

that are drawn from the 1970-to-1975 literature and still deserve citation. The dates in the bibliographies confirm my impression that most of the book was drafted before 1975. Recent developments have tended to restructure the known results into a more concise, theoretically simple framework than is evident here. In particular, linear inverse theory, which has become a key tool in modern seismology, is not covered.

In short, Ben-Menahem and Singh have produced a formidable work that succeeds beyond normal expectation in covering most aspects of the subject consistently and well.

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Proopiomelanocortin Peptides

ACTH and LPH in Health and Disease. T. B. VAN WIMERSMA GREIDANUS and L. H. REES, Eds. Karger, Basel, 1981. x, 210 pp., illus. \$79.25. *Frontiers of Hormone Research*, vol. 8.

This monograph provides a timely and comprehensive review of the proopiomelanocortin (POMC) peptide system and its involvement in normal and diseased states. POMC is the precursor protein to ACTH and LPH. The system is interesting in that it involves several different hormones: adrenocorticotropin, β -endorphin, and α , β , and γ melanocyte-stimulating hormone. In addition, the protein is expressed in a large variety of tissues, such as the intermediate and anterior pituitary, hypothalamus, gut, and placenta, and factors regulating the synthesis and secretion of POMC-related peptides vary depending upon the expressing tissue.

The comprehensive nature of this book makes it useful in understanding the involvement of these peptides in both normal and diseased states. Because of the complexity of the system, no subject is treated in depth; however, the major subjects are discussed, and the basic literature is cited in all cases.

The contributors succeed in identifying the complexities of regulation in this system, which stem from its being polyhormonal. There is also discussion of the synergistic activities of many of the hormones. Often the biological activity of one of the POMC peptides is modified by one of the other hormones derived from the common precursor. This is a newly

recognized fact, which will become increasingly important as more polyhormonal systems are described.

The book also deals with quantitating the hormones in plasma. In the POMC system, where there is substantial immunological cross-reactivity between the various hormones owing to the various melanotropin sequences, it is important to understand the exact regions of the hormone that are recognized by the antibody in the radioimmunoassay. Several papers deal with the idea that plasma POMC-related peptides can be derived from tissues other than pituitary, particularly in the case of ectopic tumors.

There is an extensive review of the involvement of the POMC-related peptides in the central nervous system. Although the hypothalamus appears to be the primary site of synthesis of brain POMC peptides, they have been localized in a variety of different regions, having most likely been brought there by axonal transport. The effects of POMC peptides in the central nervous system on pain and behavior are discussed.

Of particular interest is the extensive treatment of the anatomical connections between the brain and the pituitary. There is an enlightening section on blood flow in the pituitary-hypothalamic system. The possibility of pituitary-stalk retrograde blood flow is discussed critically, as are other mechanisms for the delivery of pituitary hormones to the brain. The description of the blood flow in this region leaves one with the idea that the POMC peptides from the intermediate lobe may be involved in regulating the anterior lobe in a manner analogous to that by which the anterior lobe is regulated by the hypothalamus.

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Antibiosis

The Future of Antibiotherapy and Antibiotic Research. Papers from a conference, Paris, Feb. 1980. L. NINET, P. E. BOST, D. H. BOUANCHAUD, and J. FLORENT, Eds. Academic Press, New York, 1981. xx, 508 pp., illus. \$60.

This book is a compilation of 31 papers by 44 participants in the Second Rhône-Poulenc Round Table, which had as its stated objectives an evaluation of current knowledge of antibiotic activity, resistance, and mechanisms of action

and an analysis of future requirements in antimicrobial therapy. The conference brought together a large group of experts on antibiosis whose collected presentations and discussions provide important and valuable information to anyone interested in the field.

The book is in four parts. In the first part a series of papers devoted to current patterns of susceptibility and the emerging resistance of aerobic, facultatively anaerobic, and anaerobic bacteria, though it does not provide particularly novel information, sets the stage for papers on the ecology of transferable resistance by Richmond and Petrocheilou and the surveillance and audit of antibiotic usage by Kunin (the latter providing a rather detailed description of an approach to this newest requirement by the Joint Commission on Accreditation of Hospitals). Of special interest in this part is a series of papers on the uses of antibiotics in veterinary medicine and in animal feeds, including a reasonably dispassionate and nonpolitical assessment of the benefits for food production, which are significant, and the risk to humans of the latter practice, which has not been documented.

The second part of the proceedings addresses various approaches to the evaluation of new antibiotics in vitro and in vivo. Included in this part are papers on the selection of strains for susceptibility testing (Chabbert), the assessment of inhibitors of cell wall (Tomasz) and protein (Vazquez) biosynthesis, and the potential importance of the effects of antibiotics on bacterial adhesion (Chabanon). The novel aspect of this part of the proceedings is that it takes a molecular approach to determining the action and effects of antibiotics. The effort to develop new antibiotics now can focus on those agents that are able to suppress or overcome the mechanisms of microbial resistance that have been identified to date (Davies).

The third part of the book deals with various approaches to the development of new antibiotics, including screening of organisms for antibiotic production, genetic recombination, and directed biosynthesis. The final part contains general discussions by Richmond, Davies, and Demain.

At the conclusion of the book, one is left with a contingent of participants who strongly support continuing efforts to develop new antibiotics with activity against an ever-mounting tide of resistant bacteria and another contingent who argue that the existing armamentarium of antibiotics is sufficient but requires more rational and better utilization. Although

the latter argument has considerable merit, there is little evidence that surveillance and audit of antibiotic use has corrected physicians' prescribing habits or their well-documented abuse of antibiotics. Misuse or abuse of antibiotics has contributed to the high incidence of microbial resistance in infections acquired both in and out of the hospital and requires further development of new compounds able to eradicate organisms with seemingly more sophisticated mechanisms of resistance.

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Bacterial Adherence

Adhesion and Microorganism Pathogenicity. Papers from a symposium, London, May 1980. Pitman, London, 1981 (U.S. distributor, Medical Education Administration, Ciba Pharmaceutical Company, Summit, N.J.). x, 346 pp., illus. \$35. Ciba Foundation Symposium 80.

In essentially any environment where both microorganisms and solid surfaces occur, some of the microbes will attach to the surface and may subsequently proliferate and colonize it. This phenomenon has interesting, and frequently serious, implications in a wide range of habitats, including natural waters, soil, industrial containers and pipelines, and plant and animal hosts. This book of symposium proceedings deals specifically with the role of attachment of microbial pathogens in disease but should be fascinating reading for anyone interested in microbial attachment to surfaces.

The papers are roughly organized into three groups. The first group deals with mechanisms of microbial adhesion and includes papers on the attachment of mycoplasmas to inert surfaces and eukaryotic cells, of amoebae to eukaryotic cells, of bacteria to mucosal surfaces and cell-surface sugars, and of viruses to plant protoplasts. The second group deals with the pertinent question of whether adhesion is a dominant factor in pathogenicity, and the significance of adhesion to the pathogenicity of *Escherichia coli*, *Neisseria gonorrhoeae*, malaria merozoites, and chlamydiae (obligate intracellular parasites) is discussed. The third group deals with the ways in which disease may be prevented by inhibiting microbial adhesion and includes papers on aspects of the molecular basis for adhesion, such as the surface glycoproteins of myxoviruses and paramyxo-

viruses and the effects of glycoprotein synthesis or sublethal concentrations of antibiotics on bacterial adhesion. The main facts of these papers are then summarized in a table.

For the most part the papers are of excellent quality, but the real strength of the book lies in the discussions that follow each paper and in the general discussions of the use of glycolipids in receptor assays, streptococcal adherence, terminology, the nature of receptors, other factors affecting adhesion, the relevance of models, and clinical implications. The interchange between participants not only clarifies the answers to questions but also defines subjects for future research. For example, concerning the attachment of streptococci to eukaryotic cells, one participant refers to evidence suggesting that lipid moieties of lipoteichoic acid of streptococci are available for interaction and hypothesizes that the lipoteichoic acid is bound to bacterial surface proteins by hydrogen bonds, thus allowing the lipid ends to flip open as a host membrane approaches and to interact with receptor sites. Such a hypothesis could also help to explain a number of hydrophobic interactions that have been observed between apparently hydrophilic bacteria and hydrophobic surfaces in a range of habitats other than animal hosts. However, none of the other participants can provide theoretical or experimental support for the hypothesis, which only provokes further questions. Other stimulating questions touched on in the papers and explored during the discussions are whether there are examples of mixed bacterial infections where one species promotes or inhibits adhesion of another and whether adhesiveness could be a disadvantage to the pathogen by increasing its potential for interaction with phagocytic cells.

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