Antigen Retrieval Techniques: Immunohistochemistry and Molecular Morphology


Antigen Retrieval Techniques is a timely overview of antigen and nucleic acid retrieval methods currently in use or under investigation in the practice of immunohistochemistry and in situ hybridization.

The book is divided into 5 sections plus 2 introductory chapters and an appendix, covering basic theory, a sampling of applications, and a discussion of standardization issues.

More specifically, section I summarizes current theory on the mechanism of formalin fixation and relates the application of the theoretical concepts to techniques that rely on the preservation of structure at the molecular level. A history of the development of methods to revive or enhance immunohistochemical reactivity of antigens follows. Commonly referred to as antigen retrieval (AR), and usually consisting of heating the sample in some type of aqueous solution, AR is used in a variety of ways in different laboratories and is comprehensively summarized in this chapter (complete with 91 references). A second chapter briefly reviews studies in which the basic parameters of AR methodology, such as heat, pH, chemical composition, and concentration, have been systematically manipulated.

The next 2 sections consist of 11 chapters, each presenting a particular technical approach or area of application. The variety of articles presented, although not all-inclusive, does represent a good sample of interesting applications. Some of the topics covered include proliferation markers in both histologic and cytologic specimens, AR for immunoelectron microscopy, steroid hormone receptor techniques (namely estrogen and progesterone receptors in breast cancer), AR in neuroscience, target retrieval for in situ hybridization, and methods for evaluation of expression of tumor suppressor proteins. There is, however, no detailed chapter on hematopoietic markers here or elsewhere in the book.

Section IV presents 3 chapters dealing with both the issue of standardization of methods and a technique of combining AR with another interesting method, signal amplification, which is not as widely used at present. These are 2 quite distinct topics that will be of interest to some individuals.

Section V consists of 2 chapters on retrieval methods for resin- and cell-culture-embedded tissue specimens, based on chemical or enzymatic treatment of the tissue without heating.

Finally, in a 22-page appendix with 116 references, the volume closes with a summary of the most commonly used methods for AR, plus useful hints on troubleshooting.

For the most part, the photographs are excellent and informatively captioned. There are 16 color plates in the middle of the book, each of which is reproduced in black and white at the appropriate point in the text.

Pathologists and pathology residents will find some parts of the book more useful or interesting than other parts. Technologists and those engaged in research in related areas would benefit from reading the entire book. For anyone using immunohistochemistry or in situ hybridization routinely, the book is well worth having for the variety of methods and references it provides. To see this important methodology presented in such theoretical and practical depth is very encouraging and should serve to stimulate interest in and further development of these very useful techniques.

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Tumors of the Gallbladder, Extrahepatic Bile Ducts, and Ampulla of Vater

By Jorge Albores-Saavedra, Donald Earl Henson, and David S. Klimstra (Atlas of Tumor Pathology, 3rd series, fascicle 27, 365 pp., with illus, Washington, DC, Armed Forces Institute of Pathology, 2000.

After 14 years, the long-awaited sequel to the second edition of the fascicle Tumors of the Gallbladder and Extrahepatic Bile Ducts has arrived. At the suggestion of the editor, Dr Juan Rosai, the authors have logically added tumors of the ampulla of Vater in this third series, because tumors of these anatomic sites share similar clinical and pathologic features. In this fascicle, the authors have achieved their goal of updating the information on the clinical and pathologic characteristics as well as the biologic behavior of tumors that arise in this anatomic region. Particular emphasis is given to useful diagnostic light microscopic features and, when appropriate, to results of electron microscopy, immunohistochemistry, and molecular pathology studies. The authors take full advantage of recent technological advances and provide impeccable color images that seamlessly supplement the well-written text. The result is a publication of unparalleled quality on this subject.

Following the format of the third series of Armed Forces Institute of Pathology fascicles, this volume begins with a comprehensive review of the anatomy and embryologic development, followed by a detailed discussion of the different tumors of the gallbladder, extrahepatic bile ducts, and ampulla of Vater. Each subject is discussed based on topics that include definition and general features, clinical features, gross findings, pathologic findings, and differential diagnosis. Each chapter ends with a complete list of pertinent references.
When necessary, colorful schematic illustrations and radiologic studies, including cholangiography, sonography, and computed tomography, have been added. Histologic classification, TNM tumor staging system, prosecution of the pancreateoduodenectomy specimen, and information that must be included in the surgical report are detailed. The role and limitations of cytology and image analysis in the diagnosis of tumor are discussed. The authors have provided different perspectives on the histologic distribution and survival rates for cancers of the gallbladder, extrahepatic bile ducts, and ampulla based on the data from the Surveillance, Epidemiology, and End Results Program of the National Cancer Institute. These are contrasted with the authors' own experiences in various cancer institutes. Comparing the data from the different sources is difficult, a fact that emphasizes the need for uniformity in nomenclature.

Particularly impressive are the colorful gross photographs and whole-mount glass slides in the newly added chapter on malignant epithelial tumors of the ampulla. The AJCC/UICC (American Joint Committee on Cancer/Committee of the International Union Against Cancer) staging system for ampullary carcinoma is accompanied by monochromatic illustrations that supplement the text. This chapter also includes comparable survival rates in a tabular format, based on the experiences of different authors.

The authors of the 365-page third series of Tumors of the Gallbladder, Extrahepatic Bile Ducts, and Ampulla of Vater have continued the AFIP's tradition of producing fascicles that have become among the most influential publications on tumor pathology.

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**Handbook of Lipoprotein Testing**


This second edition continues a tradition of increasingly diverse updates in this expanding field of interest. Methods for Clinical Laboratory Measurement of Lipids and Lipoprotein Risk Factors in 1991 and Laboratory Measurement of Lipids and Lipoproteins and Apolipoproteins in 1994 were followed by the first edition of this handbook in 1997. The fourth book in the series updates not only with a discussion of the lipid-related topics in previous versions, but also with some nonlipid atherosclerotic risk factors.

This 819-page soft-covered book has its 38 chapters divided into 3 major sections. The first is “Atherosclerosis and its Prevention” (8 chapters). This section reviews the pathophysiology of the atherosclerotic process, pre-analytical variation of the lipid components, and the diagnosis and treatment of lipid disorders. In addition to the usual risk factors, this section has a brief overview of homocysteine and high-sensitivity C-reactive protein. The second section (26 chapters), “Laboratory Aspects of Lipids, Lipoproteins, and Apolipoproteins,” constitutes the bulk of the handbook. The topics range from more common—the analysis of the traditional lipid moieties through apolipoproteins and lipid oxidation—to less common aspects—lecithin-cholesterol transferase protein, low-density lipoprotein (LDL) receptors, and nonesterified fatty acids. The discussion of some lipid constituents focuses almost entirely on clinical issues, with only a few sentences or a paragraph indicating the methodologies available. On the other hand, some citations describe the analytical steps in a very detailed fashion—including the technique of washing cuvets. Of particular interest is the in-depth discussion of small, dense LDL particles—their clinical significance and analysis. The third section (4 chapters), “Standardization and Regulatory Issues,” covers the difficult issues involved with standardizing the simpler lipid constituents (cholesterol and triglycerides) as well as the great need for reliable materials and methods for more complex constituents. Matrix effects, which often confound the analyses, are also considered.

There are 68 contributors to this tome, including many luminaries in the lipid field. Among them are a pioneer of cholesterol assays, Bennie Zak; the Centers for Disease Control’s Gerald Cooper; and Russ Warnick, innovator in many areas of lipid determinations. Most chapters have lists of reasonably up-to-date references, some as recent as 2000. The chapter on lipoprotein (Lp) (a) is notable for its extensive list of 346 references. The authors should be especially commended for not overemphasizing the clinical importance of some specific markers until evidence-based studies are available. An example is in chapter 16, with its review of 16 studies of atherosclerotic risk related to LDL particle size. The author concludes that the complexity of factors involved “make it difficult to determine an ‘independent’ risk of CHD [coronary heart disease] associated with small, dense LDL.” Likewise, in the chapter on lipoprotein (a), the authors in their summary state, “Currently the majority of measurements of Lp (a) concentration reported in clinical studies in the literature is confounded by isoform size, making it difficult to come to a sound conclusion regarding the role of Lp (a) concentration in disease.”

In spite of its title, this volume should not be expected to be a source of detailed methodology, the so-called recipes that are needed to set up assays in the laboratory. Other sources must be used. However, the breadth of subject matter and depth of the discussions require that every hospital laboratory and pathology resident program have this text available as a resource.

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**Head and Neck Pathology With Clinical Correlations**


The book is a comprehensive, detailed text that encompasses all aspects of head and neck pathology.
There are 4 main editors and 44 contributors.

The first 5 chapters are dedicated to general principles. The first chapter is an excellent summary of the current state of the art in cellular and molecular biology of cancer cells; the second and third chapters deal with epidemiology and ethical considerations. The fourth chapter is a detailed description of the human immunodeficiency virus and acquired immune deficiency syndrome in general and the related diseases involving the head and neck. The fifth chapter is a lengthy dissertation on the use of fine-needle aspiration biopsy in the diagnosis of head and neck disease.

The second part of the book contains chapters dedicated to the specific sites classically included in the subspecialty. Nasal and paranasal sinus, major salivary glands, larynx, hypopharynx and trachea, oral cavity, thyroid gland, parathyroid gland, ear and temporal bone, and neck are the sites on which the 8 chapters included in this section focus.

It is remarkable that in a book with 44 authors the language is uniform and clear. For each anatomic site, individual chapters review the clinical features and management, as well as the complete gross and microscopic features of each pathologic entity, including immunohistochemistry, molecular biology, and cytogenetic data. The information reflects the latest up-to-date references in the literature. The illustrations are of excellent quality, with abundant microscopic pictures.

This textbook of head and neck pathology should be extremely valuable to clinical otolaryngologists and pathologists; this reviewer strongly recommends its use for all practitioners involved in the care of patients afflicted with head and neck pathology.

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