

Two Major New Series . . .

CONTEMPORARY TOPICS IN IMMUNOBIOLOGY

Volume 1

Edited by M. G. Hanna, Jr.

Biology Division

Oak Ridge National Laboratory

Oak Ridge, Tennessee

Contemporary Topics in Immunobiology provides a continuing source for immunologists focusing on an investigator's or group's collective research work in an area that has become one of the principal research vehicles in the study of cellular immunology, cancer, and transplantation.

Guided by an editorial board including noted authorities in the field such as M. G. Hanna, Jr. (General Editor), R. L. Carter, Max D. Cooper, A. J. S. Davies, Victor Nussenzweig, George W. Santos, Noel L. Warner, and William O. Weigle, this series offers research workers a summary of previously published work spanning several years.

This volume covers: the systems of lymphocytes in mouse and man: an interim appraisal; a developmental approach to the biological basis for antibody diversity; the mammalian "bursa-equivalent"; C-3 receptor sites on leukocytes; the surface immunoglobulins on lymphoid cells, the cellular basis of immunological unresponsiveness, and the application of marrow grafts in human disease: its problems and potentials.

188 pages

ISBN 0-306-37801-9

LC 68-26769

\$12.50

CONTEMPORARY TOPICS IN IMMUNOCHEMISTRY

Volume 1

Edited by F. P. Inman

Department of Microbiology

The University of Georgia

Athens, Georgia

This major new series offers critical assessments of the current state of knowledge in this fast-moving field. Guided by an editorial board including such leading authorities in the field as F. P. Inman (General Editor), G. L. Ada, H. N. Eisen, W. J. Mandy, R. R. Porter, and R. A. Reisfeld, this series reflects the rapid advances in immunochemistry.

Volume 1 focuses on a host of problems now under intensive research. Introducing new techniques and experimental methods for professionals and students alike, noted authorities discuss fundamental theories, test hypotheses, and thoroughly analyze specific immunological processes from a chemical perspective. The work examines such topics as antigen structure, immunogenicity of flagellin, macrophage RNA, membrane-bound immunoglobulins, antigen-binding sites, and the structure of IgD—all of vital interest in a field which promises to alter man's view of basic biomedical phenomena.

186 pages

ISBN 0-306-36101-9

LC 73-186260

\$14.50

Place your continuation order today for books in this series. It will ensure the delivery of new volumes **immediately** upon publication; you will be billed later. This arrangement is solely for your convenience and may be cancelled by you at any time. Kindly use the convenient order form attached.

PLENUM PUBLISHING CORPORATION

NEW YORK ■ 227 West 17th Street, New York 10011

LONDON ■ Davis House (4th Floor), 8 Scrubs Lane, Harlesden, NW10 6SE, England

0-306-39029-0

MICROENVIRONMENTAL ASPECTS OF IMMUNITY

Proceedings of the Fourth International Conference
on Lymphatic Tissue and Germinal Centers in Immune
Reactions held in Dubrovnik, Yugoslavia, June 26–30, 1972

Edited by
Branislav D. Janković
and
Katarina Isaković

Immunobiology Research Center
Institute of Immunobiology and Virology
and Microbiological Institute
University of Belgrade
Belgrade, Yugoslavia

 **PLENUM PRESS • NEW YORK–LONDON • 1973**

Library of Congress Catalog Card Number 72-89487
ISBN 0-306-39029-9

© 1973 Plenum Press, New York
A Division of Plenum Publishing Corporation
227 West 17th Street, New York, N. Y. 10011

United Kingdom edition published by Plenum Press, London
A Division of Plenum Publishing Company, Ltd.
Davis House (4th Floor), 8 Scrubs Lane, Harlesden, London,
NW10 6SE, England

All rights reserved

No part of this publication may be reproduced in any form without
written permission from the publisher

Printed in the United States of America

**MICROENVIRONMENTAL
ASPECTS OF IMMUNITY**

ADVANCES IN EXPERIMENTAL MEDICINE AND BIOLOGY

Editorial Board:

Nathan Back	<i>Chairman, Department of Biochemical Pharmacology, School of Pharmacy, State University of New York, Buffalo, New York</i>
N. R. Di Luzio	<i>Chairman, Department of Physiology, Tulane University School of Medicine, New Orleans, Louisiana</i>
Alfred Gellhorn	<i>University of Pennsylvania Medical School, Philadelphia, Pennsylvania</i>
Bernard Halpern	<i>Collège de France, Director of the Institute of Immuno-Biology, Paris, France</i>
Ephraim Katchalski	<i>Department of Biophysics, The Weizmann Institute of Science, Rehovoth, Israel</i>
David Kritchevsky	<i>Wistar Institute, Philadelphia, Pennsylvania</i>
Abel Lajtha	<i>New York State Research Institute for Neurochemistry and Drug Addiction, Ward's Island, New York</i>
Rodolfo Paoletti	<i>Institute of Pharmacology and Pharmacognosy, University of Milan, Milan, Italy</i>

Volume 1

THE RETICULOENDOTHELIAL SYSTEM AND ATHEROSCLEROSIS

Edited by N. R. Di Luzio and R. Paoletti • 1967

Volume 2

PHARMACOLOGY OF HORMONAL POLYPEPTIDES AND PROTEINS

Edited by N. Back, L. Martini, and R. Paoletti • 1968

Volume 3

GERM-FREE BIOLOGY: Experimental and Clinical Aspects

Edited by E. A. Mirand and N. Back • 1969

Volume 4

DRUGS AFFECTING LIPID METABOLISM

Edited by W. L. Holmes, L. A. Carlson, and R. Paoletti • 1969

Volume 5

LYMPHATIC TISSUE AND GERMINAL CENTERS IN IMMUNE RESPONSE

Edited by L. Fiore-Donati and M. G. Hanna, Jr. • 1969

Volume 6

RED CELL METABOLISM AND FUNCTION

Edited by George J. Brewer • 1970

Volume 7

SURFACE CHEMISTRY OF BIOLOGICAL SYSTEMS

Edited by Martin Blank • 1970

Volume 8

BRADYKININ AND RELATED KININS: Cardiovascular, Biochemical, and Neural Actions

Edited by F. Sicuteri, M. Rocha e Silva, and N. Back • 1970

Volume 9

SHOCK: Biochemical, Pharmacological, and Clinical Aspects

Edited by A. Bertelli and N. Back • 1970

Volume 10

THE HUMAN TESTIS

Edited by E. Rosemberg and C. A. Paulsen • 1970

Volume 11

MUSCLE METABOLISM DURING EXERCISE

Edited by B. Pernow and B. Saltin • 1971

Volume 12

MORPHOLOGICAL AND FUNCTIONAL ASPECTS OF IMMUNITY

Edited by K. Lindahl-Kiessling, G. Alm, and M. G. Hanna, Jr. • 1971

-
- Volume 13
CHEMISTRY AND BRAIN DEVELOPMENT
Edited by R. Paoletti and A. N. Davison • 1971
- Volume 14
MEMBRANE-BOUND ENZYMES
Edited by G. Porcellati and F. di Jeso • 1971
- Volume 15
THE RETICULOENDOTHELIAL SYSTEM AND IMMUNE PHENOMENA
Edited by N. R. Di Luzio and K. Flemming • 1971
- Volume 16A
THE ARTERY AND THE PROCESS OF ARTERIOSCLEROSIS: Pathogenesis
Edited by Stewart Wolf • 1971
- Volume 16B
THE ARTERY AND THE PROCESS OF ARTERIOSCLEROSIS: Measurement and Modification
Edited by Stewart Wolf • 1972
- Volume 17
CONTROL OF RENIN SECRETION
Edited by Tatiana A. Assaykeen • 1972
- Volume 18
THE DYNAMICS OF MERISTEM CELL POPULATIONS
Edited by Morton W. Miller and Charles C. Kuehnert • 1972
- Volume 19
SPHINGOLIPIDS, SPHINGOLIPIDOSES AND ALLIED DISORDERS
Edited by Bruno W. Volk and Stanley M. Aronson • 1972
- Volume 20
DRUG ABUSE: Nonmedical Use of Dependence-Producing Drugs
Edited by Simon Btesh • 1972
- Volume 21
VASOACTIVE POLYPEPTIDES
Edited by N. Back and F. Sicuteri • 1972
- Volume 22
COMPARATIVE PATHOPHYSIOLOGY OF CIRCULATORY DISTURBANCES
Edited by Colin M. Bloor • 1972
- Volume 23
THE FUNDAMENTAL MECHANISMS OF SHOCK
Edited by Lerner B. Hinshaw and Barbara G. Cox • 1972

-
- Volume 24
THE VISUAL SYSTEM: Neurophysiology, Biophysics, and Their Clinical Applications
Edited by G. B. Arden • 1972
- Volume 25
**GLYCOLIPIDS, GLYCOPROTEINS, AND MUCOPOLYSACCHARIDES
OF THE NERVOUS SYSTEM**
Edited by Vittorio Zambotti, Guido Tettamanti, and Mariagrazia Arrigoni • 1972
- Volume 26
PHARMACOLOGICAL CONTROL OF LIPID METABOLISM
Edited by William L. Holmes, Rodolfo Paoletti,
and David Kritchevsky • 1972
- Volume 27
DRUGS AND FETAL DEVELOPMENT
Edited by M. A. Klingberg, A. Abramovici, and J. Chemke • 1972
- Volume 28
HEMOGLOBIN AND RED CELL STRUCTURE AND FUNCTION
Edited by George J. Brewer • 1972
- Volume 29
MICROENVIRONMENTAL ASPECTS OF IMMUNITY
Edited by Branislav D. Janković and Katarina Isaković • 1973
- Volume 30
HUMAN DEVELOPMENT AND THE THYROID GLAND: Relation to Endemic Cretinism
Edited by J. B. Stanbury and R. L. Kroc • 1972
- Volume 31
IMMUNITY IN VIRAL AND RICKETTSIAL DISEASES
Edited by A. Kohn and M. A. Klingberg • 1972
- Volume 32
FUNCTIONAL AND STRUCTURAL PROTEINS OF THE NERVOUS SYSTEM
Edited by A. N. Davison, P. Mandel, and I. G. Morgan • 1972
- Volume 33
NEUROHUMORAL AND METABOLIC ASPECTS OF INJURY
Edited by A. G. B. Kovách, H. B. Stoner, and J. J. Spitzer • 1973
- Volume 34
PLATELET FUNCTION AND THROMBOSIS: A Review of Methods
Edited by P. M. Mannucci and S. Gorini • 1972

PREFACE

Investigation of the morphology and function of lymphatic tissue evolved rapidly during the past few years. Many new aspects and dimensions have proved to be of great significance for the understanding of processes which are triggered by immunological means. The cellular coordination that operates in immune response emphasizes again the importance of immuno-ecologic relations in the lymphatic tissue. It has become obvious that both the morphologic and the molecular properties of lymphatic cells are essential for their functional expression. Furthermore, the emerging body of evidence clearly shows that nonlymphatic cells (e.g. reticular cells and neurons) and substances that exert neurohumoral and hormonal activities should be regarded as normal constituents of the microenvironment of lymphatic tissue. The immune phenomena are, therefore, direct derivatives of processes that occur in this microenvironment. Such a view of the microenvironment of immunity calls for immunoendocrinologic, immunoneurologic and immunopharmacologic projects, it stimulates the creative imagination, and encourages research workers to enter into unexplored areas of the immunosciences. This book illustrates the joint efforts made by scientists from various parts of the world and armed with different ideas and views, to solve some of the mysteries of lymphatic tissue microenvironment.

The Fourth Conference took place in the lovely setting of Dubrovnik and in the shade of olive trees under which philosophers used to meditate in ancient times. For five days, from June 26 to 30, 1972, more than 250 scientists participated in the morning and afternoon plenary sessions. Specific attention was devoted to eight fundamental areas of immunobiology. The papers of many immunologists were supplemented by two special afternoon lectures given by Drs. D. C. Dumonde and J. B. Solomon.

The chairmen had a difficult and responsible task in selecting the most interesting from among the large number of excellent papers submitted. They organized and ensured the successful functioning of sessions, and reported the session highlights to all participants. Tribute should be paid to the patience and tolerance they showed towards the impatient organizers of the Conference.

We thank the staff and Fellows of the Immunology Research Center in Belgrade, particularly Dr. Spomenka Petrović, Dr. V. R. Paunović and Dr. B. M. Marković, for their invaluable help in the organization of the Conference and preparation of this volume. We should also like to thank Mrs. Madge Tomasević who has acted as language supervisor. The editors are also grateful to Mrs. Lela Jovanović for her secretarial work.

Our thanks are also due to the Yugoslav Federal Commission for Scientific Meetings, and the Institute for Immunobiology and Virology, Torlak, Belgrade, for their generous financial support, which made it possible for the Yugoslav Immunological Society to organize the Fourth Conference. The publication of this book is partially subsidized by the Association of Medical Research Institutions of Serbia, Belgrade.

July, 1972
Belgrade

Branislav D. Janković

Katarina Isaković

LIST OF CHAIRMEN, SPEAKERS AND CO-AUTHORS

- AIUTI, F., Department of Infectious Diseases, University
Rome, Italy.
- ALBINI, B., Institute for General and Experimental Patho-
logy, University of Vienna, Vienna, Austria.
- ALM, G.V., Department of Histology, University of Uppsala,
Uppsala, Sweden.
- AMBROSE, K.R., Oak Ridge National Laboratory, Oak Ridge,
Tenn., U.S.A.
- AMKRAUT, A.A., Department of Microbiology, Stanford Uni-
versity School of Medicine, Stanford, Calif. U.S.A.
- ANDERSON, J.C., Agricultural Research Council, Institute
for Research on Animal Diseases, Compton, Newbury,
Berkshire, England.
- ANDERSON, N.G., Oak Ridge National Laboratory, Oak Ridge,
Tenn., U.S.A.
- ARNAUD, D., Department of Cellular Immunology, Institute
Pasteur, Paris, France.
- ASTALDI, G., The Blood Research Foundation Center, Tortona,
Italy.
- ATKINS, R.C., MRC Cellular Immunology Unit, Sir William
Dunn School of Pathology, Oxford, England.
- BALFOUR, B., National Institute of Medical Research, Mill
Hill, London, England.
- BARNES, R.D., Clinical Research Center, Harrow, Middlesex,
England.
- BARNET, K., USOL Institute of Sera and Vaccines, Prague,
Czechoslovakia.
- BARONI, C.D., Institute of Pathological Anatomy II, Uni-
versity of Rome, Rome, Italy.

- BASTEN, A., Department of Bacteriology, University of Sydney, Sydney, Australia.
- BERTSCHMANN, M., Theodor Kocher Institut, Bern, Switzerland.
- BINNS, R.M., Agricultural Research Council, Institute of Animal Physiology, Babraham, Cambridge, England.
- BIRIEN, J.L., Institut d'Immunobiologie, Hôpital Broussais, Paris, France.
- BLAESE, R.M., National Cancer Institute, National Institutes of Health, Bethesda, Md., U.S.A.
- BLEUX, C., Institut d'Immunobiologie, Hôpital Broussais, Paris, France.
- BLOOM, B.R., Albert Einstein College of Medicine, Broux, N.Y., U.S.A.
- BOEHMER, H.v., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- BUNAREVIĆ, A., Department of Animal Physiology, Faculty of Natural Sciences and Mathematics, Zagreb, Yugoslavia.
- BUSSARD, A., Department of Cellular Immunology, Institute Pasteur, Paris, France.
- BYRD, W.J., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- ČECH, K., Institute of Sera and Vaccines, Prague, Czechoslovakia.
- CEGLOWSKI, W., Department of Microbiology, Pennsylvania State University, Philadelphia, Pa., U.S.A.
- CHAN, P.L., Cancer Research Laboratory, University of Western Ontario, London, Ontario, Canada.
- CHANANA, A.D., Brookhaven National Laboratory, Upton, N.Y., U.S.A.
- CHEERS, C., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- CHRISTIE, G.H., Department of Protein Chemistry, Wellcome Research Laboratories, Langley Court, Beckenham, Kent, England.
- CLAMAN, H.N., University of Colorado Medical Center, Denver, Colo., U.S.A.
- CLARKE, J., Department of Bacteriology, University of California, Los Angeles, Calif., U.S.A.
- CLERICI, E., Cattedra di Immunologia, Università degli Studi, Milano, Italy.

- COGGIN, J.H., University of Tennessee, Knoxville, Tenn., U.S.A.
- COHEN, I.R., Department of Cell Biology, Weizmann Institute of Science, Rehovot, Israel.
- COOPER, M.D., Department of Pediatrics, University of Alabama in Birmingham, Birmingham, Ala., U.S.A.
- COOPER, W.C., Department of Pathology, University of Minnesota, Minneapolis, Minn., U.S.A.
- COTTIER, H., Institute of Pathology, University of Bern, Bern, Switzerland.
- COUDERC, J., Institut d'Immunobiologie, Hôpital Broussais, Paris, France.
- DAMHOF, J., Pediatrics and Pathology Research Laboratories, University of Minnesota, Minneapolis, Minn., U.S.A.
- DECKER, J., Department of Bacteriology, University of California, Los Angeles, Calif., U.S.A.
- DEKARIŠ, D., Rudjer Bošković Institute, Zagreb, Yugoslavia.
- DELUCA, D., Department of Bacteriology, University of California, Los Angeles, Calif., U.S.A.
- DENNERT, G., The Salk Institute for Biological Studies, San Diego, Calif., U.S.A.
- DEODHAR, S.D., Department of Immunology, Cleveland Clinic Foundation, Cleveland, Ohio, U.S.A.
- DE SOUSA, M.A.B., Department of Bacteriology and Immunology, University of Glasgow, Glasgow, Scotland.
- DICKE, K.A., Radiobiological Institute, Rijswijk, The Netherlands.
- DIENER, E., Department of Pathology, University of Alberta, Edmonton, Alberta, Canada.
- DIETRICH, F.M., Biological Research Laboratories of the Pharmaceuticals Division, CIBA-GEIGY LTD., Basel, Switzerland.
- DORIA, G., CHEN-Euratom Immunogenetics Group, Laboratory of Animal Radiobiology, C.S.N. Casaccia, Rome, Italy.
- DUC, H.T., Centre d'Immuno-Pathologie de l'Association Claude-Bernard, Paris, France.
- DUKOR, P., Biological Research Laboratories of the Pharmaceuticals Division, CIBA-GEIGY LTD., Basel, Switzerland.
- DUMONDE, D.C., Division of Immunology, Kennedy Institute of Rheumatology, London, England.

- DURKIN, H.G., Department of Pathology, New York University School of Medicine, New York, N.Y., U.S.A.
- DVORAK, A.M., Tufts University Medical School, Boston, Mass., U.S.A.
- DVORAK, H.F., Department of Pathology, Massachusetts General Hospital, Boston, Mass., U.S.A.
- ENOMOTO, K., Department of Surgery, Stanford University, Stanford, Calif., U.S.A.
- FAHEY, K.J., Department of Immunology, Commonwealth Serum Laboratories, Parkville, Australia.
- FELDMANN, M., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- FERFOGLIA, L., The Blood Research Foundation Center, Tortona, Italy.
- FERGUSON, A., Department of Bacteriology and Immunology, University of Glasgow, Glasgow, Scotland.
- FERNANDES, G., Department of Laboratory Medicine, University of Minnesota, Minneapolis, Minn., U.S.A.
- FORD, W.L., MRC Cellular Immunology Unit, Sir William Dunn School of Pathology, Oxford, England.
- FRANK, M., National Institute of Allergy and Infectious Diseases, NIH, Bethesda, Md., U.S.A.
- FRIEDMAN, H., Department of Microbiology, Albert Einstein Medical Center, Philadelphia, Pa., U.S.A.
- GALLILY, R., Department of Immunology, The Hebrew University-Hadassah Medical School, Jerusalem, Israel.
- GAROTTA, G., Cattedra di Immunologia, Università degli Studi, Milano, Italy.
- GATTI, R.A., Department of Tumor Biology, Karolinska Institute, Stockholm, Sweden.
- GELFAND, E.W., Max-Planck-Institute for Immunobiology, Freiburg, W. Germany.
- GERSHANIK, J.J., Department of Tumor Biology, Karolinska Institute, Stockholm, Sweden.
- GLOBERSON, A., Department of Cell Biology, Weizmann Institute of Science, Rehovot, Israel.
- GOLOUH, R., The Blood Research Foundation Center, Tortona, Italy.
- GOOD, R.A., Departments of Pathology and Pediatrics, University of Minnesota, Minneapolis, Minn., U.S.A.

- GOWLAND, G., Department of Immunology, The General Infirmary, University of Leeds, Leeds, England.
- GREEN, I., National Institute of Allergy and Infectious Diseases, NIH, Bethesda, Md., U.S.A.
- GRUBER, R., Department of Surgery, Stanford University, Stanford, Calif., U.S.A.
- HAJDU, I., Institute of Microbiology, Czechoslovak Academy of Sciences, Prague, Czechoslovakia.
- HANNA, M.G., Jr., Biology Division, Oak Ridge National Laboratory, Oak Ridge, Tenn., U.S.A.
- HARNESS, E., Department of Microbiology, Tel Aviv University, Tel Aviv, Israel.
- HARRIS, G., Department of Immunology, St. Mary's Hospital Medical School, London, England.
- HERBERMAN, R., National Institute of Allergy and Infectious Diseases, NIH, Bethesda, Md., U.S.A.
- HESS, M.W., Institute of Pathology, University of Bern, Bern, Switzerland.
- HOLUB, M., Department of Immunology, Institute of Microbiology, Czechoslovak Academy of Sciences, Prague, Czechoslovakia.
- HOWARD, J.G., Department of Experimental Immunobiology, Wellcome Research Laboratories, Langley Court, Beckenham, Kent, England.
- HUMPHREY, J.H., National Institute for Medical Research, Mill Hill, London, England.
- ISAKOVIĆ, K., Immunology Research Center, Belgrade, Yugoslavia.
- IVANUŠ, J., Department of Biochemistry, University of Belgrade, Belgrade, Yugoslavia.
- JACOBS, R.J., National Cancer Institute, National Institutes of Health, Bethesda, Md., U.S.A.
- JANKOVIĆ, B.D., Immunology Research Center, Belgrade, Yugoslavia.
- JAROŠKOVA, L., Department of Immunology, Institute of Microbiology, Czechoslovak Academy of Sciences, Prague, Czechoslovakia.
- JOEL, D.D., Medical Research Center, Brookhaven National Laboratory, Upton, N.Y., U.S.A.
- JOHANOVSKY, J., USOL Institute of Sera and Vaccines, Prague, Czechoslovakia.

- JOSE, D.G., Department of Pathology, University of Minnesota, Minneapolis, Minn., U.S.A.
- KASPER, P., Department of Microbiology, Stanford University, Stanford, Calif., U.S.A.
- KASŤELAN, A., Department of Animal Physiology, Faculty of Natural Sciences and Mathematics, University of Zagreb, Zagreb, Yugoslavia.
- KEDAR, E., Department of Immunology, The Hebrew University, Hadassah Medical School, Jerusalem, Israel.
- KELLY, R.H., Division of Immunology, Kennedy Institute of Rheumatology, London, England.
- KINSKY, R.G., Centre d'Immuno-Pathologie de l'Association Claude-Bernard, Paris, France.
- KIRCHNER, H., National Institute of Dental Research, National Institutes of Health, Bethesda, Md., U.S.A.
- KIRKPATRICK, C.H., Laboratory of Clinical Investigation, National Institutes of Health, Bethesda, Md., U.S.A.
- KOOL, G.A., Department of Histology, Free University, Amsterdam, The Netherlands.
- KORZASH, Z., Department of Experimental Medicine and Cancer Research, Hebrew University-Hadassah Medical School, Jerusalem, Israel.
- KREJČI, J., Institute of Sera and Vaccines, Prague, Czechoslovakia.
- LABADIE, G.U., Albert Einstein Medical Center, Philadelphia, Pa., U.S.A.
- LAWTON, A.R. III, Department of Microbiology, University of Alabama in Birmingham, Birmingham, Ala., U.S.A.
- LENNOX, E.S., The Salk Institute for Biological Studies, San Diego, Calif., U.S.A.
- LEVKOFF, A.H., Department of Pathology, University of Minnesota, Minneapolis, Minn., U.S.A.
- LIACOPOULOS, P., Institut d'Immunobiologie, Hôpital Broussais, Paris, France.
- LINNA, T.J., Department of Histology, Institute of Human Anatomy, University of Uppsala, Uppsala, Sweden.
- LOWY, I., Department of Cellular Immunology, Institute Pasteur, Paris, France.
- LUCAS, Z.J., Department of Surgery, Stanford University, Stanford, Calif., U.S.A.

- LUCKEY, T.D., Albert Einstein Medical Center, Philadelphia, Pa., U.S.A.
- LUKIĆ, M.L., Immunology Research Center, Belgrade, Yugoslavia.
- LUSCHER, E.F., Theodor Kocher Institut, Bern, Switzerland.
- MAILLARD, J.L., Centre d'Immuno-Pathologie de l'Association Claude-Bernard, Paris, France.
- MAINI, R.N., Division of Immunology, Kennedy Institute of Rheumatology, London, England.
- MARIANI, T., Pediatrics and Pathology Research Laboratories, University of Minnesota, Minneapolis, Minn., U.S.A.
- MAZIE, J.C., Department of Cellular Immunology, Institute Pasteur, Paris, France.
- MARTHUR, W.P., Department of Pathology, New York University School of Medicine, New York, N.Y., U.S.A.
- MCFARLIN, D.E., National Institute of Medical Research, Mill Hill, London, England.
- MCPHERSON, L., Department of Bacteriology, University of California, Los Angeles, Calif., U.S.A.
- MEROLLA, R., The Blood Research Foundation Center, Tortona, Italy.
- MICU, D., Institute of Internal Medicine, Bucharest, Romania.
- MILLER, A., Department of Bacteriology, University of California, Los Angeles, Calif., U.S.A.
- MIRANDA, J.J., Department of Experimental Immunobiology, Wellcome Research Laboratories, Langley Court, Beckenham, Kent, England.
- MITCHELL, G.F., National Institute for Medical Research, Mill Hill, London, England.
- MITCHELL, J., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- MOCARELLI, P., Cattedra di Immunologia, Università degli Studi, Milano, Italy.
- MORECKI, S., Department of Immunology, The Hebrew University-Hadassah Medical School, Jerusalem, Israel.
- MOTICKA, E.J., Department of Immunology, Institute of Microbiology, Czechoslovak Academy of Sciences, Prague, Czechoslovakia.
- NAKAMURA, I., Department of Cell Biology, Weizmann Institute of Science, Rehovot, Israel.

- NAOR, D., Department of Immunology, The Hebrew University-Hadassah Medical School, Jerusalem, Israel.
- NIEUWENHUIS, P., Department of Histology, State University of Groningen, Groningen, The Netherlands.
- NOSSAL, G.J.V., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- OATES, C.M., Division of Immunology, Kennedy Institute of Rheumatology, London, England.
- OPPENHEIM, J.J., National Institute of Dental Research, National Institutes of Health, Bethesda, Md., U.S.A.
- O'TOOLE, C.M., Wenner Gren Institute, Stockholm, Sweden.
- OZER, H., Department of Microbiology, Yale University School of Medicine, New Haven, Conn., U.S.A.
- PANIJEL, J., Institut d'Immunobiologie, Hôpital Broussais, Paris, France.
- PARROTT, D.M.V., Department of Bacteriology and Immunology, University of Glasgow, Glasgow, Scotland.
- PAUL, W.E., National Institute of Allergy and Infectious Diseases, National Institute of Health, Bethesda, Md., U.S.A.
- PAYNE, L.N., Division of Immunology, Kennedy Institute of Rheumatology, London, England.
- PEKAREK, J., USOL Institute of Sera and Vaccines, Prague, Czechoslovakia.
- PELC, S.R., Division of Cellular Biology, Kennedy Institute of Rheumatology, London, England.
- PIERPAOLI, W., Schweizerisches Forschungsinstitut, Medizinische Abteilung, Davos-Platz, Switzerland.
- PIKE, B.L., The Walter and Eliza Hall Institute of Medical Research, Melbourne, Australia.
- PIKOVSKI, M.A., Department of Experimental Medicine and Cancer Research, The Hebrew University-Hadassah Medical School, Jerusalem, Israel.
- PLAYFAIR, J.H.L., Department of Immunology, The Middlesex Hospital Medical School, London, England.
- PLESNIČAR, S., Institute of Oncology, University of Ljubljana, Ljubljana, Yugoslavia.
- PORTA, C., Cattedra di Immunologia, Università degli Studi, Milano, Italy.