

**VASCULAR  
ENDOTHELIUM IN  
HEALTH AND DISEASE**

# **ADVANCES IN EXPERIMENTAL MEDICINE AND BIOLOGY**

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# VASCULAR ENDOTHELIUM IN HEALTH AND DISEASE

Edited by

**Shu Chien**

Institute of Biomedical Sciences  
Academia Sinica  
Taipei, Taiwan  
Republic of China

PLENUM PRESS • NEW YORK AND LONDON

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Library of Congress Cataloging in Publication Data

Vascular endothelium in health and disease / edited by Shu Chien.

(Advances in experimental medicine and biology; v. 242)

p. cm.

“Proceedings of the satellite symposium to the Fourth World Congress for Microcirculation on vascular endothelium in health and disease, held August 5-6, 1987, in Taipei, Taiwan, Republic of China” – T.p. verso.

Proceedings of the Symposium on “Vascular Endothelium in Health and Disease,” held at the Institute of Biomedical Sciences, Academia Sinica.

Includes bibliographies and index.

ISBN 978-1-4684-8937-8 ISBN 978-1-4684-8935-4 (eBook)

DOI 10.1007/978-1-4684-8935-4

1. Vascular endothelium – Pathophysiology – Congresses. 2. Vascular endothelium – Physiology – Congresses. I. Chien, Shu. II. Symposium on “Vascular Endothelium in Health and Disease” (1987: Institute of Biomedical Sciences, Academia Sinica) III. World Congress for Microcirculation (4th: 1987: Tokyo, Japan) IV. Series.

[DNLM: 1. Endothelium, Vascular – physiology – congresses. WI AD559 v. 242 / QS 532.5.E7 V3314 1987]

RC691.4.V37 1988

616.1'3 – dc19

DNLM/DLC

for Library of Congress

88-26583

CIP

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Proceedings of the Satellite Symposium to the Fourth World Congress for Microcirculation on Vascular Endothelium in Health and Disease, held August 5-6, 1987, in Taipei, Taiwan, Republic of China

© 1988 Plenum Press, New York

Softcover reprint of the hardcover 1st edition 1988

A Division of Plenum Publishing Corporation

233 Spring Street, New York, N.Y. 10013

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**Dedicated to my wife,  
Kuang-Chung Hu Chien, M.D.,  
and my colleagues at  
Institute of Biomedical Sciences, Academia Sinica,  
and  
Division of Circulatory Physiology and Biophysics,  
Department of Physiology and Cellular Biophysics,  
Columbia University College of Physicians and Surgeons**

## PREFACE

In recent years there has been rapid progress in research on vascular endothelium. This has led to significant advances in our understanding of the structure and function of vascular endothelium in health and disease, including such aspects as the permeability of endothelium in relation to its ultrastructural correlates, theoretical basis, regulatory factors, and role in atherogenesis; the interaction between endothelium and blood cells; the endothelial release and processing of a number of important physiological agents, such as eicosanoids, hemostatic factors, and histamine; the cell biology of endothelium with respect to the cytoskeletal apparatus, cell activation, and cell locomotion; and the role of endothelium in microcirculatory regulation in normal and pathophysiological circumstances.

A Symposium on "Vascular Endothelium in Health and Disease" was held on August 5-6, 1987, at the Institute of Biomedical Sciences, Academia Sinica, Taipei, Taiwan, Republic of China, following the 4th World Congress for Microcirculation in Japan. Experts working on various aspects of vascular endothelium came from all over the world to participate in this two-day Symposium and gave excellent presentations. This volume, embodying the proceedings of that Symposium, is a collection of the papers given by the speakers with, in many cases, further updating and new information added subsequent to the Symposium.

The Institute of Biomedical Sciences (IBMS), the site of this Symposium, is a newly established research institution, which has vascular endothelium as one of its areas of research emphasis. Its parent organization, Academia Sinica, celebrates its 60th Anniversary on June 9, 1988. The Republic of China, with its remarkable economic advances, is now making a major effort in upgrading its biomedical research. Therefore, the holding of this Symposium was timely and valuable. It provided an opportunity for local scientists to learn state-of-the-art research from leading workers on vascular endothelium. The publication of this volume will ensure the dissemination of important information to a wide audience and the promotion of interest in endothelial research everywhere in the world.

This book consists of 25 manuscripts grouped under seven topics, viz. Microvascular Permeability, Role of Endothelium in Atherogenesis, Leukocyte-Endothelium Interactions, Prostaglandins and Hemostatic Functions of Vascular Endothelium, Histamine and Endothelium, Cell Biology of Endothelium, and Tumor Microcirculation. Thus, it encompasses the major developments in endothelial research outlined above. On the one hand, the book covers the current advances in basic science research on vascular endothelium in breadth and depth, elucidating many important biological processes such as macromolecular permeability, fluid transfer, interstitial transport, cell-cell interaction, chemotaxis, cell locomotion, receptor binding, eicosanoid biosynthesis, thrombosis and hemostasis, and angiogenesis. On the other hand, it contains important information relevant to a variety of clinical conditions, e.g., atherosclerosis, inflammation, edema formation, coagulationopathies, peripheral vascular disorders, peptic ulcer, and cancer. Therefore, this book presents a collection of important information on vascular endothelium in health and disease, and should be valuable to scientists, clinicians, and students in many different disciplines, including angiologists, biochemists, bioengineers, biophysicists, cell biologists, electron microscopists, hematologists, internists, oncologists, pharmacologists, physiologists, surgeons, and others.

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Academia Sinica  
May 1988

## ACKNOWLEDGMENTS

The successful holding of this Symposium on Vascular Endothelium in Health and Disease and the publication of this proceedings volume have been made possible by the support and efforts of many organizations and individuals. I would like to thank Professor M. Tsuchiya and the organizers of the 4th World Congress for Microcirculation for making this a satellite symposium of the Congress, thus facilitating the participation of many world leaders in the field. The participants from abroad included the Present and Past Presidents, and Present and Past Secretaries General of several international learned societies, e.g. the Bioengineering Society (U.S.A.), the European Society for Microcirculation, the International Society of Biorheology, the Microcirculatory Society (North America), and the 4th World Congress for Microcirculation. The speakers and chairpersons are outstanding scientists from ten nations on four continents; their wonderful contributions to the Symposium and to this book are gratefully appreciated.

I wish to acknowledge with gratitude the support and encouragement of Academia Sinica (President: Dr. Ta You Wu), the Advisory Committee of the Institute of Biomedical Sciences (Chairman: Dr. Paul N. Yu), and the National Science Council (Chairman: Dr. Li An Chen) in sponsoring this Symposium, and the co-sponsorship by the Foundation for Biomedical Sciences (Chairman: Mr. S.K. Huang) and the China Committee for Scientific and Scholarly Cooperation with U.S.A. (Chairman: Mr. K.T. Li), as well as the generous support of several government agencies and private sector.

I wish to thank Drs. C. Y. Chai and Kung-ming Jan and other members of the Organizing Committee, the Local Executive Committee, and the Program Committee for their excellent work and to express my appreciation to the International and Local Honorary Advisors for their valuable advice and counsel. I am most grateful to Mr. Ching Tung Chen for his marvelous editorial assistance and I would like to thank Ms. Grace Han for her excellent cooperation during the preparation of this book.

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May 1988

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