

TISSUE MODELING TO GET INSIGHTS IN PHARMACOLOGY, AND VICE-VERSA

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ABSTRACT

Tissue mechanical modeling has been dedicated much energy in organs such as heart, lung, liver. Models range from whole body down, whole organ, and functional multicellular units to cellular scales. Computational simulations have necessitated the development of multiphysics solvers to handle such complexity. These computational models are now at a temporal and spatial refinement that enables the simulations of pharmacokinetics and pharmacodynamics, hence shedding new light into pharmacology.

Conversely, pharmacological dynamic measurements with the advancement of imaging markers, and other research frontier tools, contain information about the underlying cells and tissues the compound is interacting with. Hence analyzing these pharmacological measurements through a mathematical model of this interaction can give access to the cellular or tissue properties. This implies to perform an inverse problem that present a number of challenges (often ill-posed, computationally intensive, ...). Innovative approaches have thus been developed to handle this complexity.

This minisymposium is thus welcoming contributions largely related to this subject, included but not restricted to, tissue biomechanical modeling, pharmacology modeling, computational aspects, inverse problems, signal acquisition and processing, application to in-vitro or in-vivo cases.