

MODELING OF BIOFLUIDS FROM VASCULAR FLOWS TO CELL DYNAMICS

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ABSTRACT

The minisymposium is focused on the modeling of hemodynamics and the challenges to be met to improve the prevention, diagnostic and treatment of cardiovascular diseases. Blood flow mechanics is complex, being by essence multiphysics and multiscale:

- Spatial scales range from a few micrometers (e.g. cells in interaction within capillaries) to macroscopic length scales (e.g. blood flows in an organ).
- Temporal scales range from seconds (e.g. adhesion to vascular walls and red cells aggregation) to years (e.g. growth of aneurysms).
- The physical phenomena include strong coupling between fluid mechanics and deformable tissues, involving structural failures, transfer and transport mechanisms, contact and adhesion, remodeling and growth.

The goal of the minisymposium is to provide an overview of today's challenges of the modeling of blood flow-related issues, whether they aim at:

- Providing a better understanding of the hemodynamics in physiological or pathological conditions from the microcirculation to the systemic circulation,
- Identifying the causes and consequences of pathologies,
- Improving diagnostic and therapeutic techniques to foster early diagnostic and contribute to minimally invasive therapeutic technologies,
- Imagine new therapeutic approaches to enhance treatment efficacy and patients' quality of life.