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COMPUTATIONAL MODELING IN MECHANOBIOLOGY AND TISSUE ENGINEERING

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ABSTRACT

Biomechanics represents the broad interplay between biological systems and mechanics. It foster integration of scientific knowledge between related basic and applied subdisciplines.

The rational principles of solid mechanics have an unveiled potential in understanding, diagnosing and treating pathologies that manifest by tissue consistency changes. A multidisciplinary effort may allow a better understanding of the questions implied in physiology, pathology and physics from the sub-cellular level to the organ-level, in a unified way. Biological tissues are not static structures, but evolutionary (due to development, maintenance, adaptation and healing) as a response to external stimuli. Mechanobiology is aimed at determining how they evolve in respond to mechanical factors.

In this spirit, our session aims to foster the exchange of new ideas by gathering the state-of-the-art developments of biomechanics and computational mechanics problems such as:

- Scaffold Design and Characterization
- Tissue regeneration and remodelling
- Computer-aided tissue engineering
- Cell mechanobiology
- Interaction cell-tissue-biomaterial
- Cell attachment, proliferation, migration and differentiation.
- Cardiovascular biomechanics - arterial/valvular/stents/hemodynamics/respiratory
- Cellular/subcellular biomechanics
- Probabilistic mechanics of evolutionary properties
- Hard Tissue - Bone/Dental
- Imaging
- Implants/orthotics/prosthetics
- Joint biomechanics- ankle/knee/hip/hand/shoulder/other
- Soft Tissue- skin/ligaments-tendons/cartilage/other
- Tissue Engineering
- Materiomics
- Multiscale biomechanics