

PREFACE

Hammersmith Hospital [‘the Hammersmith’], and the former Royal Postgraduate Medical School, have a tradition of research in the field of the Pulmonary Circulation, stemming from the clinical research of Sir John McMichael and Paul Wood in the 1940s, and John Goodwin, Jack Shillingford, Celia Oakley and Robert Steiner in the 1950s and 1960s. John West’s pioneering studies on pulmonary haemodynamics and the distribution of pulmonary blood flow in the same period (1958–1969) used radioisotopic methods; expertise in angiographic (Chapters 9 and 13.1) and radionuclide studies (Chapter 5.2) continues. More recent research has focused on pulmonary vascular remodeling and the genetics of pulmonary vascular disease.

The pulmonary circulation is, in mammals, the largest of all the circulations and the vehicle of gas exchange for the whole body. It is exposed to alveolar hypoxia, on the one hand, and to the venous return from all other tissues, on the other. Thus, the pulmonary circulation ‘sees’ the metabolic, inflammatory and immunological products of all tissues, whether they are healthy or diseased. The microcirculation serves as a vascular filter for particulate matter, such as platelet aggregates and microemboli; in addition, the capillary endothelium and blood act as a metabolic filter, converting hormones and other signalling molecules (e.g. angiotensin I and nitric oxide, NO) into active or inactive states. The filtering function of the pulmonary circulation may lead to disease as in pulmonary embolic disease following the break-up of systemic venous thrombi.

As with other organ systems, there has been an explosion of knowledge in the last 20 years, particularly in the basic sciences. In section I of this book, we pull together the physiological knowledge and principles gained in the era 1950–1980 (Chapters 2 and 4, in the main) with the advances in the basic sciences from 1980 to the present day (Chapters 3 and 5–8). Section II (Clinical Practice) covers the investigation, pathogenesis and management of pulmonary hypertension, oedema and intrapulmonary shunting, with an emphasis on “disease mechanisms”.

Our aim is to provide a concise and illustrated “road-map” of each topic. For further reading, we have referred mainly to recent Review articles, but particularly relevant original publications are listed. The pulmonary circulation can be viewed in many different guises — genetic, developmental, anatomical, physiological, haemodynamic, cellular, signalling, remodelling, as well as a medium for gas and fluid exchange — in health and disease. This “Introductory Guide” aims to emphasize the many facets of pulmonary vascular biology and medicine.

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