

ADVANCES IN COMPUTATIONAL CARDIOVASCULAR MODELING AND SIMULATION

DANIEL E. HURTADO^{*}, ELLEN KUHL[†]
AND MICHAEL ORTIZ[§]

^{*} Department of Structural and Geotechnical Engineering, Pontificia Universidad Católica de Chile,
Vicuña Mackenna 4860, Macul, Santiago, Chile
dhurtado@ing.puc.cl

[†] Departments of Mechanical Engineering, Bioengineering and Cardiothoracic Surgery
496 Lomita Mall, Durand 217, Stanford, CA 94305, USA
ekuhl@stanford.edu

[§] Division of Engineering and Applied Sciences, California Institute of Technology
1200 E. California Blvd., Pasadena, CA 91125, USA
ortiz@aero.caltech.edu

Key words: Computational biomechanics, cardiac electro-mechanics, cardiac and vascular tissue biomechanics, computational electrophysiology, growth and remodeling.

ABSTRACT

Despite major breakthroughs in cell therapy and minimally-invasive surgery during the last decades, cardiovascular disease (CVD) remains the leading cause of death in industrialized and many developing countries. Today, computational modeling and simulation of the cardiovascular system arises as a powerful tool in both the study of cardiovascular pathology and the design of novel surgical therapy and medical devices.

This mini-symposium aims at bringing together experts in the broad field of computational cardiovascular modeling and simulation. Contributions are invited on topics including, but not limited to, theoretical and applied advances in cardiac electro-mechanics, tissue biomechanics, patient-specific cardiovascular modeling, growth and remodeling, heart valve mechanics, soft-tissue multiscale modeling and high-performance computing applied to cardiovascular mechanics. Applications of computational tools to the study of cardiac arrhythmogenesis and resynchronization therapy, surgical ventricular remodeling, balloon angioplasty and endovascular stenting, as well as verification and validation of computational methods aiming at clinical translation are particularly encouraged.