Multiscale Mechanobiology in Tissue Engineering

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Abstrak

This book focuses on the mechanobiological principles in tissue engineering with a particular emphasis on the multiscale aspects of the translation of mechanical forces from bioreactors down to the cellular level. The book contributes to a better understanding of the design and use of bioreactors for tissue engineering and the use of mechanical loading to optimize in vitro cell culture conditions. It covers experimental and computational approaches and the combination of both to show the benefits that computational modelling can bring to experimentalists when studying in vitro cell culture within a scaffold. With topics from multidisciplinary fields of the life sciences, medicine, and engineering, this work provides a novel approach to the use of engineering tools for the optimization of biological processes and its application to regenerative medicine. The volume is a valuable resource for researchers and graduate students studying mechanobiology and tissue engineering. For undergraduate students it also provides deep insight into tissue engineering and its use in the design of bioreactors. The book is supplemented with extensive references for all chapters to help the reader to progress through the study of each topic.