

Bacterial Membranes

Structural and Molecular Biology



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Membranes are pivotal components of life acting as formidable insulators that demarcate a living cell, generate energy in the form of ion gradients, transport ions, proteins, nucleic acids, nutrients and metabolites, and provide transduction systems to sense the environment and to communicate with other cells. Membranes also provide shape and structure to cells and are important in cell motility. In addition they fulfil a scaffolding function for proteins and organelles that interact with the extracellular environment.

Written by specialists in the field, this book provides a comprehensive overview of the structural and molecular biology of cellular processes that occur at or near bacterial membranes. The authors present and discuss recent progress on the function and involvement of membranes in bacterial physiology enabling a greater understanding of the molecular details of the cell envelope, its biogenesis and function. Topics covered include: cell wall growth, shape and division, the outer membrane of Gram-negative bacteria, outer membrane protein biosynthesis, bacterial lipoproteins, mycobacteria, lipid composition, ABC transporters, transport across the outer membrane, drug passage across membranes, bacterial membrane proteins, secretion systems, signal transduction, signalling mechanisms, bacterial membranes in adhesion and pathogenesis, and membranes as a drug target.

This cutting-edge text will provide a valuable resource for all those working in this field and is recommended for all microbiology libraries.

Chapter 1. Bacterial Cell Wall Growth, Shape and Division. *Adeline Derouaux, Mohammed Terrak, Tanneke den Blaauwen and Waldemar Vollmer*

Chapter 2. The Outer Membrane of Gram-negative Bacteria: Lipopolysaccharide Biogenesis and Transport. *Paola Sperandeo, Riccardo Villa, Gianni Dehò and Alessandra Polissi*

Chapter 3. Outer Membrane Protein Biosynthesis: Transport and Incorporation of OM Proteins (in)to the OM bilayer. *Kelly H. Kim, Suraaj Aulakh and Mark Paetzel*

Chapter 4. Bacterial Lipoproteins; Biogenesis, Virulence/Pathogenicity and Trafficking. *Hajime Tokuda, Peter Sander, Bok Luel Lee, Suguru Okuda, Thomas Grau, Andreas Tschumi, Juliane K. Brülle, Kenji Kurokawa and Hiroshi Nakayama*

Chapter 5. The Fascinating Coat Surrounding Mycobacteria. *Mamadou Daffé and Benoît Zuber*

Chapter 6. The Role Of Lipid Composition on Bacterial Membrane Protein Conformation and Function. *Vinciane Grimard, Marc Lensink, Fabien Debailleul, Jean-Marie Ruyschaert and Cedric Govaerts*

Chapter 7. Bacterial ABC Transporters: Structure and Function. *Anthony M. George and Peter M. Jones*

Chapter 8. Energy-coupled Transport Across the Outer-membrane of Gram-negative Bacteria. *Volkmar Braun*

Chapter 9. The Permeability Barrier: Passive and Active Drug Passage Across Membranes. *Kozhinjampara R Mahendran, Robert Schulz, Helge Weingart, Ulrich Kleinekathöfer and Mathias Winterhalter*

Chapter 10. Targeting and Integration of Bacterial Membrane Proteins. *Patrick Kuhn, Renuka Kudva, Thomas Welte, Lukas Sturm, and Hans-Georg Koch*

Chapter 11. Envelope Spanning Secretion Systems in Gram-negative Bacteria. *Matthias J Brunner, Rémi Fronzes and Thomas C Marlovits*

Chapter 12. Signaling Mechanisms in Prokaryotes. *Mariano Martinez, Pedro M. Alzari and Gwénaëlle André-Leroux*

Chapter 13. Outer-membrane-embedded and -associated Proteins and their Role in Adhesion and Pathogenesis. *Vincent van Dam, Virginie Roussel-Jazédé, Jesús Arenas, Martine P. Bos and Jan Tommassen*

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