



Computational and Mathematical Methods in Medicine

Special Issue on **Numerical Methods and Applications in Biomechanical Modeling 2014**

CALL FOR PAPERS

Numerical methods in biomedical research are a rapidly developing field to provide a state-of-the-art tool for biomedical research and applications. Reliable predictions will lead to patient-specific simulations in the next decade to improve the diagnoses and treatment of diseases. The main focus of this special issue will be on the interface between numerical methods and biomedical applications especially for cardiovascular dynamics and heat transfer problem in the human body. It is also interesting to have quantitative analysis from the molecular up to the organ level. The goal of this special issue is to bring together experts in related fields of computational biomedical engineering like multiscale flow modeling (3D, 1D, and 0D models), blood flow propagation, boundary conditions, fluid-solid coupling, inverse problems in biomechanics, high-performance computing of multiphysics discretization schemes, cardiovascular biomechanics, and porous media. In addition, advanced applications in the field of biomechanics and hemodynamics problems as aneurysm modeling, valvular modeling, transport phenomena, tear and dissection of soft tissue, coronary artery diseases, and the modeling of medical devices are welcome. This special issue aims to foster engagement across areas of numerical methods to identify novel applications to challenging biomechanical modeling problems.

Potential topics include, but are not limited to:

- ▶ Fluid mechanics (multiscale flow modeling, blood flow propagation, 0D and 1D models, boundary conditions, etc.)
- ▶ Inverse problems in biomechanics
- ▶ High-performance computing of multiphysics discretization schemes
- ▶ Cardiovascular biomechanics
- ▶ Coronary artery modelling
- ▶ Reduced-order model in vascular dynamics
- ▶ Heat and transport phenomena
- ▶ Software development for biomechanics and biomedical engineering
- ▶ Experimental models of cardiovascular diseases

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