

Preface

The vascular system in mammals provides a conduit for the transport of oxygen and vital nutrients to all tissues and cells of the body. Vascular disease results in malfunction or death of organs. It has been nearly 400 years since the English physician, William Harvey, described his revolutionary theory on the circulatory system. Interest has evolved from mere anatomical observations to the detailed scrutiny of the cellular and molecular mechanisms that underlie the pathophysiology of human vascular diseases and associated complications.

This book is a compilation of 18 papers presented by world experts on important aspects of vascular biology and the maintenance of normal blood vessel integrity and function and tone and common complications of vascular diseases. The papers were presented at a meeting held at the Royal College of Physicians in London on July 7, 2006, chaired by Professor Dame Carol Black. The aim of the meeting was to provide a forum where basic and clinical scientists, clinicians in several different specialties, and vascular surgeons, were able to discuss established and evolving parts of the jigsaw of this fascinating field of medical science.

This book is divided into six sections, bringing together key and contemporary areas in the study, pathogenesis, management, and treatment of some of the most common vascular diseases that affect humans. It includes discussions of approaches to gene therapy and aspects of regenerative medicine.

Section one starts with a retrospective account and visionary exploration of treatments for pulmonary vascular disease. It also focuses on the major endothelial-derived mediators, including nitric oxide, endothelin, and the TGF- β /BMP pathways that impact upon cardiovascular physiology, influencing both endothelial cell activity and smooth muscle cells responses, and cardiomyocyte function. Section two concerns the use of model systems to study and repair vascular dysfunction. These studies highlight the importance of the inflammatory response and the soluble and transcription factors that promote and modulate the characteristic vascular remodeling processes that take place following injury. Section three focuses on vascular complications of systemic disease, therapies for vasculopathy in connective tissue diseases, and transplant-related vasculopathy in the kidney. Surgical approaches to the management of

coronary bypass graft patency and saphenous vein harvesting for coronary artery bypass grafting and the medical treatment for peripheral vascular disease are presented in section four. Section five is concerned with the importance of, and evidence for lowering total cholesterol and LDL cholesterol in clinical practice with statins. Novel preclinical gene therapies to modulate lipid composition in vascular diseases are also reviewed. The final section is concerned with genetics, gene therapy, and tissue engineering for vascular diseases.

We believe that it is paramount that clinical specialists who look after patients with any form of vascular disease should understand relevant aspects of the basic scientific rationale for disease pathogenesis. We have therefore tried to present a “joined-up” review of our current understanding of what we think are the most important areas of clinical science and medicine in vascular disease and, we hope, identified areas for research in the future.

We hope that this book will be a useful reference to basic and clinical scientists—clinical specialists interested in this broad-ranging subject. We are very grateful to our authors who made the meeting very enjoyable and a great success, and who have provided authoritative chapters for this book.

William Harvey’s revolutionary theory has withstood the test of time. However, we do not, unfortunately, know which areas of current research that we present here will be similarly enduring. It is this uncertainty that excites those involved in this fascinating area of medical science and practice.

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