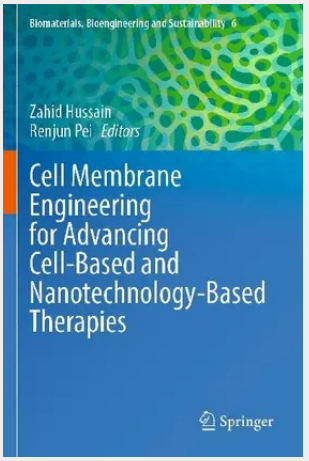
Hussain / Pei

Cell Membrane Engineering for Advancing Cell-Based and Nanotechnology-Based Therapies



The battle against complex diseases and tissue defects drives innovation in treatment and medical research. The cell membrane plays a fundamental role in biological processes and serves as a promising platform for diagnostic and therapeutic advancements due to its diverse receptors and ligands. Recent advances in bioengineering, synthetic biology, and biomimetic nanotechnology have enabled the development of engineered cell membrane-based platforms, including surface-engineered cells, extracellular vesicles, bacterial membrane vesicles, membrane-coated nanoparticles, and hybrid nanomaterials, offering improved therapeutic and diagnostic potential over their natural counterparts. This book provides a comprehensive exploration of essential cell surfaceome components, detailing state-of-the-art surface engineering strategies and advancements in engineered cells and membrane-based therapeutic nanoplatforms. It examines the transformative applications of these platforms in immune engineering, gastrointestinal disease management, cancer therapy, tissue engineering, circulating tumor cell capture, theranostics, and the treatment of neurodegenerative, inflammatory, and infectious diseases. Significant topics, many at the forefront of scientific research, are examined in depth, allowing academics, clinicians, and biomedical researchers to understand the latest advancements in cell membrane engineering and address unmet clinical needs. Furthermore, this interdisciplinary book is highly relevant to modern healthcare and provides instructional content for graduate students in chemical biology, pharmacology, biomaterials science, biomedical engineering, immune engineering, nanobiotechnology, regenerative medicine, and translational medicine. This book brings together pioneering research to inspire a broad scientific audience and drive innovation in disease monitoring, precision treatment, and biomedical applications.

The battle against complex diseases and tissue defects drives innovation in treatment and medical research. The cell membrane plays a fundamental role in biological processes and serves as a promising platform for diagnostic and therapeutic advancements due to its diverse receptors and ligands. Recent advances in bioengineering, synthetic biology, and biomimetic nanotechnology have enabled the development of engineered cell membrane-based platforms, including surface-engineered cells, extracellular vesicles, bacterial membrane vesicles, membrane-coated nanoparticles, and hybrid nanomaterials, offering improved therapeutic and diagnostic potential over their natural counterparts. This book provides a comprehensive exploration of essential cell surfaceome components, detailing state-of-the-art surface engineering strategies and advancements in engineered cells and membrane-based therapeutic nanoplatforms. It examines the transformative applications of these platforms in immune engineering, gastrointestinal disease management, cancer therapy, tissue engineering, circulating tumor cell capture, theranostics, and the treatment of neurodegenerative, inflammatory, and infectious diseases. Significant topics, many at the forefront of scientific research, are examined in depth, allowing academics, clinicians, and biomedical researchers to understand the latest advancements in cell membrane engineering and address unmet clinical needs. Furthermore, this interdisciplinary book is highly relevant to modern healthcare and provides instructional content for graduate students in chemical biology, pharmacology, biomaterials science, biomedical engineering, immune engineering, nanobiotechnology, regenerative medicine, and translational medicine. This book brings together pioneering research to inspire a broad scientific audience and drive innovation in disease monitoring, precision treatment, and biomedical applications.

246,09 €
246,09 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783031934278
Medium: Buch
ISBN: 978-3-031-93427-8
Verlag: Springer
Erscheinungstermin: 20.07.2026
Sprache(n): Englisch
Auflage: Erscheinungsjahr 2026
Serie: Biomaterials, Bioengineering and Sustainability
Produktform: Kartoniert
Gewicht: 803 g
Seiten: 511
Format (B x H): 155 x 235 mm

Kundenservice Verlag Dr. Otto Schmidt KG
Neumannstraße 10, 40235 Düsseldorf | kundenservice@otto-schmidt.de | 0221-93738-997 (Inland)