This volume is based on lectures given on the occasion of a symposium entitled Physiology and Pathophysiology of the Endothelium. The contributions review findings in this field, which are supplemented by the authors own research. The aim is to delineate the basic properties of the endothelium as it acts as selective barrier and specific mediator of solute transfer and cell permeation and as regulator of vascular tone, and to relate these properties to disease processes affecting micro- and macrocirculation such as diabetes, hypertension, atherosclerosis, inflammation and tumour metastasis. Accordingly, experimental areas usually considered as diverse were juxtaposed. In particular the endothelium was not only considered as a separate entity, but also in the context of its interactions with the blood and its components at the luminal side as well as the surrounding interstitium. Following an integrative rather than a reductionistic approach, this publication provides comprehensive information for all professionals in the field.