MURPA Seminar 4/2009: **Multi-scale modeling of the cardiovascular system**

Date and Time: Thursday 2 April 2009, 10-11am

Place: Seminar Room 135, Building 26, Monash Clayton

Presenter: Dr Roy Kerckhoffs, UCSD Department of Bio Engineering

Abstract

We are developing functionally integrated cell systems models of cardiac metabolism, signal transduction, excitation-contraction coupling, and myofilament interactions. These are then being incorporated into structurally integrated multi-scale models of cardiac electromechanical interactions that include tissue, organ and system scale properties. We describe new results with these models in which the effects of transmural heterogeneities in myocyte ionic currents and calcium handling on arrhythmia mechanisms and electromechanics are investigated.

Bio

March 1st, 2003 to September 30th, 2003: Postdoctoral researcher at Eindhoven University of Technology in the Netherlands under supervision of Prof Arts. Subject: modeling adaptation of mechanics of the normal heart and during situs inversus.

November 1st, 2003 to November 30th, 2007: Postdoctoral researcher at the University of California at San Diego under supervision of Prof McCulloch. Subject: Multi-scale Modeling of Biophysics of Cardiac electromechanics and Ventricular-Vascular Coupling.

December 1st, 2007 to November 30th, 2011: Assistant Project Scientist at the University of California at San Diego. Research in cardiac electromechanics through computational and experimental means with a focus on heart failure and cardiac resynchronization therapy. - Leading chair and organizer of session on multiscale modeling at PSB2009, 5-9 January 2009, Hawaii - Review Panelist for National Science Foundation, 2009. Invited by NSF. - Member of Technical Program Committee of World Congress on Medical Physics and Biomedical Engineering, September 2009. Invited by WCE.

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