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ABSTRACT

Mechanical forces are an integral part of biology and medicine, with cells and tissues constantly adapting to the mechanical stresses to which they are subjected. Therefore, to understand physiological and pathophysiological conditions – and eventually predict outcomes and stratify patients according to risk – quantification of tissue and cellular stresses is often required. Advances in computational mechanics have made quantification of stresses feasible in a wide variety of applications: from blood flow velocities and wall shear stresses in cardiovascular tissues, to stresses in soft tissue and bone, as well as the interaction between fluids, tissues and the environment. This mini symposium will focus on new developments in computational mechanics that enable quantification of biological and medical problems, as well as applications of computational mechanics (including computational fluid dynamics and fluid-structure or multiphysics problems) to biological and medical problems. Topics of interest include, but are not limited to:

- New computational methods and algorithms for biomedical applications
- Computational models of molecular, cellular and tissue mechanics
- Cardiovascular mechanics and thrombosis models
- Models of developmental processes, tissue remodelling and growth
- Multiscale and multiphysics biomedical models
- Surgical simulation and planning
- Biomedical device development and optimization