

Preface

I N 1988, RICHARD CLARK AND PETER HENSON co-edited the book *The Molecular and Cellular Biology of Wound Repair* that masterfully summarized the then cutting-edge knowledge on mechanisms of wound healing. A second edition was subsequently published in 1996, yet there has not been an update since then. In the meantime, the field has experienced a meteoric technological rise and matured significantly. As a community, we have accumulated vast amounts of new knowledge regarding the fundamental concepts underlying tissue repair, the cellular players in healing and their molecular regulation, and more recently the cellular heterogeneity across multiple compartments of healing wounds. We have also learned how wound-specific cell states become reprogrammed to contribute toward effective repair. Importantly, we have begun to understand how the default “crisis-managing” mode of wound repair, when rapid restoration of tissue integrity is prioritized over anatomical and functional tissue complexity, can be reshaped toward wound regeneration, in which essential skin structures such as hair follicles and adipocytes are restored de novo within the wounds. We also have a better understanding of the factors that steer the wound-healing process toward pathologically delayed or impaired states, as seen in patients suffering from chronic, nonhealing wounds or excessively scarring wounds. Significant recent development in the fields of biomaterial sciences and organic chemical synthesis has resulted in numerous technological advances, which have enabled the production of next-generation wound dressings that can actively modulate endogenous or transplanted cells toward clinically beneficial outcomes. Furthermore, we are starting to get a glimpse into how individual cell types and molecular pathways come together in a multiscale and dynamic system that directs and executes all phases of wound healing.

This book, representing a collective effort of many—though regretfully not all—leading laboratories in the field, starts with chapters that discuss fundamental molecular and cellular principles governing wound healing. It then moves on to discussions of the roles of various cell types and commensal microbes in wound healing. Subsequent chapters focus on current knowledge of regenerative healing, wound healing defects commonly encountered in clinical settings, as well as emerging cellular, molecular, and bioengineering strategies aimed at promoting faster and optimized healing outcomes.

We thank Richard Sever at Cold Spring Harbor Laboratory and Kathleen Green at Northwestern University for their wonderful idea of putting together this book, and Barbara Acosta and her colleagues at Cold Spring Harbor Laboratory for guiding the entire process and for their patience along the way. We truly appreciate many members of the wound healing community for the insightful conversations and discussions, which both motivated us and helped shape the content of this volume. We thank all the authors who have taken time to write chapters that collectively resulted in a book with not only breadth but also depth on various important and emerging issues of wound healing research. We sincerely hope that this book will serve as an outstanding resource for readers who seek a comprehensive and up-to-date understanding of where the wound healing field stands and where it will go next.

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