

Simulating Organogenesis in COMSOL: Towards Efficient 3D Simulations of Organogenesis

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Abstract

One of the major challenges in biology concerns the integration of data across length and time scales into a consistent framework: how do macroscopic properties and functionalities arise from the molecular regulatory networks and how do they evolve? A deeper understanding of morphogenesis and organogenesis in particular is required to advance tissue engineering.

Recent advancements in 3D imaging technologies provide us with detailed information regarding the shape and growth rates of tissues and organs. However, the efficient solution of biochemical network models on 3D growing domains is still challenging. We will present the current possibilities and limitations in using COMSOL for such simulations.