
Cerebral Blood Flow

Effects of

Nerves and Neurotransmitters

Editors

Donald D. Heistad and Melvin L. Marcus

CEREBRAL BLOOD FLOW

Effect of Nerves and Neurotransmitters

Proceedings of a Symposium held June 16–18, 1981, at the Cardiovascular Center,
College of Medicine, the University of Iowa, Iowa City, Iowa, U.S.A.

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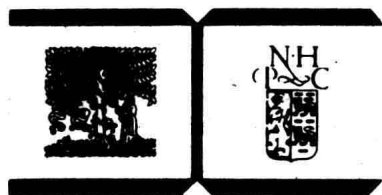
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ELSEVIER/NORTH-HOLLAND
NEW YORK • AMSTERDAM • OXFORD

Elsevier/North-Holland
New York-Amsterdam-Oxford

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Published by:
Elsevier North Holland, Inc.
52 Vanderbilt Avenue, New York, New York 10017

Sole distributors outside the USA and Canada:
Elsevier Science Publishers B.V.
P.O. Box 211, 1000AE
Amsterdam, The Netherlands

Library of Congress Cataloging in Publication Data

Main entry under title:

Cerebral blood flow.

(Developments in neuroscience; 14)

Includes index.

1. Brain—Blood-vessels—Innervation—Congresses. 2. Neurotransmitters—Physiological effect—Congresses. I. Heistad, Donald D. II. Marcus, Melvin L. III. Series. [DNLM: 1. Neuroregulators—Physiology—Congresses.
2. Cerebrovascular circulation—Congresses. 3. Cerebral arteries—Congresses.
4. Vasodilation—Congresses. WL 302 C41415 1981]

QP108.5.C4C464 612'.824 82-5099
ISBN 0-444-00689-3 AACR2

Manufactured in the United States of America

CEREBRAL BLOOD FLOW

Effect of Nerves and Neurotransmitters

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Preface

Donald D. Heistad and Melvin L. Marcus

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The first symposium that focused on neural regulation of cerebral blood flow was held in Stockholm in 1977. Drs. Christer Owman and Lars Edvinsson organized an exciting and rewarding meeting, and the proceedings of the symposium were published as a monograph (*Neurogenic Control of the Brain Circulation*, edited by C. Owman and L. Edvinsson, Oxford: Pergamon Press, Ltd., 1977).

This symposium was designed to reassemble many of the active investigators in this area of research. Our goal was a workshop at which controversial problems and contradictory results could be discussed at length, and at which cerebral vascular effects of nerves and neurotransmitters could be examined in depth. We hope that this volume will reflect the state of the art in this area of research, and that the book will be useful to both basic and clinical investigators with an interest in the topic.

The symposium focused on six topics which have received considerable attention in the past few years. The first session concerned itself with cellular mechanisms in cerebral vessels. Recent studies provided the first data concerning electrogenic mechanisms in cerebral vessels. Further evidence has been obtained concerning unique characteristics of cerebral vessels, including the role of extracellular and intracellular calcium in cerebral vasoconstriction. In the second session, new methods were described to examine cerebral vessels, and advantages and limitations of currently-used methods were reviewed. In the third session, effects of neurotransmitters on cerebral vessels were examined systematically. Direct effects of transmitters, and indirect effects mediated by changes in cerebral metabolism, have been demonstrated. The fourth session focused on the progress made towards understanding the role of

sympathetic nerves in the cerebral circulation. Recent evidence suggests that sympathetic nerves protect cerebral vessels during acute and chronic hypertension. The fifth session attempted to elucidate the role of neural vasodilator mechanisms. It is not clear whether acetylcholine, vasoactive intestinal peptide, or other transmitters play an important role in cerebral vessels. The physiological role of neural vasodilator mechanisms *in vivo* is also puzzling. Finally the sixth session addressed itself to the hypothesis that neural pathways arise in the brainstem, innervate cerebral vessels, and affect cerebral blood flow and capillary permeability. Most recent evidence does not support this provocative hypothesis, but the topic is timely and deserves careful examination.

We are grateful to the organizing committee, who helped in the planning of the symposium, the selection of the oral presentations and posters, and the chairing of each session. The committee members were Drs. John Bevan, Murray Harper, Hermes Kontos, Niels Lassen, Christer Owman, Michael Purves, Donald Reis, and Jacques Seylaz.

The recently restored Old Capitol of Iowa provided a lovely setting for the symposium. Dr. Donald Reis suggested that it seemed appropriate to write the Declaration of Independence in that setting. Because that task had been accomplished already, by a more nationalistic group, the participants focused on the more scientific tasks at hand. No questions were resolved, but that was expected. Questions are resolved in the laboratory, not at meetings. Recent progress was examined, however, and unanswered questions were brought into focus. It is our hope that the symposium, and this volume, will accelerate progress in this area of research.

Acknowledgments

We wish to express our deep gratitude to several people. William Radl worked hard and very effectively in arranging the symposium, and deserves our special thanks. Ann Kioschos and Susan Baloun carried out the secretarial duties with skill and dedication. Sandra Heistad made several major creative contributions in planning the meeting. We appreciate the encouragement and support of Dr. Francois Abboud. He initially stimulated us to study neural regulation of the cerebral circulation and created an atmosphere which permitted us to pursue the studies vigorously.

The symposium was sponsored by Grants from the National Institute of Neurological and Communicative Disorders (NS 16787) and the Council on Circulation of the American Heart Association, and by contributions from the Upjohn Company, American Cyanamid Company, Ayerst Laboratories, Ciba-Geigy Corporation, Hoffman-La Roche, Inc., Mead Johnson & Company, Merrell Research Center, Miles Laboratories, Sandoz, Inc., The Dow Chemical Company, Abbott Laboratories, Burroughs Wellcome Company, and McNeil Pharmaceuticals.

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