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Nota di contenuto	Bacterial and Eukaryotic Porins; Contents; Preface; References; List of Contributors; 1 Regulation of Porin Gene Expression by the Two-component Regulatory System EnvZ/OmpR; 1.1 Introduction; 1.2 The Structure of EnvZ; 1.3 Biochemical Activities of EnvZ underlie Signaling; 1.4 What is the EnvZ Activity Regulated by the Stimulus?; 1.5 How is the Signal Propagated?; 1.6 Is there a Role for Acetyl-phosphate in OmpR-P Production?; 1.7 The OmpR Subfamily; 1.8 OmpR Binding Sites; 1.9 Recruitment of RNA Polymerase to OmpR-dependent Promoters; 1.10 OmpR-RNAP Interaction Surface 1.11 Affinity Model of Porin Gene Regulation 1.12 A Test of the Affinity Model; 1.13 Conformational Changes in OmpR Contribute to Differential Regulation of the Porin Genes; 1.14 Other Factors that Regulate ompF and ompC; 1.15 OmpR is a Global Regulator; 1.15.1 Flagellar Biosynthesis; 1.15.2 Curli Fimbriae Production; 1.15.3 Virulence; Acknowledgments; References; 2 The Structures of General Porins; 2.1 Bacterial Outer Membrane Proteins; 2.2 Construction of General Porins; 2.3 Trimer Association and Folding; 2.4 Pore Geometry; 2.5 Permeation; 2.6 Conclusion; Acknowledgments; References

3 Role of Bacterial Porins in Antibiotic Susceptibility of Gram-negative Bacteria 3.1 Introduction; 3.2 Role of Porins in Antibiotic Resistance; 3.2.1 Evolution of Clinical Isolates; 3.2.2 Expression of a Modified Porin; 3.3 In Vitro Mutagenesis Analyses of Porins and Modeling; 3.3.1 Mutations in the Loop 3 Domain; 3.3.2 Mutations in the Anti-loop 3 Domain; 3.3.3 Modeling of  $\beta$ -Lactam in the OmpF Eyelet; 3.4 Conclusion; Acknowledgments; References; 4 Porins of the Outer Membrane of *Pseudomonas aeruginosa*; 4.1 Introduction; 4.2 The Outer Membrane Permeability Defect in *P. aeruginosa* 4.3 Porins Identified in the Genome Sequence 4.4 The General Porins; 4.4.1 OprF; 4.4.2 Other General Porins; 4.5 Efflux; 4.5.1 OprM; 4.5.2 OprM Homologs; 4.6 Specific Porins; 4.6.1 OprB; 4.6.2 OprP and OprO; 4.6.3 OprD; 4.6.4 OprD Homologs; 4.7 TonB-dependent Receptors; 4.7.1 FpvA; 4.7.2 FptA; 4.7.3 PfeA and PirA; 4.7.4 HasR, PhuR and OptI; 4.7.5 Other TonB-dependent Receptors; 4.8 Conclusions; Acknowledgments; References; 5 Regulation of Bacterial Porin Function; 5.1 Introduction; 5.2 Voltage Dependence; 5.2.1 L3 and the Constriction Zone; 5.2.2 Extracellular Loops 5.2.3 Modulation of Voltage Gating 5.3 Effect of pH; 5.4 Polyamine Modulation; 5.5 Others; 5.6 Concluding Remarks; Acknowledgements; References; 6 Reconstitution of General Diffusion Pores from Bacterial Outer Membranes; 6.1 Introduction; 6.2 Planar Lipid Bilayer Technique; 6.3 Intrinsic Properties of General Diffusion Channels; 6.3.1 Single-channel Analysis of OmpF Gating; 6.3.2 Molecular Origin of Voltage Gating; 6.3.3 Effect of Membrane Composition and OmpF-LPS Interactions; 6.3.4 Open-channel Conductance; 6.3.5 Voltage Effect and Channel Orientation; 6.3.6 Ion Selectivity 6.3.7 The Permeating Cations Interact with Specific Elements along the Ionic Pathway

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#### Sommario/riassunto

This first book dedicated to the topic relates the known physiological functions of porins to their molecular structure and mechanism, as documented by various in vitro and in vivo methods, including the generation of null mutants in mice. For the first time, it brings together biophysical evidence with studies performed in a cellular context, presenting a unified picture of the fundamental importance of porins for cellular function. With 16 contributions by an interdisciplinary team of leading porin researchers, this reference is essential reading for every molecular or structural biologist.

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