

# Preface

The primary goal of this textbook is to provide an overview of cutting-edge and emerging topics in translational vascular medicine as seen by experts from diverse clinical and biomedical research backgrounds. The premise is to highlight the areas of investigation that are currently (or will be) the topics of keen interest to those practicing cardiovascular medicine or researching translational vascular biology. This book includes chapters on translational topics in vascular medicine that are commonly overlooked in research reviews and vascular medicine texts. Throughout the book, the authors communicate complex molecular mechanisms using easy-to-follow text that is complemented with valuable figures that illustrate the key topics. This textbook is intended for physicians, residents, fellows, and graduate students from a variety of specialties related to vascular disease.

This book is divided into two broad themes associated with molecular and translational vascular medicine. The first part includes chapters on recent advances toward understanding the pathogenesis of common vascular diseases and presents the unique contributions of molecular imaging to our understanding of their pathogenesis, as well as their diagnosis and treatment. Several chapters review recent insights into the genetics and molecular and cellular biology specific to aneurysms (Chap. 1), the vasculitides (Chap. 2), and venous thrombosis (Chap. 3). These are followed by a chapter more broadly applicable to vascular diseases that reviews recent progress in understanding the role of the ubiquitin proteasome system in modulating the pathogenesis of endothelial dysfunction (Chap. 4). The first part concludes with a chapter unique to most vascular medicine texts on the development of imaging modalities, and cellular and molecular probes, that hold promise to image the molecular and cellular pathogenesis of, and perhaps treat vascular diseases (Chap. 5).

The second part focuses on the evolving molecular- and cellular-based therapies under development and being used to diagnose and treat vascular disease. The first two chapters discuss recent insights into the mechanisms of vasculogenesis and angiogenesis and translation of this knowledge to treat critical limb ischemia (Chaps. 6 and 7). Next is a review of the pathogenesis of restenosis after arterial injury and the latest therapeutic options to modulate it (Chap. 8). This is followed

by a more detailed discussion of the evolving use of nanoparticle technology in vascular medicine as it applies to drug-eluting stents, as well as its potential to diagnose and treat other vascular diseases (Chap. 9). We conclude this part with a discussion of the current status and potential of emerging endothelial progenitor cell-based therapies for cardiovascular diseases (Chap. 10).

We believe that this book comprises a unique compilation of reviews that cover many of the exciting and current topics in translational vascular research and medicine. The translational focus of the book made it an enjoyable project, and we hope you find it informative and valuable.

Chapel Hill, NC, USA  
Chapel Hill, NC, USA

Jonathon W. Homeister  
Monte S. Willis



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(Eds.) J. W. Homeister; M. S. Willis

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