NEW ATLAS OF HISTOLOGY

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Light microscopy, histochemistry and electron microscopy

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PREFACE

In recent years the teaching of a laboratory course in Histology has become more complex because of the new methods that have permitted to expand into the chemical and ultrastructural organization of cells and tissues. While traditionally based on the study of the structures observed with the light microscope, the development of modern histochemical techniques has enabled us to localize many of the main cellular components thus allowing a better correlation with their function. On the other hand, in the last two decades, the technical advances in electron microscopy have permitted to reach the submicroscopic level and even to reveal changes that are produced at a macromolecular level during the functioning of the cell. Such developments are also the basis of modern Pathology since at such levels of organization a disease merely represents a further variation from the normal.

To this increased complexity, which implies the use of techniques and of costly equipment which may be unavailable in some Chairs of Histology, we have to add the recent tendency to shorten the time allowed for teaching in the laboratory. It is evident that although there is no substitute for the direct observation of the slides, with routine or special histochemical techniques, and of the original electronmicrographs, an Atlas in which the various subdivisions of Histology are presented in an orderly manner would be considerably useful both to the student and teacher.

This NEW ATLAS OF HISTOLOGY, based on morphology, histochemistry and ultrastructure was designed to meet the needs we have encountered to teach an ever increasing number of students. Its originality resides in the fact that in every chapter the three basic aspects of Histology are integrated. The presentation of morphology is based on color reproductions of drawings from the usual preparations. They correspond to a combination of different microscopic fields in which the proportions and mutual relationships are maintained. Some plates also give a tridimensional apreciation of the structures. In each case a systematic description of each drawing is given in which are emphasized the main elements used to arrive to a reasoned diagnosis.

The histochemical reactions represented by color micrographs of specifically stained preparations; the techniques of radioautography using labelled isotopes and fluorescence, for the localization of cellular antigens, and the specific enzymic reactions are discussed in detail. These methods localize essential chemical cellular components, such as nucleic acids, lipids, steroids, mucopolysaccharides and enzymes. Brief descriptions give the principles of the techniques, the most important concepts that arise from them, and how these correlate with the histophysiology of each cell or tissue.

The ultrastructural study is represented by electron microscope photographs which illustrate the intracellular structural organization at several magnifications, from the morphology of organelles to that of the macromolecules that compose them. The observation of these cellular components, ranging from 10 to 2,000 angstrom units in size, at a level where Molecular and Cellular Biology converge, make electron microscopy the most powerful instrument in morphological analysis. The description of every electron micrograph points out the most important submicroscopic structures and the functional correlations that they suggest.

Such an ambitious enterprise could not have been completed without generous collaboration. The drawings and diagrams which illustrate the morphologic sections have been done for the most part by Professor Celia M. Ishii de Sato; we would particularly like to point out her skill in accurately reproducing the structures. The retouching of the micrograph reproductions was also done by Professor de Sato. Most of these drawings are taken from the ATLAS OF HUMAN HISTOLOGY by one of us (Dr. Mariano S.H.Di Fiore). The histochemical preparations were mainly made in the Chair of Histology of Professor R.E. Mancini with the help of Prof. O. Vilar and Drs. A. Barket and L. Tres. Some of the-illustrations were also contributed by Prof. E. De Robertis. The electron microscopy, under Prof. E. De Robertis, has benefited from the kind collaboration of Professor David Zambrano and Amanda Pellegrino de Iraldi, with the efficient technical help of Mrs. Lina de Stein. Dr. T.A. Reader, also from this chair, collaborated in the english version of this edition.

We also acknowledge the Publishers "El Ateneo" for the great effort they have put into the publication of this Atlas. It is a pleasure to acknowledge once more the help of those who contributed a great deal to previous editions: Mr. Segundo Domingo Torres, for the diagrams; Mr. José Moreno Soria for the graphic coordination. Finally the lay-out of this book is mainly due to the skill of the staff of Artes Gráficas Planeta, directed by Mr. Nicolás Rubino.

Mariano H. Di Fiore
Roberto E. Mancini
Eduardo De Robertis

PREFACE OF THE THIRD EDITION

The main lines of thought mentioned in the Preface of the first edition of the New Atlas of Histology have been reassured by the excellent reception of this book, not only in the English version, but also in its translations into Spanish, Portughese and Italian. Thus, it was demonstrated that an integration in the morphological histochemical and ultrastructural study of the cells and tissues is the right approach in modern Histology.

In this new edition additions and replacements of plates have been made which represent a considerable improvement. The figure of the Patches of Peyer of the intestine has been replaced and new drawings have been added which represent: the juxtaglomerular complex (kidney); the tubuli recti, the rete testis and ductuli efferents (testicle); the colliculus seminalis (prostate gland); the corpus luteum and the atretic follicles (ovary); the mamary gland at the seventh month of pregnancy and during lactation; and general fields of the thyroid and parathyroid glands. Plates 6 and 7 corresponding to the ultrastructure of the cell have been replaced by others that illustrate better the various cell organelles. Another addition is and electron micrograph corresponding to the alveolar-capillary wall of the lung, across which the exchange of oxygen and carbon dioxide is produced. Furthermore the entire text has been revised and several errors, which unfortunately were in the former editions, were corrected.

October, 1978

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