

Book review

Mechanism and Regulation of Carbohydrate Transport in Bacteria: by MILTON H. SAIER, JR., Academic Press, Orlando, FL, 1985, xviii + 209 pp., \$39.00, £ 39.00.

The book is divided into 8 chapters: (1) Introduction, (2) Mechanisms of carbohydrate transport, (3) Group translocation catalyzed by the phosphoenolpyruvate:sugar phosphotransferase system, (4) Mechanisms of inducer exclusion, (5) Mechanisms of adenylate-cyclase regulation in Gram-negative bacteria, (6) Involvement of bacterial protein kinases in the regulation of carbohydrate transport and metabolism, (7) Exogenous induction of certain carbohydrate permeases in bacteria, and (8) Permease classification and mechanism: conclusions and future perspectives. There is a bibliography containing over 350 entries, and an index.

The author states that the book is an update of a review article by S. S. Dills, M. R. Schmidt, and M. H. Saier, Jr., in *Microbiol. Rev.*, 44 (1980) 385-418. This is demonstrated both by the emphasis on the mechanisms of regulation of carbohydrate transport and the literature cited, where ~60% of the references are for 1980-1985.

The monograph is well written, with a continuity of style and viewpoint that is difficult to obtain in the multiauthored volumes that are so often encountered. Chapters 2 and 3 provide an excellent, current summary of carbohydrate-transport mechanisms; here, the author covers, with examples, (1) facilitated diffusion, (2) proton symport, (3) sodium symport, (4) primary active transport, and an excellent discussion of (5) group translocation (the phosphoenolpyruvate:sugar phosphotransferase system). The focus of chapters 4 and 5 is on recent research on regulatory processes responsible for the exclusion and uptake of inducers. The author discusses repressors, the interaction of activators and the cyclic AMP receptor-protein, and the transport systems involved in both inducer uptake and regulation of adenylate cyclase. The emphasis here is on transcriptional control, and interaction of small molecules with macromolecular effectors. Some of the genetic studies (*e.g.*, of the *mal* regulon) are also treated.

Chapter 6 describes the significance of protein kinases in the regulation of carbohydrate transport. Chapter 7 deals with the problem of how the bacterial cell manages to control the synthesis of certain permeases for such carbohydrates as 3-phosphoglycerate or citrate, which are normally present in the cell in significant concentrations. Here, much of the information presented is based on genetic studies.

The text contains over 40 Figures and about 15 Tables which are, generally, a helpful supplement. The references appear in a single bibliography, a somewhat

annoying practice, but their format is such that a page can be readily scanned to find the one(s) sought. I should have liked to see in the bibliography a reference to the text page(s) on which the citation occurs.

The book will be of interest both to students and researchers who wish to acquire a current, focused reference on the various mechanisms and regulatory control of sugar transport in bacteria.

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