Molecular basis of cardiovascular disease: a companion to Braunwald’s heart disease
Kenneth Chien; Philadelphia; 1999; W.B. Saunders; 630 pages; $135.00.

Molecular biologic techniques have facilitated many of the recent advances in our basic understanding of the pathophysiology of cardiovascular disease. These same techniques have allowed a variety of new treatments, including gene therapy, to be designed and evaluated in patients with cardiac and peripheral vascular disease. As such, Molecular basis of cardiovascular disease is a timely text that provides a comprehensive and up-to-date review of molecular biologic principles and their application to cardiovascular disease.

Vascular surgeons need to realize early on that the target audience for this text is the cardiologist. This is not a criticism because the book was designed as a companion to Heart disease: a textbook of cardiovascular medicine, authored by Eugene Braunwald. However, many of the chapters deal with disease processes that are of little interest to practicing vascular surgeons or even a surgeon who is interested in vascular biology. This is particularly true of the sections on cardiac morphogenesis, myopathies, and arrhythmias. Even the sections of the text that might be of interest to vascular surgeons (ie, “Vascular biology and atherogenesis”) are written with a focus on coronary artery disease and restenosis after coronary angioplasty. There is hardly any mention of the contributions made by vascular surgeons/scientists on vein graft adaptation. Issues that are specific to peripheral vascular disease are, for the most part, ignored. For example, there is little in this text about abdominal aortic aneurysms, with the exception of a few pages in the section on “Morphogenesis of cardiovascular disease” where the pattern of inheritance for aneurysms is discussed. This is unfortunate because there is a great deal of information now available about the pathogenesis and treatment of this disease process, much of which has been derived with molecular biologic techniques.

With this as my only reservation, I found the book to be practical and informative. The text is organized into seven sections. Section I, entitled “Principles of molecular cardiology,” is designed as a general introduction to molecular techniques as they relate to the study of cardiovascular disease. The first chapter, “General principles of molecular biology,” is a well-written, concise overview of basic molecular biology and molecular techniques. The chapters on gene transfer and genetically modified animal models are excellent, relevant, and written in a manner that allows the reader to understand the application of these techniques to cardiovascular medicine. Sections 2, 3 and 4, on “Morphogenesis and cardiovascular disease,” “Cardiac muscle and myopathies,” and “Cardiac conduction and arrhythmias” are, as previously mentioned, not particularly relevant to vascular surgeons. Section 5, entitled “Vascular biology and atherogenesis,” includes four chapters in which the topics of endothelium, atherogenesis, restenosis, and angiogenesis are addressed. The chapter on atherogenesis has inflammation and the contribution of white blood cells to the atherosclerotic process as its specific focus. As such, it does not provide the reader with a general overview of atherosclerosis. The chapter on restenosis is excellent, thorough, and well referenced, although it lacks information regarding the pathophysiology of vein graft stenosis. Sections 6 and 7 include well-written chapters in which risk factors for coronary artery disease and the molecular basis of hemostasis disorders are addressed.

The cast of contributors is extraordinary and includes scientific leaders, such as Jan Breslow, Robert Rosenberg, Judah Folkman, Michael Gimbrone, Jr, Peter Libby, and many more. Each chapter is either authored or coauthored by a well-established, national figure who has made a substantial contribution to cardiovascular biology. At the end of the text, there is a useful 21-page glossary in which commonly used terms that relate to molecular biology are defined in a practical manner.

Despite its emphasis on cardiac rather than peripheral vascular disease, I would recommend this book to surgeons who have an interest in vascular biology. The relevant sections are up to date and well written by renown authorities. I have already used this book as a reference on many occasions, and I plan to assign several of its chapters as required reading for new fellows entering the laboratory.

K. Craig Kent, MD
Division of Vascular Surgery
New York Presbyterian Hospital–Weill Medical College
Cornell University
New York, New York

Modern visualisation of the endothelium
J.M. Polak; Amsterdam; 1998; Harwood Academic; 243 pages; $85.00.

Modern visualisation of the endothelium is the fourth volume in a series entitled “The endothelial cell research series,” which aims to provide readers with reviews of basic and clinical research related to the endothelium. As the title suggests, the purpose of this text is to present the latest technical and conceptual advances in visualization of the endothelium and how they relate to the production of regulatory molecules in physiologic and disease states. The target audience as outlined by the authors includes cell biologists, anatomists, pathologists, biochemists and physiologists.
The book is broadly divided into three parts. The first part addresses the cytology, ultrastructure, and chemical mediators of normal endothelium. This section of the text offers extensive reviews of electron-immunocytochemistry of vasoactive agents, localization of mediators in the endothelium, neurovascular interactions, endothelial and matrix interactions, and a chapter on the renin-angiotensin system. Part two is entitled "Disease" but disappointingly deals only with two subsets of the endothelium in disease: inflammation and the modulation of the secretion of von Willebrand factor from endothelial cells. The final part of the text is called "Imaging." A chapter on in vivo imaging and how it correlates with endothelial morphology deals with intravascular ultrasound scanning and angioscopy. The inclusion of a section describing the widely used method of duplex ultrasound scanning to "visualize" endothelial dysfunction in humans would have been useful. The final chapter is an excellent review of targeted gene manipulation and gene transfer in studying the endothelium.

As with many multi-authored texts, the quality of the chapters varies, with some of the chapters being devoted almost exclusively to the author's research rather than a comprehensive review. Generally, however, the chapters are well written and complete. A particular strength of this text is that the references are exhaustive and up to date, particularly considering the speed at which this area of investigation is moving. The numerous figures depicting histology and cellular ultrastructure are clearly reproduced and well captioned. Despite the title, some of the chapters deal almost entirely with endothelial physiology and pathophysiology and say little about endothelial visualization, thus detracting from the cohesiveness of the text.

In summary, this is a valuable book, which includes current reviews of a topic that has not been extensively covered in the past 15 years. It is generally concise, readable, and complete. Although it is obviously not for all vascular surgeons, this book is to be recommended for those with an active basic research interest in vascular wall biology where they will find the references alone an invaluable resource.

Raymond Makoul, MD
Medical College of Virginia
Richmond, Va
Modern methods of computerized image analysis have been applied to reconstruct the endothelial layer in three-dimensions - detecting even the most subtle of changes. Within these covers, an integrated text has been gathered by experts in each of their fields. They detail the latest technical and conceptual advances in the visualization of endothelium, its production of regulatory molecules and pathological changes. Table of Contents. In book: Modern Visualisation of the Endothelium (pp.3-44). Chapter: 1. Publisher: Harwood Academic Publishers, Amsterdam. The distribution of vasoactive agents and nitric oxide synthase in endothelial cells of various vascular beds with special emphasis on cerebral blood vessels has been reviewed based on studies using polyclonal and monoclonal antibodies for immunohistochemical techniques and in particular immunolabelling techniques at the electron microscope level. The endothelial glycocalyx is a network of membrane-bound proteoglycans and glycoproteins, covering the endothelium luminally. Both endothelium- and plasma-derived soluble molecules integrate into this mesh. Over the past decade, insight has been gained into the role of the glycocalyx in vascular physiology and pathology, including mechanotransduction, hemostasis, signaling, and blood cell-vessel wall interactions. Assessing this possible role of the endothelial glycocalyx requires reliable visualization of this delicate layer, which is a great challenge. An overview is given of the various ways in which the endothelial glycocalyx has been visualized up to now, including first data from two-photon microscopic imaging.