PATHOLOGY is an inherently subjective discipline, and therefore is often referred to as both an art and a science. Over the years, laboratory physicians have implemented special tissue stains and molecular techniques to limit subjectivity in the discipline. Beginning in the late 19th century, histochemical stains were developed to assess diagnostic biochemical reactions in tissue. Histochemistry has recently seen a resurgence in popularity because of the higher costs of other newer methods. Today, this technique is used by almost every pathology laboratory across the world. This book comprehensively covers all diseases for which that technique plays a central role in diagnosis. Every anatomic region is covered in detail with examples of appropriate staining techniques, and the book is heavily illustrated with more than 850 color photomicrographs. This is the first monograph to be published on histochemistry in 15 years, and it is the only one that is diagnostically oriented.

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DIAGNOSTIC HISTOCHEMISTRY

Edited by

Mark R. Wick, M.D.

University of Virginia, Charlottesville
To

JANE, ROBERT, & MORGAN,

who allowed me to take time from them
to spend on completing this volume.

And, to all of my teachers in Pathology,
who long ago gave me a sound foundation in laboratory science
and stimulated my interest in Histochemistry.
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READERS (OR BROWSERS) OF THIS TEXT may have opened it with the expectation that the title was not completely accurate, and that immuno-histochemistry would be at least one of the subjects it considered. That assumption is incorrect. The book you have in your hands is devoted to histochemistry, and that discipline alone, as it applies to anatomic pathology.

Why histochemistry, in the twenty-first century? will be the next question. Surely, with the current availability of immunohistology, molecular diagnostics, cytogenetics, proteomics, etc., one can obtain needed diagnostic information through a variety of other technological avenues. That statement is true enough, but it does not mean that one should discard older disciplines simply because they are no longer novel.

The application of histochemical methods to diagnostic pathology has a long and rich history. It began in the late 1800s, linked to such names as Ehrlich, Mallory, Koch, Heidenhain, Masson, Biebrich, Warthin, Bielschowsky, Rio de Hortega, and other greats in laboratory science. Advances in this area of study accrued steadily, and, up until roughly 1970, histochemistry was “state of the art” for anatomic pathologists. Even the growth of electron microscopy at that point did not significantly blunt the use of histochemical stains in pathologic diagnosis.

In the decade after that, however, the burgeoning availability of diagnostic immunohistochemistry did begin to eclipse histochemical applications in laboratory medicine. Slowly but surely, trainees in pathology—and their teachers—eschewed the daily use of the latter methods in favor of newer procedures. Knowledge concerning the mechanisms of histochemical stains—and the principles of tissue processing and tissue chemistry—began to evaporate in the collective consciousness of pathologists. Thus, today, practitioners may know the names of a few stains that are not immunologically based, but they usually have very little detailed understanding of how the stains are done, what their biochemical bases are, or what their case-based applications can be.

Hence, we come to the reason for this book. The editor firmly believes that no area of scientific endeavor should be forgotten or abandoned if it still has utility and can add to diagnostic certainty. Furthermore, if effective older methods are quicker and cheaper than new ones, there is all the more reason to maintain their viability and implementation. Given the fact that automated commercial platforms are now available to produce histochemical preparations—as is also true of immunohistochemical ones—such stains can be done rapidly indeed. They are less expensive than most other evaluations in pathology, they are still reimbursed by the healthcare system, and, most importantly, they still add to diagnostic conclusions when used in the correct manner.

The format of this volume is quite different from that of preceding texts on histochemistry. They have typically focused only on the technical aspects of the stains in question, often adopting a “procedure manual”–like approach, with little or no discussion of practical applications. Instead, only a general discussion of the actual methodology of histochemistry is presented here; the main emphasis is on how the stains can be used in practice and what information they can provide. Authors of chapters in this book have been asked to provide several case-based presentations to further those goals.

Concerted efforts have been made to populate this text with good-quality color illustrations of various pathologic entities and corresponding stains that can be applied to them. However, it should be said that not all histochemical preparations readily yield themselves to the taking of perfect photographs, because of technical attributes of the stains themselves. Therefore, some forebearance of that fact is asked of readers.
For those who wish to have more technical details than those presented here—in line with those contained in past books on the topic—several of the latter are currently in print and they represent excellent procedural resources (1–3). In addition, a variety of Internet sites are devoted to histotechnological procedures and are additional valuable references (4–7).

The main goals of this presentation are to educate young pathologists on a subject with which they likely have only superficial familiarity, and to refresh the histochemical knowledge of more experienced practitioners. The staining techniques presented here are still worthy of clinical use on a regular basis, and they undeniably augment diagnostic information that can be obtained using other analytical evaluations.

References


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