

Soft Biological Tissue: Microstructure-Based Modeling and Simulation

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ABSTRACT

Constitutive models for soft biological tissue have developed significantly in recent years. The reasons for this are improved mechanical test setups and measurement techniques.

Microscopic investigations also provide important information. The contribution of collagen fibers has been known for many years and is taken into account in improved models. However, there are many other tissue constituents that are less known and considered, such as elastin, GAGs/PGs, muscle cells, other extracellular matrix materials.

In addition, some organs are built up of a combination of several different tissue types, e.g., muscle fibers, fat, glands etc. Improved organ models should take the different contributions into account. The mini-symposium addresses this issue, with an emphasis on how material models and simulations can be improved by informing the mathematical models with more microstructural information. Instead of deriving material models that are representative of average properties, images of various tissue constituents combined with weighted contributions to the tissue form a basis for deriving models.