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Nota di contenuto	Preface; Contents; Editor and Contributors; 1 The Hematopoietic Stem Cell Niche: Cell-Cell Interactions and Quiescence; 1 Introduction; 2 Cell-Cell Interactions; 2.1 Endothelial Cells; 2.2 Mesenchymal-Derived Cells of the Hematopoietic Stem Cell Niche; 2.2.1 Chemokine Ligand 12 Expressing Cells; 2.2.2 Nestin Expressing Cells; 2.2.3 Osteoblasts; 2.2.4 Leptin-Receptor Expressing Cells; 2.2.5 CD146 Expressing Cells; 2.2.6 Bone Cartilage Stromal Progenitor Cells; 3 Other Niche Cells; 3.1 Megakaryocytes; 3.1.1 Non-myelinated Schwann Cells; 3.1.2 Monocytes/Macrophages 3.1.3 Sympathetic Nervous System4 Hematopoietic Stem Cell Niche Structure and Physiology; 4.1 Integrins; 4.2 Wnts; 4.3 Hypoxia; 4.4 Energetics; 5 Intrinsic Regulators of Cell Cycle; 6 Conclusions; Acknowledgments; References; 2 The Mammalian Limbal Stem Cell Niche: A Complex Interaction Between Cells, Growth Factors and Extracellular Matrix; 1 Introduction; 2 Defining the Limbus as the Residence Site for Corneal Stem Cells; 3 The Limbus: Its Structure and Composition; 3.1 Corneal Epithelial Stem Cells and Their Niche: Cells that Interact with the Limbal Stem Cell Reservoir 3.1.1 Epithelial Cells3.1.2 Melanocytes; 3.1.3 Langerhans' Cells; 3.1.4 Stromal Cells; 3.1.5 Corneal Innervation; 3.2 Corneal Epithelial Stem

Cells and Their Niche: Basal Membrane and Extracellular Matrix Components; 3.3 Corneal Epithelial Stem Cells and Their Niche: Growth Factors and Cytokines; 4 The Niche as Regulator of Limbal Stem Cells; 5 Corneal Epithelial Stem Cells: Renewal and Wound Healing; 6 Limbal Stem Cells and Therapy; 7 Conclusion; Acknowledgements; References; 3 Emerging Engineering Strategies for Studying the Stem Cell Niche; 1 Introduction; 2 Stem Cells and Their Niches 3 Stem Cell-ECM Interactions 3.1 Stem Cell Adhesion to Niche ECM via Integrins; 3.2 Cadherins, Another Class of Adhesion Receptors; 3.3 Molecular Sequestering of Growth Factors and Cytokines by ECM; 4 Seminal Engineering Strategies---Establishing a Foundation; 4.1 Micro/Nanofabrication Techniques for Generating Pre-Printed Topographies; 4.2 Micropatterning Techniques to Relate Stem Cell Shape to Behavior; 4.3 Soft Matter Hydrogel Systems with Predefined Characteristics; 5 Second Generation Engineering Strategies---Increased Complexity with a Focus on Spatiotemporal Control 5.1 Biomaterials with Tunable Properties 5.2 Spatiotemporal Control over Topography; 5.3 Spatiotemporal Control over Matrix Stiffness; 5.4 Dynamic Control of Integrin-Based Focal Adhesions; 6 Dissecting Cell-Cell Interactions within the Stem Cell Niche; 7 Early Approaches for Studying Stem Cell-Niche Cell Interactions In Vitro; 7.1 Patterned Bulk Stem Cell Co-Cultures; 7.2 Patterned 3D Stem Cell Co-Cultures; 8 Shifting Focus to Single-Cell Resolution and Artificial Niches; 8.1 Microfluidic Approaches for Single-Cell Co-Cultures; 8.2 Artificial Stem Cell-Niche Cell Signaling Approaches 9 Conclusions and Future Directions

Sommario/riassunto

This comprehensive volume explores functions, pathologies, and applications of stem cells in relation to the niches in which they develop. Ten chapters cover the subject in depth, from a historical perspective through signaling, hormonal control, quiescence, biomimetics, epigenetics, engineering strategies for emulating, tumorigenesis and more. The chapter authors represent a broad range of international expertise and perspectives. This installment of the popular *Stem Cell Biology and Regenerative Medicine* series delivers authoritative, international perspectives on this rapidly growing field. *Biology of Stem Cell Niche* is an ideal complementary volume to *Tissue-Specific Stem Cell Niche and Adult Stem Cells, Second Edition* and will be invaluable to clinicians and researchers working with stem cells as well as to postgraduate trainees who are studying them.
