Book Reviews

Biology of Spermatogenesis and Spermatozoa in Mammals

S.S. Guraya
Springer-Verlag, Berlin, 1987
430 pp.
Price: DM 298 (hard cover)

In this book the author undertakes to integrate and critically review the vast body of research on cellular and molecular biology of spermatogenesis and spermatozoa in mammals. The book is divided into two parts, the first covering spermatogenesis and the second covering the spermatozoon and each part is broken down into a number of chapters. Chapter 1 is a general review of the structure of the seminiferous epithelium and includes discussion of the basic spermatogenic cycle and an excellent section on the structure and function of the Sertoli cell. Chapters 2 and 3 cover the structure and biochemistry of spermatogonia and spermatocytes respectively, and the fourth chapter deals with the spermatid and spermiogenesis. Chapter 4 includes discussion of the process of chromatin condensation and change in nuclear shape, the origin and function of the chromatoid body, the structure of the Golgi body and development of the acrosome, the development of the manchette and its possible role in shaping the sperm head, and finally spermiation and the fate of the residual cytoplasm. The final chapter of the first part describes the changing nature of the antigenic cell membrane components and briefly discusses their possible function in the control of spermatogenesis.

The second part, on the mature spermatozoon, begins with a brief introductory chapter which is followed by separate chapters describing the head, neck, cytoplasmic droplet, and tail. Together, these chapters cover 125 pages and they represent a thorough review of the biology of the spermatozoa. The discussion of the head (nucleus and acrosome) has a biochemical bias which reflects the current trend in research. The chapter on the neck, which is structurally the most complex part of the spermatozoon, is surprisingly short and has a morphological bias. The chapter on the tail is well balanced and includes discussion of the axoneme complex and its function, the structure of the mid-piece and sperm metabolism, and brief discussions of the origin and function of the annulus, and the structure of the main-piece and end-piece. The penultimate chapter reviews the current information on the spermatozoon plasma membrane and its surface components and covers the distribution of intramembranous particles, enzymes, surface charge, antigens and lectin-binding sites. Chapter 12 examines sperm motility and briefly covers the mechanism of sperm motility and discusses in detail the energetics of, and the effects of chemical and physical agents on sperm motility.

There is an extensive reference list of over 2500 entries which have the form of author, date, journal, volume, and first page. A number of these references are from relatively obscure journals and many readers will be grateful for this introduction to a previously unknown data source. The exhaustive referencing however results in my one major criticism which is that the text becomes hard to follow as most statements are supported by long lists of references. There is an excellent subject index with extensive cross referencing. The book has relatively few figures (85), most of which are redrawn from previous publications and a few of which are out of focus (Figures 4 and 40). The only significant error that I came across is on page 25 where the reference to Figure 7 should be to Figure 11.

In spite of the few minor criticisms there is no doubt that the author's undertaking has been achieved and this book will become a standard reference for workers in the field.

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Muscle: Design, Diversity, and Disease

John M. Squire
The Benjamin/Cummings Publishing Company, Inc., Menlo Park, California 1986
381 pp.

This book is a well-written, carefully organized text containing a great deal of information on muscle. It is, however, too detailed for the use of medical (or allied medical) practitioners, who may deal with muscle disorders. Instead, it should prove to be of great value to muscle physiologists, biochemists, histologists, microbiologists and zoologists.

Throughout the text, the reader is guided from the earliest, basic ideas of the structure and function of muscle to the latest theories. The author develops the argument logically, giving précis of the related experimental evidence. His use of cross-referencing within the text and of heavy print to high-light new or particularly relevant terms, and his concise style of writing hold the reader's attention and promote understanding.

Clear explanations and a critique of the major techniques in use today are given, with suggestions for

future goals of muscle research proposed, both of which are of interest and value to the researcher.

Summaries are only included at the ends of some chapters (viz. 1,3,4,7). These would be of value after each chapter, serving to emphasize the salient points discussed, particularly in those sections containing much, and complicated information. The list of references given at the end of each chapter of the book, pertaining to the specific section being discussed or reviewed, should be very useful. Similarly, the bibliography given at the end of the book will give the researcher guidelines in starting his/her reading in this field.

The text is well illustrated with relevant diagrams, electron micrographs, pictures of X-ray diffraction patterns, figures and tables. However, the clarity of some of these illustrations (e.g. Figures 1.2, 2.5a-d, 2.6 a & c, 7.4) may be enhanced by enlarging them; or by the judicious use of colour, although the cost of this may prove prohibitive. The quality of some of the electron micrographs (e.g. Figures 1.9, 7.7a, 9.8a, 10.6b, 10.8b, 10.17) is poor. They are too dark or lack contrast, which defeats their purpose. There are better electron micrographs available, and should have been used in this book instead.

To justify the title of the book, Chapter 10 should have been more extensive in its coverage of muscle disease and disorders. This would serve to make the book more attractive to those clinicians and muscle biologists who may be interested in muscle research more for the purpose of helping to relieve human suffering.

Apart from these few, minor criticisms, this book offers a very good, broad spectrum of knowledge of muscle structure and function. I would certainly recommend its use to all those interested in, starting out or involved in research in this field. This is the kind of book that I would have liked to have been available to me when I was involved in muscle research.

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