BIOENGINEERING IN WOUND HEALING
A Systems Approach

Edited by Martin L Yarmush (Rutgers University, USA & Harvard Medical School, USA) & Alexander Golberg (Tel Aviv University, Israel)

Key Features:
• Comprehensive coverage of wound healing for bioengineers and scientists
• Contributors are leaders in wound healing research and technology
• First-of-its-kind: An introductory book on wound healing for bioengineers
• Multidisciplinary approach: Covers topics on medicine, biology, psychology, and engineering

Description:
What is a wound, how does it heal, and how can we prevent scarring? The concept of wound healing has puzzled humans even before the advent of modern medicine.

In this new, exciting and interdisciplinary book, its contributors address multiple questions related to the anatomy, biology, and metabolism of wound healing, and discuss cutting-edge bioengineering tools that diagnose and treat wounds.

In recent years, bioengineering has tackled the problems of cancer, tissue engineering and molecular manufacturing. The broad spectrum of technologies developed in these fields could potentially transform the wound care practice. However, entering the world of wound healing research is challenging — a broad spectrum of knowledge is required to understand wounds and improve healing.

This book provides an essential introduction of the field of wound healing to bioengineers and scientists outside the field of medicine. Written by leading researchers from various fields, this book is a comprehensive primer that gives readers a holistic understanding of the field of wound biology, diagnostics and treatment technologies.
Contents:

• Dedications
• Introduction from Editors (Alexander Golberg & Martin Yarmush)
• Scarless Tissue Regeneration (Alexander Golberg)
• Anatomy of the Skin and Wound Healing (Amit Sharma, Labib R Zakka & Martin C Mihm Jr.)
• Developmental Biology of Skin Wound Healing: On Pathways and Genes Controlling Regeneration versus Scarring (Sarah Susan Kelangi and Marianna Bei)
• Deprived and Enriched Environments: How Sensory Stimulation Affects Wound Healing (Jonathan G Fricchione & John B Levine)
• Nutrition, Metabolism and Wound Healing Process (Yong-Ming Yu & Alan J Fischman)
• Models of Ischemic and Vascular Wounds (Michael T Watkins & Hassan Albadawi)
• Polarization Sensitive Optical Coherence Tomography for Imaging of Wound Repair (Martin Villiger & Brett Bouma)
• Functional Imaging of Wound Metabolism (Vasily Belov, Jake Jones & Kyle P Quinn)
• Functional Skin Substitutes — The Intersection of Tissue Engineering and Biomaterials (Kevin Dooley, Julie Devalliere & Basak Uygun)
• Biomaterial-Based Systems for Pharmacologic Treatment of Wound Repair (Mara A Pop, Julia B Sun & Benjamin D Almquist)
• Laser Tissue Welding in Wound Healing and Surgical Repair (Russell Urie, Tanner Flake & Kaushal Rege)
• Bioprinting for Wound Healing Applications (Aleksander Skardal, Sean Murphy, Anthony Atala & Shay Soker)
• Electroporation Applications in Wound Healing (Laure Gibot, Tadej Kotnik & Alexander Golberg)