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Nota di contenuto	Microbial Transport Systems; Preface; Contents; List of Authors; Color Plates; 1 Families of Transporters: A Phylogenetic Overview; 1.1 Introduction; 1.2 The TC System; 1.3 The Value of Phylogenetic Classification; 1.4 Phylogeny as Applied to Transporters; 1.5 The Basis for Classification in the TC System; 1.6 Classes of Transporters; 1.7 Class 1: Channels/Pores; 1.8 Class 2: Electrochemical Potential-driven Porters; 1.9 Class 3: Primary Active Transporters; 1.10 Class 4: Group Translocators; 1.11 Class 8: Accessory Factors Involved in Transport 1.12 Class 9: Incompletely Characterized Transport Proteins1.13 Transporters with Dual Modes of Energy Coupling; 1.14 Transporters Exhibiting More than One Mode of Transport; 1.15 Conclusions and Perspectives; References; 2 Energy-transducing Ion Pumps in Bacteria : Structure and Function of ATP Synthases; 2.1 Introduction; 2.2 Overview; 2.3 Structure, Configuration, and Interaction of F(1) Subunits;

2.4 Catalysis: Structural and Mechanistic Implications within the F(1) Complex; 2.5 The F(1)/F(O) Interface: Contact Sites for Energy Transmission

2.6 Structure, Configuration, and Interaction of F(O) Subunits

2.7 Catalysis: Coupling Ion Translocation to ATP Synthesis; References; 3 Sodium/Substrate Transport; 3.1 Introduction; 3.2 Occurrence and Role of Na(+) /Substrate Transport Systems; 3.2.1 General Considerations; 3.2.2 Elevated Temperatures; 3.2.3 Na(+) -rich Environments; 3.2.4 High pH; 3.2.5 Citrate Fermentation; 3.2.6 Na(+) /Substrate Transport in Escherichia coli; 3.2.7 Osmotic Stress; 3.3 Functional Properties of Na(+) /Substrate Transport Systems; 3.3.1 General Considerations; 3.3.2 MelB; 3.3.3 PutP; 3.3.4 CitS

3.4 Transporter Structure

3.4.1 General Features; 3.4.2 MelB; 3.4.3 PutP and Other Members of the SSF; 3.4.4 CitS; 3.5 Structure -Function Relationships; 3.5.1 MelB; 3.5.1.1 Site of Ion Binding; 3.5.1.2 Sugar Binding and Functional Dynamics of MelB; 3.5.2 PutP; 3.5.2.1 Site of Na(+) Binding; 3.5.2.2 Regions Important for Proline Binding; 3.5.2.3 Functional Dynamics of PutP; 3.5.3 CitS; 3.6 Concluding Remarks and Perspective; References; 4 Prokaryotic Binding Protein-dependent ABC Transporters; 4.1 A Brief History of ABC Systems; 4.2 What is an ABC System?

4.3 The Composition of the Prokaryotic ABC Transporters

4.4 Associated Proteins and Signal Transduction Pathways; 4.5 The Components; 4.5.1 The Binding Proteins; 4.5.1.1 Substrate Recognition Sites are High-affinity Soluble Binding Proteins; 4.5.1.2 The Binding Test; 4.5.1.3 Special Examples; 4.5.1.4 Binding Proteins Undergo Conformational Changes upon Binding Substrate; 4.5.1.5 The Crystal Structure; 4.5.2 The Integral Transmembrane Domains (TMDs); 4.5.2.1 Organization; 4.5.2.2 Composition and Structure; 4.5.2.3 The Interaction of the TMDs with the Binding Protein; 4.5.2.4 The Sequence

4.5.3 The ABC Subunit

## Sommario/riassunto

Transport of molecules across the cell membrane is a fundamental process of all living organisms. It is essential for understanding growth, development, nutrition as well as uptake and excretion of exogenous or synthesized molecules. Microbes represent general and basic functional systems where many transport processes have been studied on a molecular basis. Knowledge of the microbial transport processes will provide new perspectives to treatments by inhibitors, drugs, antibiotics, vitamins, growth promotion compounds, activators and toxic compounds of various kinds.