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COMPUTATIONAL MODELING OF MULTIPHYSICS/MULTISCALE COUPLED PROCESSES IN BIOLOGICAL AND NANOTECHNOLOGICAL SYSTEMS

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ABSTRACT

Further progress in studying bio- and nanotechnological systems relies on the development of novel and reliable mathematical models and efficient and accurate computational tools. The main objectives of this minisymposium are centered on bringing together applied mathematicians, computational scientists, physicists, biologists and engineers to discuss multiphysics/multiscale mathematical models and numerical methodologies for their solution, focusing on coupled processes in bio- and nanotechnological systems.

This minisymposium is aimed at exploring the links between Life Sciences and Nanotechnology. The key to success in this ambitious endeavor lies with the observation that "material" devices and "in vivo" biological systems often share common structures, functioning and driving mechanisms. In this perspective, the use of appropriate mathematical and computational models to better understand such mechanisms, and even predict possible collateral (undesired) effects, becomes increasingly important. It contributes further to the development of novel bio- and nanotechnologies, as well as to our better understanding of physiology and pathologies of biological systems. In most cases, the associated mathematical models are described by coupled systems either of differential/difference and/or integral equations which require efficient computational techniques for their solution.

This minisymposium will address challenges related to the solution of such problems and will provide a forum to the researchers working in this field, encouraging interdisciplinary collaborations. We expect minimum two sessions and the current list of tentative speakers includes 14 researchers actively working in the areas of this minisymposium.