

Book reviews

Connective Tissue: Macromolecular Structure and Evolution, by M. B. MATHEWS, Springer-Verlag, Berlin, Heidelberg, New York, 1975, xi + 318 pages, DM78, \$32.

This volume is the 19th in a series entitled Molecular Biology, Biochemistry and Biophysics. During the past decade, knowledge concerning the biology of the extracellular matrices of animal connective tissues has increased enormously. Various aspects of extracellular matrices have been reviewed in many excellent articles, but this has led to a dispersal of information and a tendency to lose sight of the main aim, *i.e.*, to find out how connective tissues work. The publication of this book is very timely in bringing together data, up to 1974, on the molecular structures of the principal extracellular components of connective tissues, namely, collagen, elastin, structural glycoproteins, and polyanionic proteoglycans. Because the true function of each component is only realized when all the components are assembled together in tissues, the inter-relationships between them at the molecular level and at higher levels of organization existing in tissues are considered. The connecting thread which runs through the book is the question of how these tissues evolved. This has involved assembling much data from a wide range of invertebrates and vertebrates, and looking for broad, biological principles that unify the structures and properties of all connective tissues. The author is to be complimented on the way he has organized these data and the speculations regarding the evolution of collagen-polyanionic matrices. These speculations are stimulating and should lead to much discussion and further research.

The first two chapters are introductory, and the succeeding ones are concerned with collagen, elastin, and structural glycoproteins, respectively. The present reviewer does not always entirely agree with some of the conclusions arrived at by the author. For example, in the section on cross-links in collagen (Chapter 3, p. 19), there is little evidence that the reducible cross-links (dehydrohydroxylysinoxidation products and dehydrodihydroxylysinoxidation products) are actually stabilized by reduction during aging. Also, the participation of histidine in collagen cross-linking is controversial. In Chapter 4, which deals with elastin, no mention is made that the lysyl-derived aldol is an important cross-linker in elastin. Also, this chapter could, perhaps, have been usefully expanded by giving more information about resilin and abductin, which are the elastin counterparts in the ligaments of insects and bivalves, respectively. Chapters 6, 7, 8, and 9 deal with polyanionic proteoglycans, a description of their structures in cartilage, bone, notochord, and other tissues, and the development and effects of aging on structures in vertebrate cartilage. Obviously, the polyanionic proteoglycans are the main interest of the author. Chapter 10 deals with the molecular inter-relationships of the matrix molecules and their function in tissues. The final

chapter gives the author's conclusions regarding the evolution and development of connective tissues.

The author is a distinguished and respected research worker in the field of connective tissue who has made notable contributions, especially towards knowledge concerning the structures of polyanionic proteoglycans. He has written an excellent book that can be highly recommended to all those interested in connective tissues.

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Synthetic Procedures in Nucleic Acid Chemistry. Volume 2; Physical and Physico-chemical Aids in Characterization and in Determination of Structure: edited by W. WERNER ZORBACH and R. STUART TIPSON, Wiley, New York, 1973, x+674 pp., \$ 35.00.

This book is complementary to Volume 1 of this series, which collated important preparative methods in nucleic acid chemistry. The following physical methods are reviewed by experts in each field: determination of ionization constants, ultraviolet spectroscopy, gas-liquid chromatography, mass spectrometry, optical rotatory dispersion, infrared spectroscopy, nuclear magnetic resonance spectroscopy, X-ray crystallography, and chromatography. Each chapter contains a brief description of the theory of the method, but the emphasis is on application, and detailed descriptions of practical procedures are given. The literature is covered to 1968 or 1969.

There are some differences in format between volumes 1 and 2; for example, volume 2 is set in typewriter face and has no Author index. Misprints and inconsistencies of style are also numerous, particularly in the chapter on chromatography, although these are trivial and unlikely to mislead. Of physical methods not covered by this volume, electrophoresis is perhaps the most noteworthy omission, and could merit a short account in a future volume in conjunction with the section on chromatography. However, these are minor criticisms, and the editors are to be congratulated in again producing a work which is essential reading for nucleic acid chemists, besides containing much of interest for workers in allied fields.

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