

Cell and tissue engineering

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Abstrak

Cell and tissue engineering” introduces the principles and new approaches in cell and tissue engineering. It includes both the fundamentals and the current trends in cell and tissue engineering, in a way useful both to a novice and an expert in the field.

The book is composed of 13 chapters all of which are written by the leading experts. It is organized to gradually assemble an insight in cell and tissue function starting from a molecular nano-level, extending to a cellular micro-level and finishing at the tissue macro-level. In specific, biological, physiological, biophysical, biochemical, medical, and engineering aspects are covered from the standpoint of the development of functional substitutes of biological tissues for potential clinical use. Topics in the area of cell engineering include cell membrane biophysics, structure and function of the cytoskeleton, cell-extracellular matrix interactions, and mechanotransduction. In the area of tissue engineering the focus is on the in vitro cultivation of functional tissue equivalents based on the integrated use of isolated cells, biomaterials, and bioreactors. The book also reviews novel techniques for cell and tissue imaging and characterization, some of which are described in detail such as atomic force microscopy