

Preface

Oxidative stress is a product balance between pro-oxidants and antioxidants. Reactive oxygen species are normally generated by cells and a certain level of oxidative stress plays an important role as second messenger under physiological conditions. However when oxidative stress is increased, whether due to blunted antioxidant defenses or increased generation of reactive oxygen species, it can have a deleterious effect on almost any organ/system in the human. Increased oxidative stress has been shown to promote vasoconstriction, vascular remodeling, inflammation, and fibrosis in different organs. Specifically, as a result of the “oxidative stress modification hypothesis” increased oxidative stress has been directly related to the development of atherosclerosis and vascular disease. Abundant evidence mainly from experimental studies supported a pathophysiological role of increased oxidative stress on the development and progression of vascular disease, which have served as the impetus for many clinical studies to assess the impact of reestablishing oxidant balance in different vascular disease conditions. However, most of them have not provided conclusive or consistent results. Therefore, the relevance of oxidative stress as therapeutic target has been put into question as its pathophysiological role revised.

Many areas of research beyond oxidative stress have had trouble in translating preclinical studies to clinical studies. It is important to make sure that studies, both preclinical and clinical, have the intended hypothesis and are properly designed. Only then, accurate conclusions could be drawn. The goal of this book is to describe a roadmap of the knowledge in the area of oxidative stress and the development of vascular disease and to put in perspective where the scientific field is regarding the translation of preclinical knowledge to clinical trials.

In the first chapters of this book, we will examine the role of oxidative stress under physiological conditions. Subsequent chapters will address the relationship between oxidative stress and the development of vascular disease, and identify and discuss the background that led to clinical trials. The last part of the book will be dedicated to the clinical data that is currently available regarding interventions or

attempts to preserve oxidant stress under different conditions. The intention of this last section is to put into perspective the previous clinical studies, what answers they attempted to answer and why they may/may not have tested the intended hypothesis.

It is the hope of the Editors that this book will inspire scientists of many backgrounds to be involved in the field of oxidative stress and vascular disease.

Rochester, MN, USA
Jackson, MS, USA
Rochester, MN, USA

Martin Rodriguez-Porcel
Alejandro R. Chade
Jordan D. Miller

Studies on Atherosclerosis

Rodriguez-Porcel, M.; Chade, A.R.; Miller, J.D. (Eds.)

2017, XV, 138 p. 12 illus., 7 illus. in color., Hardcover

ISBN: 978-1-4899-7691-8