SCN5A mutations: Can we prevent our knowledge of the sodium current getting lost in translation?  
**Michael Clerx, University of Oxford**

12:10-12:30 Parameter Subset reduction for patient-specific modelling of Arrhythmogenic Cardiomyopathy related mutation carriers in the CircAdapt model  
**Nick van Osta, Maastricht University**

12:35-12:45 Concluding Remarks

12:45-14:00 Lunch and Poster Viewing

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**Session 2: Congenital Heart Disease**

14:00-15:00 Dutch Heart Foundation Lecture: It Takes Two To Tango: The Tale of a Pediatric Cardiac Surgeon and a Bioengineer  
**Andrew McCulloch, UC San Diego & Tain-Yen Hsia, Yale University**

15:00-15:20 T.B.A.  
**Leonid Goubergrits, Charite Berlin**

15:20-15:40 Simulating the cardiovascular fetal-to-neonatal transition in healthy and pathological conditions  
**Anneloes Munneke, Maastricht University**

15:40-15:45 Concluding Remarks

15:45-16:15 Break and Poster Viewing

16:15-17:00 Poster Teaser Presentations:

1. Jean Bragard - Are high-resolution voltage maps a predictor tool in the treatment of atrial fibrillation?
2. Jordan Elliott - An in silico study to determine the stability of the atrial model through the introduction of cell-to-cell variability.
3. Mohamadamin Forouzandehmehr - Comparison between two mathematical contractile element models for hiPSC-CMs
4. Lian Laudy - Computational modelling of calcium-dependent signalling pathways and their long-term effects on cardiac calcium handling and arrhythmogenesis
5. Kimberly McCabe - A Multiscale Computational Model to Determine the effects of 2-deoxy-ATP on SERCA Pump Function
6. Jun-ichi Okada - Investigation of the generation mechanism of line block in the non-contact mapping system using patient-specific heart simulator
7. Arkady Pertsov - Realistic Simulation of Arrhythmia Onset and Drug Therapy
8. Stefano Severi - A novel computational model of human ventricular action potential
9. Cristian Trovato - Development and coupling of two novel human in silico ventricular and Purkinje models for investigation of pro-arrhythmia mechanisms across the Purkinje-Myocardial junction
10. Nele Vandersickel - Evaluation of DG-mapping in (complex) Atrial Tachycardia
11. Nienke Juliëtte Verzaal - Time course of repolarization changes after start of cardiac resynchronization therapy
12. Jae Boum Youm - A computational study on the interatrial difference of rate in the arrhythmogenicity on sympathetic stimulation

17:00-18:00 Poster Session and Social Hour Drinks
### Session 3: Heart Failure

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| 09:00-10:00 | Keynote Lectures: Sarcomere Contraction and Heart Failure: On The Development of Thoughts and Models  
Jolanda van der Velden, VUMC Amsterdam & Theo Arts, Maastricht University |
| 10:00-10:20 | Experimentally increasing titin compliance in a novel mouse model attenuates the Frank-Starling mechanism but has a beneficial effect on diastole.  
Henk Granzier, University of Arizona |
| 10:20-10:40 | A Multiscale Model of Cardiac Remodeling under Pulmonary Arterial Hypertension: From Organ to Titin  
Michael Sacks, University of Texas at Austin |
| 10:40-11:10 | Break and Poster Viewing |
| 11:10-11:30 | Multiscale modeling of cardiovascular function predicts that the End-Systolic Pressure Volume Relationship can be targeted via multiple therapeutic strategies  
Kenneth Campbell, University of Kentucky |
| 11:30-11:50 | Effect of Infarct Stiffness on Left and Right Ventricular Remodeling: a Computational Study Based on Myocardial Mechano-Sensing  
Tijmen Koopsen, Maastricht University |
| 11:50-12:10 | T.B.A.  
Yael Yaniv, Technion |
| 12:10-12:15 | Concluding Remarks |

### Session 4: Electrophysiology & Complex Arrhythmias

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| 13:30-14:30 | Keynote Lectures: Novel Anti-Arrhythmic Therapy Development: Joint Venture of a Cardiologist and a Modeler  
Felix Wiedmann, University of Heidelberg & Gunnar Seemann, University of Freiburg |
| 14:30-14:50 | Modelling crosstalk between RyR and IP3R calcium release in cardiomyocyte growth signaling  
Edmund Crampin, University of Melbourne |
| 14:50-15:10 | Mechano-Electric Coupling and Arrhythmogenic Current Generation in a Computational Model of Coupled Myocytes  
Viviane Timmermann, Simula Norway |
| 15:10-15:30 | Investigation of the generation mechanism of line block in the non-contact mapping system using patient-specific heart simulator  
Jun-ichi Okada, University of Tokyo |
| 15:30-16:00 | Break and Poster Viewing |
| 16:00-16:20 | Three-dimensional heart model–based screening of proarrhythmic potential by in silico simulation of action potential and electrocardiograms: verapamil and ranolazine vs. dofetilide  
Chae Hun Leem, University of Ulsan |
| 16:20-16:40 | A Clinical Ventricular Arrhythmia Simulation Framework May Require Personalization Beyond Scar Substrate  
Matthijs Cluitmans, Maastricht University |
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<td>16:40-17:00</td>
<td>T.B.A. Hector Martinez-Navarro, University of Oxford</td>
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| 17:00-17:20 | Improving the clinical translation of simulation results by using patient-specific models to investigate arrhythmia mechanisms in infarct patients undergoing cardiac resynchronization therapy  
*Caroline Mendonca Costa, King’s College London* |
| 17:20-17:40 | Human in silico study of electrical phenotypes in Arrhythmogenic Cardiomyopathy explains variable disease manifestation on QRS morphologies  
*Peter Marinov, University of Oxford* |
| 17:40-17:45 | Concluding Remarks |
| 17:45-18:00 | Info on Next Conference |
| 18:00      | Closing Remarks |