Macrophage Biology

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Editors

Sherwood Reichard
Departments of Radiology and Physiology
Medical College of Georgia
Augusta, Georgia

Mizu Kojima
Department of Pathology
Institute of Basic Medical Sciences
The University of Tsukuba
Niihari-Gun, Ibaraki, Japan

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Contributors

Dolph O. Adams, Departments of Pathology and Microbiology-Immunology, Duke University Medical Center, Durham, NC [3,427]

Tadaatsu Akagi, Department of Pathology, Kochi Medical School, Kochi, Japan [735]

Ken-ichi Akamatsu, Department of Pathology, Tokai University School of Medicine, Kanagawa, Japan [391]

Yuzuru Akamatsu, Department of Chemistry, National Institute of Health, Tokyo, Japan [447]

Enrica Alteri, National Cancer Institute, Frederick Cancer Research Facility, Frederick, MD [259]

Carl R. Alving, Walter Reed Army Medical Center, Washington, DC [43]

Fumio Amano, Department of Chemistry, National Institute of Health, Tokyo, Japan [447]

K. Amanuma, Department of Microbiology and Molecular Pathology, Faculty of Pharmaceutical Sciences, Teikyo University, Kanagawa, Japan [323]

Richard G.W. Anderson, Department of Cell Biology, University of Texas Southwestern Medical School, Dallas, TX [417]

Shmuel Argov, Department of Microbiology and Immunology, Duke University Medical Center, Durham, NC [695]

Anne Arthur, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD [745]

Keizo Asami, Department of Parasitology, Keio University School of Medicine, Tokyo, Japan [659]

O. Axelrod, Department of Chemical Immunology, The Weizmann Institute of Science, Rehovot, Israel [155]

Ichiro Azuma, Department of Chemistry, Institute of Immunological Science, Hokkaido University, Sapporo, Japan [597]

Dorothy F. Bainton, Laboratory of Radiobiology and Environmental Health, University of California, San Francisco, CA [339]

Mariano Barbacid, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD [745]

Susanne Becker, Department of Obstetrics and Gynecology, Lineberger Cancer Research Center, University of North Carolina, Chapel Hill, NC [455]

David L. Becton, Department of Pediatrics, Duke University Medical Center, Durham, NC [3]

Barry R. Bloom, Department of Microbiology/Immunology, Albert Einstein College of Medicine, Bronx, NY [665]

Glenn H. Bock, Department of Nephrology, Children's Hospital National Medical Center, George Washington University, Washington, DC [901]

Gary A. Boorman, Chemical Pathology Branch TRTP, National Institute of Environmental Health Sciences, Research Triangle Park, NC [563]

The number in brackets is the opening page number of the contributor's article.

Stephen K. Chapes, Kansas State University Division of Biology, Manhattan, KS **[69]**

Ben D-M. Chen, Department of Experimental Therapeutics, Michigan Cancer Foundation, Detroit, MI **[673]**

Dennis E. Chenoweth, Department of Pathology, VA Medical Center and University of California-San Diego, San Diego, CA **[439]**

Robert W. Chesnut, Department of Medicine, National Jewish Hospital and Research Center, Denver, CO; present address: Department of Pathology, University of Colorado Health Sciences Center, Denver, CO **[125]**

Jennie R. Chin, Laboratory of Radiobiology and Environmental Health, University of California, San Francisco, CA **[339]**

Donald A. Cohen, Department of Medical Microbiology and Immunology, University of Kentucky, Lexington, KY **[177]**

Frank M. Collins, Trudeau Institute, Inc., Saranac Lake, NY **[397]**

W. Th. Daems, Laboratory for Electron Microscopy, University of Leiden, Leiden, The Netherlands **[621]**

Andrea J. Daulerio, Glenolden Laboratory, E.I. duPont de Nemours and Company, Glenolden, PA **[363]**

Jack H. Dean, Department of Cell Biology, Chemical Industry Institute of Toxicology, Research Triangle Park, NC **[583]**

Betty Diamond, Department of Microbiology, Immunology and Medicine, Albert Einstein College of Medicine, Bronx, NY **[665]**

Guifeng Ding, Department of Microbiology/Immunology, Albert Einstein College of Medicine, Bronx, NY **[665]**

John Ding-E. Young, Department of Cellular Physiology and Immunology, Rockefeller University, New York, NY **[407]**

Isaiah J. Fidler, Department of Cell Biology, University of Texas, M.D. Anderson Hospital and Tumor Institute, Houston, TX **[81]**

Nozomu Fujimoto, Department of Pathology, Sapporo Medical College, Sapporo, Japan **[783]**

Tatsuji Fujiwara, Laboratory for Electron Microscopy, Keio University School of Medicine, Tokyo, Japan **[659]**

Tokunin Fukushima, Department of Pathology, Chiba Cancer Center Research Institute, Chiba, Japan **[821]**

Ruth Gallily, Lautenberg Center for General and Tumor Immunology, Hebrew University-Hadassah Medical School, Jerusalem, Israel **[155,715]**

Micheal J. Gilbreath, Walter Reed Army Medical Center, Washington, DC **[43]**

L.A. Ginsel, Laboratory for Electron Microscopy, University of Leiden, Leiden, The Netherlands **[621]**

Hana Golding, Immunology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD **[193]**

Fumimasa Goto, Department of Immunopathology, Kumamoto University Medical School, Kumamoto, Japan **[375]**

Mitsuaki Goto, Department of Industrial Chemistry, Faculty of Engineering, Nagasaki University, Nagasaki, Japan **[613]**

Howard M. Grey, Department of Medicine, National Jewish Hospital and Research Center, Denver, CO; present address: Department of Pathology, University of Colorado Health Sciences Center, Denver, CO **[125]**

Veronika Groh, Department of Dermatology I, University of Vienna, Vienna, Austria **[723]**

Lindsay A. Guthrie, Department of Pediatrics, National Jewish Hospital and Research Center, Denver, CO **[535]**

Sonoko Habu, Department of Cell Biology, Tokai University School of Medicine, Kanagawa, Japan **[391]**

Thomas A. Hamilton, Department of Pathology, Duke University Medical Center, Durham, NC **[3,427]**

Masao Hanaoka, Department of Pathology, Kyoto University Institute for Virus Research, Kyoto, Japan **[767]**

Kohei Hara, 2nd Department of Internal Medicine, School of Medicine, Nagasaki University, Nagasaki, Japan **[613]**

Stephen Haskill, University of; North Carolina, Lineberger Cancer Research Center, Chapel Hill, NC **[69]**

Hideo Hayashi, Department of Pathology, Kumamoto University Medical School, Kumamoto, Japan **[231]**

Peter M. Henson, Department of Pediatrics, National Jewish Hospital and Research Center, Denver, CO **[535]**

Kelly P. Hepper, Department of Pharmacology and Experimental Therapeutics, University of Maryland, Baltimore, MD **[397]**

Masaki Hirota, 2nd Department of Internal Medicine, School of Medicine, Nagasaki University, Nagasaki, Japan **[613]**

Mitsuo Honda, Department of Pathology, Kumamoto University Medical School, Kumamoto, Japan **[231]**

Lily H. Hong, National Institute of Environmental Health Sciences, Research Triangle Park, NC **[563]**

David L. Hoover, Walter Reed Army Medical Center, Washington, DC **[43]**

Shuntaro Hosaka, Basic Research Laboratories, Toray Industries Inc., Kamakura, Japan **[545]**

Masahiko Hoshijima, Department of Biochemistry, Kobe University School of Medicine, Kobe, Japan **[221]**

Robert V. House, Department of Cell Biology, Chemical Industry Institute of Toxicology, Research Triangle Park, NC **[583]**

Elizabeth Husztik, Institute of Medical Biology, University Medical School, Szeged, Hungary **[571]**

Yutaka Imai, Department of Pathology, Yamagata University School of Medicine, Yamagata, Japan **[865]**

T. Imanaka, Department of Microbiology and Molecular Pathology, Faculty of Pharmaceutical Sciences, Teikyo University, Kanagawa, Japan **[323]**

Y. Inoue, Kolling Institute of Medical Research, Royal North Shore Hospital of Sydney, St Leonards, NSW, Australia **[833]**

Kiyoshi Ishii, 3rd Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[355]**

Yoshifumi Ishii, Department of Pathology, Sapporo Medical College, Sapporo, Japan **[783]**

Masakazu Ishikawa, Department of Pathology, Yamagata University School of Medicine, Yamagata, Japan **[865]**

Fred C. Jensen, Cytotech, San Diego, CA **[821]**

Paul A. Johnston, Department of Pathology, Duke University Medical Center, Durham, NC **[427]**

Richard B. Johnston, Jr., Department of Pediatrics, National Jewish Hospital and Research Center, Denver, CO; present address: Departments of Pediatrics, Biochemistry and Pathology, University of Colorado School of Medicine, Denver, CO **[535]**

Teizo Kabashima, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Kozo Kaibuchi, Department of Biochemistry, Kobe University School of Medicine, Kobe, Japan **[221]**

Takeshi Kambara, Department of Allergy, Institute for Medical Immunology, Kumamoto University Medical School, Kumamoto, Japan **[271]**

T. Kanaseki, Department of Genetics, Tokyo Metropolitan Institute for Neurosciences, Tokyo, Japan **[323]**

Alan M. Kaplan, Department of Medical Microbiology and Immunology, University of Kentucky, Lexington, KY **[177]**

Sudesh Kapur, Department of Pathology, Childrens Hospital National Medical Center, George Washington University, Washington, DC **[901]**

Shinpei Kasakura, Department of Medicine and Laboratory Medicine, Faculty of Medicine, Kyoto University, Kyoto, Japan **[505]**

Heihachiro Kashiwagi, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Tetsu Kawaguchi, Department of Allergy, Institute for Medical Immunology, Kumamoto University Medical School, Kumamoto, Japan **[271]**

Yutaka Kawakami, Department of Internal Medicine, Keio University School of Medicine, Tokyo, Japan **[659]**

Kiyoko Kawamura, Department of Pathology, Chiba Cancer Center Research Institute, Chiba, Japan **[821]**

Kokichi Kikuchi, Department of Pathology, Sapporo Medical College, Sapporo, Japan **[783]**

Takayuki Kitagawa, Department of Chemistry, National Institute of Health, Tokyo, Japan **[447]**

Seymour J. Klebanoff, Department of Medicine, University of Washington, Seattle, WA **[487]**

Eugenie S. Kleinerman, Department of Cell Biology, University of Texas, M.D. Anderson Hospital and Tumor Institute, Houston, TX **[81]**

Mizu Kojima, Department of Pathology, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[827,881]**

Kazuo Komiyama, Department of Microbiology, University of Alabama in Birmingham, Birmingham, AL **[905]**

Toshibumi Kondo, Uwajima City Hospital, Uwajima, Japan **[767]**

Ichiro Kono, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Hillel S. Koren, Department of Microbiology and Immunology, Duke University Medical Center, Durham, NC **[695]**

Hirofumi Koshiba, Department of Pathology, Sapporo Medical College, Sapporo, Japan **[783]**

Nobuko Koshikawa, Department of Pathology, Chiba Cancer Center Research Institute, Chiba, Japan **[821]**

Ichiro Kukita, Department of Allergy, Institute for Medical Immunology, Kumamoto University Medical School, Kumamoto, Japan **[271]**

Seishi Kyoizumi, Department of Pathology, Radiation Effect Research Foundation, Hiroshima, Japan **[473]**

Lloyd D. Lauer, Department of Cell Biology, Chemical Industry Institute of Toxicology, Research Triangle Park, NC **[583]**

George Lázár, Institute of Pathophysiology, University Medical School, Szeged, Hungary **[571]**

Edward J. Leonard, National Cancer Institute, Frederick Cancer Research Facility, Frederick, MD **[259]**

James Loewenstein, Lautenberg Center for General and Tumor Immunology, Hebrew University–Hadassah Medical School, Jerusalem, Israel **[715]**

Ruth Lomnitzer, Department of Immunology, South African Institute for Medical Research, Johannesburg, South Africa **[873]**

Linda K. Long, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD **[745]**

Michael I. Luster, Systemic Toxicology Branch TRTP, National Institute of Environmental Health Sciences, Research Triangle Park, NC **[563]**

Takeo Madarame, Department of Internal Medicine, Iwate Medical University School of Medicine, Morioka, Japan **[651]**

Kunihiko Maeda, Department of Pathology, Yamagata University School of Medicine, Yamagata, Japan **[865]**

Dionisio Martin-Zanca, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD **[745]**

Koshi Maruyama, Department of Pathology, Chiba Cancer Center Research Institute, Chiba, Japan **[821]**

Tohru Masuda, Department of Immunobiology, Institute for Immunology, Faculty of Medicine, Kyoto University, Kyoto, Japan **[473]**

Tomoyuki Masuda, Department of Pathology, Iwate Medical University School of Medicine, Morioka, Japan **[651]**

Mikio Matsuda, Department of Pathology, Yamagata University School of Medicine, Yamagata, Japan **[865]**

Linda C. McPhail, Department of Pediatrics, National Jewish Hospital and Research Center, Denver, CO **[535]**

Monte S. Meltzer, Walter Reed Army Institute of Research and Dermatology Service, Walter Reed Army Medical Center, Washington, DC **[43]**

Jiri Mestecky, Department of Microbiology, University of Alabama in Birmingham, Birmingham, AL **[905]**

Shigeki Minakami, Department of Biochemistry, Kyushu University School of Medicine, Fukuoka, Japan **[513]**

Keisuke Minato, Departments of Clinical Laboratory and Internal Medicine, National Cancer Center Hospital, Tokyo, Japan **[803]**

Motohiro Miyauchi, Department of Pathology, Chiba Cancer Center Research Institute, Chiba, Japan **[821]**

Shigenobu Mochizuki, Department of Pathology, Chiba Cancer Center Research Institute, Chiba, Japan **[821]**

Zina Moldoveanu, Department of Microbiology, University of Alabama in Birmingham, Birmingham, AL **[905]**

Nobuhiro Monma, Department of Pathology, Iwate Medical University School of Medicine, Morioka, Japan **[651]**

Naoyoshi Mori, Department of Pathology, University of Tsukuba, Ibaraki, Japan **[827]**

Itaru Moro, Department of Microbiology, University of Alabama in Birmingham, Birmingham, AL **[905]**

E. Mozes, Department of Chemical Immunology, The Weizmann Institute of Science, Rehovot, Israel **[155]**

Michael J. Murray, Department of Cell Biology, Chemical Industry Institute of Toxicology, Research Triangle Park, NC **[583]**

Seiji Mutsuura, 3rd Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[355]**

Carol A. Nacy, Walter Reed Army Medical Center, Washington, DC **[43]**

Masami Nagai, Departments of Clinical Laboratory and Internal Medicine, National Cancer Center Hospital, Tokyo, Japan **[803]**

Yumiko Nagata-Takeuchi, 2nd Department of Internal Medicine, Faculty of Medicine, University of Tokyo, Tokyo, Japan **[665]**

Makoto Naito, 2nd Department of Pathology, Kumamoto University Medical School, Kumamoto, Japan **[887]**

Miwako Nakagawara, Department of Anesthesiology, Kyushu University School of Medicine, Fukuoka, Japan **[513]**

Masao Nakano, Department of Radiology, Ryukyu University School of Medicine, Okinawa, Japan **[821]**

Masayasu Nakano, Department of Microbiology, Jichi Medical School, Tochigi, Japan **[163]**

Yujiro Namba, Department of Pathology, Kyoto University Institute for Virus Research, Kyoto, Japan **[767]**

Reiko Namikawa, 1st Department of Pathology, Nagoya University School of Medicine, Nagoya, Japan **[791]**

D.S. Nelson, Kolling Institute of Medical Research, Royal North Shore Hospital of Sydney, St Leonards, NSW, Australia **[833]**

Margaret Nelson, Kolling Institute of Medical Research, Royal North Shore Hospital of Sydney, St Leonards, NSW, Australia **[833]**

Robert C. Newton, Glenolden Laboratory, E.I. duPont de Nemours and Company, Glenolden, PA **[363]**

Christian Nezelof, Pathology Hôpital Necker Enfants Malades, Paris, France **[847]**

S.J. Normann, Department of Pathology, University of Florida, Gainesville, FL **[285]**

Maja Nowakowski, Department of Pathology, SUNY Downstate Medical Center, Brooklyn, NY **[463]**

Tetsuhei Ogawa, Department of Internal Medicine, Keio University School of Medicine, Tokyo, Japan **[659]**

Mitsumasa Ogawara, 3rd Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[355]**

S. Ohkuma, Department of Microbiology and Molecular Pathology, Faculty of Pharmaceutical Sciences, Teikyo University, Kanagawa, Japan **[323]**

Yuji Ohtsuki, Department of Pathology, Kochi Medical School, Kochi, Japan **[735]**

Keiichi Oikawa, Department of Pathology, Iwate Medical University School of Medicine, Morioka, Japan **[651]**

Kuniyuki Oka, Clinical Affairs Section, National Institute of Radiological Sciences, Chiba, Japan **[827]**

Rosa Laura Oropeza, Laboratory of Radiobiology and Environmental Health, University of California, San Francisco, CA **[339]**

Kazuo Ota, Aichi Cancer Center, Nagoya, Japan **[791]**

Morio Otsuka, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Eietsu Ouchi, Department of Clinical and Laboratory Medicine, Tohoku University School of Medicine, Sendai, Japan **[523]**

Michael J. Pabst, Department of Pediatrics, National Jewish Hospital and Research Center, Denver, CO **[535]**

Renée Phillips, Department of Immunology, South African Institute for Medical Research, Johannesburg, South Africa **[873]**

Terry M. Phillips, Immunologic Chemistry Laboratory, George Washington University Medical Center, Washington, DC **[901]**

Sylvia B. Pollack, Department of Biological Structure, University of Washington School of Medicine, Seattle, WA **[707]**

Arthur R. Rabson, Department of Immunology, South African Institute for Medical Research, Johannesburg, South Africa **[873]**

Andy C. Reese, Department of Cell and Molecular Biology, Medical College of Georgia, Augusta, GA **[551]**

Sherwood M. Reichard, Departments of Radiology and Physiology, Medical College of Georgia, Augusta, GA **[551]**

Susan Ribárszki, Institute of Pathophysiology, University Medical School, Szeged, Hungary **[571]**

L.P. Rijfkogel, Laboratory for Electron Microscopy, University of Leiden, Leiden, The Netherlands **[621]**

Amy S. Rosenberg, Immunology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD **[193]**

Cornelius Rosse, Department of Biological Structure, University of Washington School of Medicine, Seattle, WA **[707]**

Edward J. Ruley, Department of Nephrology, Children's Hospital National Medical Center, George Washington University, Washington, DC **[901]**

Atsushi Saito, 2nd Department of Internal Medicine, School of Medicine, Nagasaki University, Nagasaki, Japan **[613]**

Tatsuo Saito-Taki, Department of Microbiology, Jichi Medical School, Tochigi, Japan **[163]**

Hideo Sakuma, Department of Pathology, University of Tsukuba, Ibaraki, Japan **[827]**

Tetsushi Sakurai, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Eugenio Santos, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD **[745]**

Masataka Sasada, Department of Medicine and Laboratory Medicine, Faculty of Medicine, Kyoto University, Kyoto, Japan **[505]**

Shunichi Sasou, Department of Pathology, Iwate Medical University School of Medicine, Morioka, Japan **[651]**

Shunichi Sato, Department of Pathology, Iwate Medical University School of Medicine, Morioka, Japan **[651]**

Takashi Sato, Department of Pathology, Yamagata University School of Medicine, Yamagata, Japan **[865]**

Yuichi Sato, Head-Pathology Division, National Cancer Center Research Institute, Tokyo, Japan **[855]**

Ryoichi Satodate, Department of Pathology, Iwate Medical University, School of Medicine, Morioka, Japan **[651]**

Makoto Sawamura, Department of Biochemistry, Kobe University School of Medicine, Kobe, Japan **[221]**

Robert D. Schreiber, Department of Immunology, Research Institute of Scripps Clinic, La Jolla, CA **[15]**

Shigeki Seki, Departments of Clinical Laboratory and Internal Medicine, National Cancer Center Hospital, Tokyo, Japan **[803]**

Kazuo Shimamura, Department of Pathology, Tokai University School of Medicine, Kanagawa Japan **[391]**

Masanori Shimoyama, Departments of ClinicakLaboratory and Internal Medicine, National Cancer Center Hospital, Tokyo, Japan **[803]**

Alfred Singer, Immunology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD **[193]**

Alison Skeel, National Cancer Institute, Frederick Cancer Research Facility, Frederick, MD **[259]**

Marshall D. Sklar, Department of Radiation Oncology, St. Jude Children's Research Hospital, Memphis, TN **[673]**

W. Sluiter, Department of Infectious Diseases, Leiden University Hospital, Leiden, The Netherlands **[111]**

Camillia Smith, Department of Nephrology, Children's Hospital National Medical Center, George Washington University, Washington, DC **[901]**

Laura A. Smith, Department of Medical Microbiology and Immunology, University of Kentucky, Lexington, KY **[177]**

Josef Smolen, Department of Medicine II, University of Vienna, Vienna, Austria **[723]**

E. Charles Snow, Department of Medical Microbiology and Immunology, University of Kentucky, Lexington, KY **[177]**

Ralph Snyderman, Laboratory of Immune Effector Function, Howard Hughes Medical Institute, Durham, NC; present address: Division of Rheumatology and Immunology, Department of Medicine, Duke University Medical Center, Durham, NC **[205]**

Carol Soderberg, VA Medical Center and University of California-San Diego, San Diego, CA **[439]**

Scott D. Somers, Department of Pathology, Duke University Medical Center, Durham, NC **[3]**

Saburo Sone, 3rd Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[355]**

Harald Stein, Department of Pathology, Klinikum Steglitz Free University, Berlin, Federal Republic of Germany **[813]**

Daniel Steinberg, Department of Medicine, University of California-San Diego, La Jolla, CA **[301]**

Georg Steiner, Department of Dermatology I, University of Vienna, Vienna, Austria **[723]**

Georg Stingl, Department of Dermatology I, University of Vienna, Vienna, Austria **[723]**

Thomas P. Stossel, Hematology-Oncology Unit, Massachusetts General Hospital, Boston, MA; present address: Department of Medicine, Harvard Medical School, Boston, MA **[247]**

Bondada Subbarao, Department of Medical Microbiology and Immunology, University of Kentucky, Lexington, KY **[177]**

Taizan Suchi, Clinical Pathological Laboratory, Aichi Cancer Center, Nagoya, Japan **[791]**

Saraswati Sukumar, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD **[745]**

Hideki Sumimoto, Department of Biochemistry, Kyushu University School of Medicine, Fukuoka, Japan **[513]**

Junzo Sunamoto, Department of Industrial Chemistry, Faculty of Engineering, Nagasaki University, Nagasaki, Japan **[613]**

Hitoshi Suzuki, Department of Pediatrics, National Jewish Hospital and Research Center, Denver, CO; present address: Departments of Pediatrics, Biochemistry and Pathology, University of Colorado School of Medicine, Denver, CO **[535]**

Glen M. Swartz Jr., Walter Reed Army Medical Center, Washington, DC **[43]**

Takushi Tadakuma, Department of Microbiology, Keio University School of Medicine, Tokyo, Japan **[139]**

Toshiyuki Takagi, Department of Hematochemotherapy, Chiba Cancer Center Hospital, Chiba, Japan **[821]**

Kiyoshi Takahashi, 2nd Department of Pathology, Kumamoto University Medical School, Kumamoto, Japan **[735,887]**

Kiyoshi Takahashi, Department of Pathology, Kochi Medical School, Kochi, Japan **[735]**

Toshitada Takahashi, Laboratory of Cell Biology, Aichi Cancer Center, Nagoya, Japan **[791]**

Yoshimi Takai, Department of Biochemistry, Kobe University School of Medicine, Kobe, Japan **[221]**

Tsuyoshi Takami, Department of Pathology, Sapporo Medical College, Sapporo, Japan **[783]**

T. Takano, Department of Microbiology and Molecular Pathology, Faculty of Pharmaceutical Sciences, Teikyo University, Kanagawa, Japan **[323]**

Reiko Takemura, Laboratory of Radiobiology and Environmental Health, University of California, San Francisco, CA **[339]**

Koichiro Takeshige, Department of Biochemistry, Kyushu University School of Medicine, Fukuoka, Japan **[513]**

Tsutomu Takeuchi, Department of Parasitology, Keio University School of Medicine, Tokyo, Japan **[659]**

Masafumi Takiguchi, Department of Microbiology and Immunology, Lineberger Cancer Research Center, University of North Carolina, Chapel Hill, NC **[455]**

Norikazu Tamaoki. Department of Pathology, Tokai University School of Medicine, Kanagawa, Japan **[391]**

John D. Tamerius, Cytotech, San Diego, CA **[821]**

Tadayoshi Taniyama, Department of Cellular Immunology, National Institute of Health, Tokyo, Japan **[31]**

Wataru Tatewaki, Departments of Clinical Laboratory and Internal Medicine, National Cancer Center Hospital, Tokyo, Japan **[803]**

Tohru Tokunaga, Department of Cellular Immunology, National Institute of Health, Tokyo, Japan **[31]**

Akimitsu Tomonaga, 2nd Department of Internal Medicine, School of Medicine, Nagasaki University, Nagasaki, Japan **[613]**

Eiro Tsubura, 3rd Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[57,355]**

Terutaka Tsuda, Department of Biochemistry, Kobe University School of Medicine, Kobe, Japan **[221]**

Yukiko Tsunematsu, Department of Pediatric Hematology, National Children's Hospital, Tokyo, Japan **[855]**

Rikiya Tsunoda, Department of Pathology, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[827,881]**

Anne N. Tucker, Systemic Toxicology Branch TRTP, National Institute of Environmental Health Sciences, Research Triangle Park, NC **[563]**

Takafumi Uchida, Basic Research Laboratories, Toray Industries Inc., Kamakura, Japan **[545]**

Ryuzo Ueda, Laboratory of Chemotherapy, Aichi Cancer Center, Nagoya, Japan **[791]**

Yasuko Ueda, 2nd Department of Internal Medicine, School of Medicine, Nagasaki University, Nagasaki, Japan **[613]**

Jay C. Unkeless, Department of Cellular Physiology and Immunology, Rockefeller University, New York, NY **[407]**

Teruhiro Utsugi, 3rd Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[355]**

R. van Furth, Department of Infectious Diseases, Leiden University Hospital, Leiden, The Netherlands **[111]**

Beatrix Volc-Platzer, Department of Dermatology I, University of Vienna, Vienna, Austria **[723]**

Haruki Wakasa, Department of Pathology, Fukushima Medical College, Fukushima, Japan **[913]**

William S. Walker, Department of Immunology, St. Jude Children's Research Hospital, Memphis, TN **[673]**

Edward C. Ward, Department of Cell Biology, Chemical Industry Institute of Toxicology, Research Triangle Park, NC **[583]**

Hiroshi Watanabe, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Shaw Watanabe, Pathology Division, National Cancer Center Research Institute, Tokyo, Japan **[855]**

James E. Weiel, Department of Pathology, Duke University Medical Center, Durham, NC **[3]**

Katharine E. Wells, Glenolden Laboratory, E.I. duPont de Nemours and Company, Glenolden, PA **[363]**

Zena Werb, Laboratory of Radiobiology and Environmental Health, University of California, San Francisco, CA **[339]**

Masashi Yamaguchi, Departments of Clinical Laboratory and Internal Medicine, National Cancer Center Hospital, Tokyo, Japan **[803]**

Tetsuro Yamamoto, Department of Allergy, Institute for Medical Immunology, Kumamoto University Medical School, Kumamoto, Japan **[271]**

Yuichi Yamamura, President, Osaka University, Osaka, Japan **[597]**

Kazuhide Yamane, Department of Internal Medicine, Institutes of Clinical and Basic Medicine, University of Tsukuba, Ibaraki, Japan **[881]**

Takashi Yamashita, Department of Internal Medicine, University of Tokushima School of Medicine, Tokushima, Japan **[57]**

Uki Yamashita, Department of Immunology, University of Occupational and Environmental Health, School of Medicine, Kitakyushu, Japan **[97]**

Tatsuji Yasuda, Laboratory of Biological Products, Institute of Medical Science, University of Tokyo, Tokyo, Japan **[139]**

Shing-Erh Yen, Department of Immunology, St. Jude Children's Research Hospital, Memphis, TN **[673]**

Teizo Yoshimura, Department of Pathology, Kumamoto University Medical School, Kumamoto, Japan **[231]**

Masaru Yoshinaga, Department of Immunopathology, Kumamoto University Medical School, Kumamoto, Japan **[375]**

Junichi Yoshitake, Department of Anesthesiology, Kyushu University School of Medicine, Fukuoka, Japan **[513]**

Hiroo Yuasa, Department of Pathology, Sapporo Medical College, Sapporo, Japan **[783]**

Helmut Zarbl, Developmental Oncology Section, NCI-Frederick Cancer Research Facility, Frederick, MD **[745]**

Foreword

This series of books called PROGRESS IN LEUKOCYTE BIOLOGY was initiated under the auspices of the Reticuloendothelial Society and published by Alan R. Liss, Inc., the publisher of the *Journal of Leukocyte Biology*.

This series publishes papers of conferences, symposia and workshops concerned with leukocyte biology and related areas. Papers are reproduced by the camera-ready method for rapid publication. The publisher will endeavor to have volumes out within 3 months after receipt of the manuscripts.

Like its sister publication, the *Journal of Leukocyte Biology*, the PROGRESS IN LEUKOCYTE BIOLOGY series focuses on the biology of granulocytes, lymphocytes, and mononuclear phagocytes. This includes topics relating to the origins and developmental biology of these cells, their mechanism(s) of interpopulation communication, and the means by which they destroy infectious organisms, foreign tissue, or neoplastic cells.

In order to maintain the highest quality possible, there is an advisory board that recommends and approves conferences for publication in this series. The Publication Committee of the RES Society serves as the core of the board. In addition, a small number of key people throughout the world have been invited who are recognized for their expertise in granulocyte, lymphocyte, and macrophage biology.

This is an exciting area and it is growing in importance. We hope to capture the essence of this dialogue and continue to provide state-of-the-art coverage of this unfolding story.

Sherwood M. Reichard

Preface

The capability and versatility of the macrophage is extraordinary. These cells originate from bone marrow cells and are released as monocytes into the bloodstream. They migrate into tissues to become the macrophages or mononuclear phagocytes of the peritoneal cavity, lymphoid tissues, lung, liver and spleen. The specific tissue environment endows these cells with special functions and further differentiation may occur.

The macrophage plays a central role in both the stimulation and expression of immune response. This cell and other cells of the reticuloendothelial system (RES) provide a major defense against infectious agents, biological toxins and environmental pollutants, neoplastically transformed cells and mechanically produced injuries. The macrophage also has a vital role to play in homeostasis. It secretes a variety of endocrinelike mediators and enzymes that influence other cell types as well as other elements of the mononuclear phagocyte network. The delicately balanced and regulated processes of differentiation, lymphocytic and fibroblastic proliferation, hematopoiesis, tumoricidal and microbicidal activation, for example, are modulated by secretions such as colony stimulating factor, prostaglandins, complement, interferon gamma, and Interleukin-1.

Some products normally beneficial to the host may in excess or at the wrong site damage normal host tissues. Thus, Interleukin-1 which enhances metabolic alterations and the immune response may also stimulate synovial fibroblasts to produce collagenase which can be destructive to the rheumatoid synovium. Reactive oxygen species, proteases and lysosomal hydrolases which destroy phagocytosed bacteria, parasites and tumor cells may also damage tissues extensively when inappropriately released by the phagocytic cell. Interferon gamma appears to regulate a whole host of macrophage effector activities whereas its deficiency has been correlated with the development of certain progressive diseases such as leprosy.

The macrophage is well known to be an efficient phagocytic cell which continuously cleanses body fluids of particulate material, processes antigen, stores and metabolizes proteins and lipids. It is a motile cell with an abundance of actin filaments and actin-associated proteins in the cortical cytoplasm. It migrates directionally along gradients of chemoattractants.