

# Preface

The heart is invested with a complex, intertwining network of blood and lymphatic vessels which, respectively, provide the cardiac tissue with oxygen and nutrients and eliminate excess fluid from the interstitium. The coronary blood vessels have been the focus of much investigation in the past few decades. On the other hand, the literature regarding the cardiac lymphatic vessels remains sparse, despite their important role in maintaining normal heart function. For example, in the event of lymphatic blockage, destruction, or dysfunction, cardiac edema as well as fibrosis and inflammation can be observed in the affected regions of the heart. With this in mind, a better understanding of the cardiac lymphatic network and its ability to regulate fluid homeostasis within the heart could give us insight into developing therapies for the alleviation of several cardiac pathological conditions.

This book aims to provide in-depth coverage of the cardiac lymphatic vessels and the essential nature of their patterning and development in the heart tissue. The volume is organized into three parts: the anatomy of the cardiac lymphatic system (Chaps. 1 and 2), the cardiac lymphatics and heart disease (Chaps. 3, 4, 5, 6, and 7), and cardiac lymphatic signaling (Chaps. 8, 9, 10, and 11). The first two chapters illustrate the general anatomy of the lymphatic vessels existing within the epicardium, myocardium, and endocardium of the heart. Chapter 3 investigates the role of the lymphatics in the development of congenital heart disease, while Chap. 4 reviews their function in a variety of cardiac pathologies including myocardial infarction and congestive heart failure. Chapter 5 covers the valvular lymphatics under both normal and disease conditions. Chapter 6 discusses some therapeutic applications targeting the cardiac lymphatics during heart disease as well as the limitations of such practices, and Chap. 7 outlines the various imaging modalities that are available for the visualization of the lymphatic vasculature. Chapters 8, 9, and 10 highlight certain crucial signaling pathways (Tie, VEGF, and HIF, respectively) that are involved in the regulation of the cardiac lymphatics. Finally, Chap. 11 delves into the potential of the epicardium to act as a source of stem cells for damaged or regenerating lymphatic vessels.

The volume will be useful to a broad audience interested in cardiovascular medicine and physiology, including clinicians, students, and researchers in the fields of

developmental biology, cardiology, and applied anatomy. The groundwork in this book will be able to provide readers with vital information on the crucial role played by the cardiac lymphatic vessels in preserving normal heart function.

My primary thanks go to the contributors, key leaders in the field, without whom this book would not have been possible. Their time and enthusiasm are greatly appreciated. I would also like to thank my family, especially my husband Matthew Krock, for their unwavering love and support during this project.

Cleveland, OH, USA

Ganga Karunamuni, PhD



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An Overview

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