1. Record Nr. UNINA9910812710303321 Stem cell biology and tissue engineering in dental sciences // edited **Titolo** by Ajaykumar Vishwakarma [and three others]; contributors, Samad Ahadian [and one hundred and ninety-seven others] London, [England]:,: Academic Press,, 2015 Pubbl/distr/stampa ©2015 **ISBN** 0-12-397778-9 Descrizione fisica 1 online resource (933 p.) Disciplina 612.028 Soggetti Tissue engineering Stem cells Dentistry Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Includes bibliographical references at the end of each chapters and Nota di bibliografia index. Nota di contenuto Front Cover; Stem Cell Biology and Tissue Engineering in Dental Sciences; Copyright; Contents; List of Contributors; Foreword; Chapter 1: An Introduction to Stem Cell Biology and Tissue Engineering; 1.1. Introduction; 1.2. The emergence of Tissue Engineering and regenerative medicine; 1.3. Research themes underlying Tissue Engineering technology; 1.3.1. Cells; 1.3.2. Biomaterial Scaffolds; 1.3.3. Tissue-Inducing Factors; 1.3.4. Devices and Systems; 1.4. Stem cellbased therapy; 1.4.1. Pure Stem Cell Therapy; 1.4.2. Scaffold-Based Stem Cell Therapy; 1.5. Translational Tissue Engineering 1.6. ConclusionReferences; Part I: Developmental Biology: A Blueprint for Tissue Engineering; Chapter 2: Developmentally Inspired Regenerative Organ Engineering: Tooth as a Model; 2.1. Introduction; 2.2. Understanding generation for regeneration strategies: a tooth

2.4. ECM and mechanical forces as regulators of organogenesis; 2.5. Engineering approaches for tooth organ regeneration; 2.6. Conclusion; References; Chapter 3: Extracellular Matrix Molecules; 3.1. Introduction; 3.1.1. Overview 3.1.2. Extracellular Matrix Proteins3.1.3. Crosslinking; 3.2. Collagens;

model; 2.3. Epithelial-mesenchymal interactions during odontogenesis;

3.2.1. Collagen Biosynthesis and Processing; 3.2.2. Fibril-Forming Collagens; 3.2.2.1. Biomineralization; 3.2.3. Fibril-Associated Collagens (FACITs); 3.2.4. Network-Forming Collagens; 3.2.5. Anchoring Fibrils; 3.2.6. Other Collagens; 3.2.7. Collagenopathies; 3.2.7.1. Osteogenesis Imperfecta (OI); 3.2.7.2. Ehlers-Danlos Syndrome; 3.2.7.3. Skeletal Dysplasias and Chondrodysplasias; 3.2.7.4. Other Collagenopathies; 3.3. Glycoproteins; 3.3.1. Fibronectin; 3.3.2. Fibrillins and Latent TGF-ß-Binding Proteins (LTBPs) 3.3.2.1. Structural and Functional Properties of Fibrillins and LTBPs3. 3.2.2. Fibrillinopathies; 3.3.3. Fibulins; 3.3.4. Other Glycoproteins; 3.3.4.1. Tenascin; 3.3.4.2. The Small Integrin-Binding Ligand N-Linked Glycoproteins (SIBLINGs); 3.3.4.3. Thrombospondins; 3.4. Elastin and Elastic Fibers; 3.4.1. Elastic Fiber Assembly; 3.4.2. Elastin-Associated Pathologies; 3.5. Basement Membranes; 3.5.1. Laminins; 3.5.2. Collagen Type IV: 3.5.3. Basement Membrane Proteoglycans: 3.5.4. Basement Membrane-Associated Pathologies; 3.6. Proteoglycans and Glycosaminoglycans; 3.6.1. Glycosaminoglycans 3.6.2. Proteoglycans 3.6.2.1. Cell Surface Proteoglycans; 3.6.2.2. Modular Proteoglycans; 3.6.2.3. Small Leucine Rich Proteoglycans (SLRPs); 3.7. Concluding Remarks; Acknowledgments; Abbreviations; References: Chapter 4: Cell-Matrix Interactions and Signal Transduction; 4.1. Introduction; 4.1.1. The First Evidence that Matrices Change Cell Behavior; 4.1.2. Integrin and Non-Integrin Receptor Discovery: 4.2. Receptors: 4.2.1. Integrins: Mediators of Cell-Matrix Interactions; 4.2.1.1. Integrin a Subunits; 4.2.1.2. Integrin ß Subunits; 4.2.2. Non-Integrin Receptors for ECM Molecules 4.2.2.1. Syndecans

Sommario/riassunto

Stem Cell Biology and Tissue Engineering in Dental Sciences bridges the gap left by many tissue engineering and stem cell biology titles to highlight the importance of research in this field in the dental sciences. It compiles basic embryology and developmental biology with keen focus on stem cells, basic cell and matrix biology with relevance to tissue regeneration and repair, biomaterials (including nanotechnology) and current applications in various disciplines of dental science. Tissue engineering is an interdisciplinary field of biomedical research-which combines life, engineering, and ma