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2.3.2.2 Proliferation and the ECM; 2.3.2.3 Differentiation and the ECM; 2.3.2.4 Apoptosis and the ECM; 2.3.3 Signal Transduction; 2.3.3.1 Modulation of the Cell-Matrix Interaction; 2.3.3.2 The ECM and Cell Binding; 2.3.3.3 Signals to the Inner Cell; 2.3.3.4 The ECM and Long-term Contact; 2.3.4 Matricellular Proteins; 2.3.4.1 Thrombospondin; 2.3.4.2 Tenascin C; 2.3.4.3 Osteopontin; 2.3.4.4 SPARC; 2.4 Emergence of Tissue; 2.4.1 Germ Layers and Ground Tissue; 2.4.1.1 Derivatives of the Ectoderm; 2.4.1.2 Derivatives of the Mesoderm; 2.4.1.3 Derivatives of the Entoderm; 2.4.2 Individual Cells, Social Interactions and Functional Tissue Development; 2.4.2.1 Differentiation from Individual Cells; 2.4.2.2 Functional Exceptions; 2.4.2.3 Individual Cells and Social Interactions; 2.4.2.4 Formation of tissue; 2.4.2.5 Individual Cell Cycles; 2.4.2.6 Coordinated Growth; 2.4.2.7 Competence; 2.4.2.8 Morphogenic Factors; 2.4.2.9 Apoptosis; 2.4.2.10 Necrosis versus Apoptosis; 2.4.2.11 Terminal Differentiation; 2.4.2.12 Adaptation; 2.4.2.13 Transdifferentiation; 2.4.2.14 Multifactorial Differentiation; 2.5 Regeneration; 2.5.1 Events Immediately after an Injury; 2.5.2 Wound Closure; 2.5.3 Programmed Cell Death (Apoptosis); 2.5.4 Cooperative Renewal; 3 Classical Culture Methods; 3.1 History; 3.2 First Cultures; 3.2.1 Culture Containers; 3.2.1.1 Individual Culture Containers; 3.2.1.2 Dimensions of the Container; 3.2.1.3 Coating the Culture Dish; 3.2.1.4 Filter Inserts; 3.2.2 Culture Media; 3.2.2.1 Ingredients; 3.2.2.2 Adjustment of Serum Supplements; 3.2.2.3 Serum Collection; 3.2.2.4 Serum-free Culture Media; 3.2.2.5 pH of the Medium; 3.2.2.6 Antibiotics; 3.2.2.7 Other Additives; 3.2.3 Growth Factors; 3.2.3.1 Overview of Different Growth Factors; 3.2.3.2 Effect of Growth Factors

Sommario/riassunto

Comprehensive in its scope and illustrated in detail, this practical book provides a fundamental insight into the complex world of tissue development and artificial cell culture using tissue engineering. The introductory chapters cover basic cell biology and cellular development as well as cell culture, with a main emphasis on ways of differentiating tissue and the critical evaluation of the properties of maturing tissue constructs. The authors also focus on the use of stem cells from the most varied sources in tissue engineering. The whole is rounded off by an exceptionally wide-rangin