

Georg Friedrich (Fritz) Melchers

Biographie und [Auswahl]Bibliographie (in englischer Sprache/in English)

born 1936 Berlin, Germany

Degrees:

- 1961 Dipl. chem., University of Cologne, Germany
- 1964 Ph.D. (Dr.rer.nat.), University of Cologne, Germany
- 1971 Dr. rer.nat. habil., Venia legendi, University of Freiburg i.Br. Germany (Faculty of Biology)

Positions held:

- 1965-1967 Research Associate, Salk Institute for Biological Studies, La Jolla, CA, USA (Fulbright Travel Scholar)
- 1968-1969 Postdoctoral Fellow, Max-Planck Institute for Molecular Genetics, Berlin, Germany
- 1970 Senior Research Assistant, Max-Planck Institute for Molecular Genetics, Berlin, Germany
- 1970 Visiting Scientist, Weizmann Institute, Rehovot, Israel
- 1970-1971 Visiting Scientist, Department of Genetics, Stanford University Medical School, Stanford, CA
- 1970-1980 Permanent Member, Basel Institute for Immunology, Basel, Switzerland
- 1980-2001 Director, Basel Institute for Immunology, Basel, Switzerland
- 2003- Senior Research Group Leader, Max Planck- Institute for Infection Biology, Berlin

In my appointment as Director of the Basel Institute for Immunology, from 1980-2001, I have selected, supported, guided, critically reviewed and integrated over 300 scientists with their research projects in most major fields of immunology, covering the innate and adaptive immune systems of many species, including human. Many of these scientists are now well-established senior members of the international community of immunologists, and molecular and cellular biologists. These scientists are the cores of a network of BII alumni. In June 2000, Roche decided to close the Institute and to terminate my assignment as Director. I remain a professor of immunology at the University of Basel and maintain a number of visiting appointments at other academic institutions.

In December 2002, I became, together with Drs. Ulf Grawunder and Dirk Haasner the Co-founder of 4-Antibody, a company that intends to produce and improve human antibodies. In the fall of 2003 I accepted an offer by the Max Planck-Institute for Infection Biology to head a Senior Research Group with which I intend to continue some of the research on stem cells and B cell development.

Teaching:

- 1971-1974 Faculty of Biology, University of Freiburg, Germany, Privatdozent
- 1973- Faculty of Biology, University of Heidelberg, Germany, Lehrauftrag
- 1980-1991 Wistar Institute, Philadelphia, PA, Visiting Professor
- 1981- Extraordinarius, Phil. II Faculty, University of Basel, Switzerland
- 1985- Advanced Course in Immunology. Institut Pasteur, Paris, France
- 1992- Jefferson Univ., Philadelphia, PA, Adjunct Professor
- 1999- Harvard University Medical School, Boston MA, Visiting Professor
- 2000- University of Innsbruck, Austria, Honorary Professor

From 1973 to 1979 I have provided the Faculty of Biology of the University of Heidelberg with lectures (50-60 hours per year) covering basic and applied immunology, as well as a three-week practical course in immunology, thereby establishing a curriculum in Immunology at the Biology Faculty. From 1980 until today I have done the same for the University of Basel. A 12-hour introductory lecture series on the basic principles and major applications of immunology was followed, on a yearly basis, by 50-60 hours of lectures and seminars in basic, applied and clinical immunology. In addition, an eight-day-long practical course in immunology was given with the course on cell biology at the Biozentrum of the University of Basel. Initially this was done together with Dr. Roland Gisler, in the last five years also with other members of the Basel Institute for Immunology. I have graduated students with work in my laboratory to Ph.D. With all these activities I have secured a curriculum in Immunology at the University of Basel.

Boards:

- 1986- Deutsches Rheuma-Forschungszentrum, Berlin, Germany
- 1986-1996 Paul Ehrlich Foundation, Frankfurt am Main, Germany
- 1992-1999 Max Delbrück Center for Molecular Medicine, Berlin-Buch, Germany, (Chairman of the Scientific Council)
- 1993-1996 Nationaler Forschungsrat der Schweiz, Bern, Switzerland
- 1996-2003 Member "Universitätsrat", University of Basel, Switzerland
- 1998-2001 President, IUIS (International Union of Immunological Societies)
- 2001-2004 Past President, IUIS
- 2002-2003 Member, Board of Directors Genescan AG, Freiburg i. Br., Germany
- 2002- 4-Antibody GmbH, Basel, Switzerland, Co-founder
- 2003- Member and Vice-President, Hochschulrat der Medizinischen Hochschule Hannover, Germany

Advisory and review activities:

- 1972- DFG (Deutsche Forschungsgemeinschaft)
Volkswagen-Stiftung
Fritz-Thyssen-Stiftung
- 1981-1987 MPI für Experimentelle Medizin, Göttingen
- 1981-1988 ISREC (Swiss Institute for Cancer Research), Lausanne
- 1982-1987 MPG (Max Planck-Gesellschaft), Spemann-Laboratories, Tübingen, Fachbeirat
- 1982-1987 EMBL (European Molecular Biological Laboratory)
- 1982-1987 Multiple Sclerosis Society, USA

1982-1987 National Institute of Immunology, New Delhi
 1982-1987 MPG, Institute for Immunobiology, Freiburg, Beirat
 1984-1988 GSF (Forschungszentrum für Umwelt und Gesundheit)
 1985 DNAX Research Institute, Stanford University, USA
 1985- BMFT (Bundesministerium für Forschung und Technologie)
 1985- DKFZ (German Cancer Research Center)
 1986 MPI für Züchtungsforschung, Universität Köln
 1986- MPL (Milano Molecular Pharmacology Laboratory)
 1989 ICP (International Institute of Cellular and Molecular Pathology) Belgium
 1989 EU Commission of the European Communities, Brussels
 1990-1992 Deutscher Wissenschaftsrat, Kommission zur Evaluierung der
 Biologisch-Medizinischen Akademie-Institute der ehemaligen DDR
 1990-2001 Hagedorn Institute, Copenhagen, Denmark
 1990- Georg Speyer Haus, Frankfurt a Main, Germany
 1991-1992 General Motors (Mott-) Prize
 1991 ICRF – Imperial Cancer Research Fund, Human Tumour Immunology
 Unit, London
 1992-1993 The Danish National Research Foundation, Hellerup
 1992-1993 HFSP – Human Frontier Science Program Organization, Strasbourg
 1993 Centre Pluridisciplinaire d'Oncologie (CPO), Lausanne University
 1993 TNO Institute of Applied Radiobiology and Immunology & Med. Biol.
 Labs., Koninklijke Nederlandse Akademie van Wetenschappen,
 Amsterdam
 1993 Peer Review – National Science Foundation, Washington DC
 1993- Österreichische Akademie der Wissenschaften, Kuratorium des Instituts
 für Altersforschung, Innsbruck
 1993- Centro de Investigaciones Biológicas, Madrid
 1994-1995 Kuratorium Departement Forschung der Universitätskliniken, Basel
 1995 CPO, Bellinzona
 1995- AIDS-Stiftung, Bern
 1995- Eppendorf Prize Committee
 1998-2001 GSF (Forschungszentrum für Umwelt und Gesundheit)
 1999- GIF (German-Israeli Foundation), Jerusalem
 2000- Technologie- und Innovationsbeirat des Landes Berlin, Berlin
 2000- FAG – Fonds zur Förderung von Lehre und Forschung der Freiwilligen
 Akademischen Gesellschaft, Basel
 2000- Nikolaus-Fiebinger-Zentrum für Molekulare Medizin, Universität Erlangen
 Nürnberg
 2001- Review Board of the 7-year evaluation of the Medical Faculty, University
 of Tübingen, Germany
 2002- Center of Molecular Medicine, Austrian Academy of Sciences, Vienna,
 Austria
 2002- BioVisioN AG Hannover, Germany
 2002- Rudolf Virchow Center for Experimental Biomedicine, University of
 Würzburg, Germany (Chairman of the Scientific Advisory Board)
 2003- Scientific Advisory Board, Apogenix, Heidelberg, Germany
 2003- Member and Vice-Chairman, Evaluation Board, Elitenetzwerk des
 Freistaats Bayern, Germany
 2003- Member and Chairman, Scientific Advisory Board of the Genom-
 Netzwerk Bayern, Germany

Among the many advisory and review activities I would like to mention three in more detail.

In 1985 the Government of Berlin asked me to help in the planning of a biomedical research center for rheumatoid arthritis, hoping that the success of the Basel Institute could be transplanted to Berlin. This has led to the foundation and successful establishment of the "Deutsche Rheumaforschungszentrum" (DRFZ), under the past directorship of Avrion Mitchison, and the present directorship of Andreas Radbruch. The center is housed at the Charité, together with the Max Planck Institute for Infectious Biology, and is engaged in research on autoimmune diseases in close collaboration with the Chair of Rheumatology. I am a member of the Stiftungsrat of the DRFZ.

In 1990 the German Science Council (Wissenschaftsrat) asked me to participate in the review of 17 biomedically oriented institutions of the Academy of the former German Democratic Republic. As a consequence of this review, a new foundation for research in molecular medicine was proposed for the former Institutes of Molecular Genetics, Cancer and Cardiovascular Diseases in Berlin-Buch.

I became co-chairman of the founding committee, and later chairman (until 1998) of the Scientific Council of the Kuratorium of the research center, named the Max Delbrück Center for Molecular Medicine, and headed by Professor Detlev Ganten.

In 1987 the German Society for Immunology asked me to organize the scientific program of the 125 workshops and 25 symposia of the 7th International Congress of Immunology, held in Berlin in 1989 and attended by over 7000 participants active in basic, applied and clinical immunology.

As a permanent scientific member (1970-1980) and as director (1980-2001) of the Basel Institute for Immunology (which was an academically free research institute, wholly supported by F. Hoffmann-La Roche during its entire 30 years of operation) I have restricted my consultant-ships for commercial companies to giving Roche, especially in the areas of gene expression and protein production, monoclonal antibodies in diagnosis and therapy, cytokines and cytokine receptors (IL-1, TNF- α , etc.) in inflammation and autoimmune diseases, and vaccine developments, especially against influenza and malaria.

After my retirement I began consulting for law firms and biotech companies. In 2003 I became Senior Research Group Leader at the Max Planck Institute for Infection Biology, Berlin, Germany.

Memberships:

Deutsche Gesellschaft für Biologische Chemie, Germany

Deutsche Gesellschaft für Genetik, Germany

Deutsche Gesellschaft für Immunologie (DGI), Germany; President Elect 1991/2, President 1993/4, Past President 1995/6

British Society for Immunology

Swiss Society for Allergology and Immunology

EMBO (European Molecular Biology Organization), Heidelberg

FASEB (Federation of American Societies for Experimental Biology)

Gesellschaft der deutschen Naturforscher und Aerzte, Germany

Gesellschaft für Fortschritte auf dem Gebiet der Inneren Medizin, Germany

Academia Europea

European Academy of Allergology and Clinical Immunology (EAACI)

European Network of Immunology Institutes (Treasurer)

Deutsche Akademie der Naturforscher, LEOPOLDINA, Obmann für Immunologie
Foreign Member Norwegian Academy of Science and Letters, Oslo
Swiss Academy of Medical Sciences (Einzelmitglied)
Henry Kunkel Society, New York (2002-05Member of the Council)

Editorial boards:

1971-1991 Eur. J. Immunol.
1971-1974 Immunochem.
1976- Curr. Top. Microbiol. Immunol.
1980- Scand. J. Immunol.
1981-1985 Cell Different.
1981- Devel. Comp. Immunol.
1981-1998 Immunol. Today
1982-1986 EMBO J.
1983-1985 Molec. Biol. Med.
1987- Act. path. micr. imm. scand.
1988-1995 Biol. Chem. Hoppe-Seyler
1989- Intern. Immunol.
1990- Curr. Protocols in Immunol.
1990- Adv. In Immunol.
1991 APMIS
1992- Curr. Op. Immunol.
1995- J. Mol. Medicine
1997- Immunity
1998- J. Exp. Medicine
2000- Intern. Arch. Allergy Immunol.
2000- Faculty of 1000

Organization of scientific meetings:

1981-2000 Mechanisms of B cell neoplasia, yearly workshops held alternatively at the Basel Institute for Immunology and at the National Cancer Institute, NIH, Bethesda, MD, USA
1982-1985 IUIS, Chairman of Symposium Committee, Symposia in Austria, Spain and Brazil
1983 5th International Congress of Immunology, Kyoto, Japan, Member, Advisory Board
1986 6th International Congress of Immunology, Toronto, Canada, Member, Advisory Board
1987 International Titisee Conference on Proteolytic Processing and Biological Function, Co-organizer
1987-1989 7th International Congress of Immunology, Berlin, Germany, Chairman of the Program Committee
1987- ENII, Treasurer
1987-1992 Hinterzartener Kreis, Member of organizing group
1986- San Marino Conferences, Member of Scientific Advisory Board
1989 San Marino Conference, Co-Chairman (with Dr. D. Bolognesi)
1998 San Marino Conference, Co-Chairman (with Dr. L. Chieco-Bianchi)

- 1988 14th International Congress of Biochemistry, Prague, CSSR, Member, Advisory Board
- 1988-1990 European Immunology Meeting, Edinburgh, Scotland, Member of Advisory Board
- 1990 Retroviruses and Autoimmunity, Workshop at the Basel Institute for Immunology
- 1989 11th International Congress of Developmental Biology, Utrecht, Holland, Member, Advisory Board
- 1992 8th International Congress of Immunology, Budapest, Hungary, Member, Advisory Board
- 1992 Retroviruses, Superantigens and Autoimmunity, Workshop at the Basel Institute for Immunology
- 1993 European Immunology Meeting, Barcelona, Member of Advisory Board
- 1994 Titisee Conference on "Lymphopoiesis", chairman and organizer
- 1995 9th International Congress of Immunology, San Francisco, USA, Member, Advisory Board
- 1996-1998 10th International Congress of Immunology, New Delhi, India, Advisory Board
- 1997 13th European Immunology Meeting, Amsterdam, The Netherlands, Advisory Board
- 1999-2001 11th International Congress of Immunology, Stockholm, Advisory Board
- 2000 14th European Immunology Meeting, Poznan, Poland, Advisory Board
- 2001-2003 12th International Congress of Immunology, Montreal, Canada

Alternating between the National Cancer Institute, National Institutes of Health in Bethesda/MD and the Basel Institute for Immunology in Switzerland, Dr. Michael Potter and I have organized for 20 years the B cell neoplasia workshops as a forum for discussions on normal B cell development and responses, their deregulations in cancers of the B lymphocyte lineage and the steps that lead to malignant transformation of the normal cells.

Awards:

- 1978 Honorarprofessor, Fakultät für Biologie, Universität Heidelberg, Germany
- 1988 Commendatore dell Ordine di Sant' Agata, San Marino
- 1990 M.D.h.c., University of Turku, Finland
- 1994 Ph.D.h.c., Medical College, Thomas Jefferson University, Philadelphia, USA
- 1995 Bundesverdienstkreuz 1. Klasse der Bundesrepublik Deutschland
- 1996 Prausnitz-Medaille, Collegium Internationale Allergologiaun (CIA), Vienna
- 1996 Robert-Koch Prize, Bonn, Germany
- 2000 San Marino Prize 2000
- 2001 Honorarprofessor, Fakultät für Medizin, Universität Innsbruck
- 2002 Emil von Behring Preis, Marburg, Germany
- 2002 External Scientific Member (Auswärtiges Wissenschaftliches Mitglied), Max Planck Institute for Infection Biology, Berlin, Germany
- 2002 Gaikokujin Chomei Kenkyu-shu(Eminent Scientist) Award of the Japanese Society for the Promotion of Science (JSPS) at the University of Tokyo School of Medicine
- 2003 M.D.h.c., University of Erlangen- Nürnberg, Germany
- 2006 Ph.D.h.c. University of Leipzig, Germany

2006 M.D.h.c. University of Würzburg, Germany
2007 Johannes Gutenberg Endowed Professorship, University of Mainz

Memberships in Academies:

Academia Europea
Leopoldina
Norwegian Academy of Science
Swiss Academy of Medical Sciences
American Academy for Arts and Science

Honorary memberships in immunological societies:

1973 India
1981 USA
1984 Scandinavia
1987 Hungary
1999 Switzerland
2001 Germany
2002 Austria
2003 Japan

Scientific achievements:

My scientific interests in the laboratory have, over 35 years, been centered on B-lymphocytes in normal immune reactions, and in autoimmune, immunodeficient and malignant diseases. I have studied their development from pluripotent hematopoietic stem cells, the generation of their antibody repertoires as receptors and secreted effector molecules, the molecular mechanisms which control proliferation, allelic exclusion and antibody repertoire selection, and those which control proliferation and differentiation to Ig H chain-class-switched, hypermutated Ig-secreting plasma cells, with and without the help of T-lymphocytes.

My studies began at the end of the developmental pathway of B cells, with the biochemistry of Ig molecules in B cells and plasma cells. One major focus was the role of the carbohydrate moieties of Ig in the process of intracellular transport, surface deposition and secretion of Ig in B cells and plasma cells.

Next, the molecular status of a resting mature B cell and its change after activation was defined by cell cycle analysis, by Ig synthesis and turnover, and by reactivities to a series of polyclonal activators and cytokines. A plaque test using protein A was developed. It allowed the detection of all Ig-secreting cells resulting from polyclonal or antigen-specific stimulation as single cells. Tissue cultures in serum-free medium were perfected, so that one of three mature B cells could be stimulated to grow into a clone of proliferating, increasingly Ig-secreting cells, with cloning efficiencies near 100%. This, for the first time allowed a quantitation of B cell responses "in vitro" and "in vivo" to mitogens and to then newly available helper T cell clones. It also allowed defining B cell defects of immunodeficient and of autoimmune-prone mice, and of graft-versus-host diseased animals.

Within the last fifteen years, three seminal discoveries have been made. One is the discovery of the structure and function of the surrogate light chain in precursor B cell selection and expansion, one key molecule in B cell development of mouse, man and other species. Two precursor B cell-specific genes, λ 5 and μ 2 were identified which encode two polypeptide chains forming the surrogate light chain. When μ 2 chains are first expressed during B cell development a preB cell receptor with surrogate light chain can be expressed on the cell surface. Whenever that happens, the preB cells enter between 2 and 7 divisions, forming between 4 and 100 precursor cells with the same rearrangements in which now L chain gene can happen. Whether the preB cell receptor also signals, allelic exclusion remains an unsolved problem. Immunodeficiencies involving mutations in λ 5 gene have been found in humans and result in similarity extensive B cell immunodeficiencies.

In the second discovery, pre-adipocytic fibroblast cell lines and recombinant IL-7 were found to allow, with 100% cloning efficiency, to clone and propagate single pre-BI cells in culture for weeks and months. This proliferative capacity of pre-BI cells has recently been tested to break the "Hayflick-barrier", since such pre-BI cells (from different strains of mice) can proliferate for at least 150 divisions. Transplantation of such wild type pre-BI cells into severe combined immunodeficient (i.e. SCID or RAG) recipients establish BI-like compartments, which can be converted to conventional B cell compartments in the host by the co-transplantation of CD4 helper T cells. The transplanted precursors do not home back to the bone marrow. The transplanted B cells are tolerant to auto-antigens of the host. In humans such transplantation should allow a selective reconstitution of the antibody-producing B cell compartments.

The transition from immature B cells in bone marrow to marrow B cells in spleen has been genetically divided into two steps: immature cell transition from bone marrow to spleen, followed by maturation in the spleen from immature to mature cells. Again, immunodeficiencies and autoimmune-prone situations have been analyzed which affect these steps of B cell development.

The third discovery led to the isolation of a multipotent, long-term reconstituting hematopoietic stem cell from PAX-5-deficient mice, which has opened new, exciting possibilities to study and to manipulate the molecular and cellular programs of development of most cells of the innate and adaptive immune system. These cells, once obtainable from humans, are likely to revolutionize the practice of bone marrow transplantation in the treatment of cancer and autoimmune diseases, and in gene therapy of hematopoietic and lymphopoietic deficiencies and deregulations.

With this work our laboratory has developed into a reference center for the analysis of B cell developmental defects in immunodeficient, autoimmune-diseased and premalignant mice, with limited application to human diseases.

Beyond my experimental scientific interests I have had the privilege to develop a comprehensive view of the immune system, not only because I have attempted to teach immunology to students, but because for twenty years, as the director of the BII, I have introduced the research projects of the fifty scientists, fifteen students and twenty visitors that were undertaken at any year at the institute. My views of the immune system during 1980-2000 can be read in the introductions to the Annual Reports of the Basel Institute for Immunology.

Contributions to Books/Reviews

1. Zachau, H.G., Dütting, D., Melchers, F., Feldmann, H., Thiebe, R.: On serine-specific transfer ribonucleic acids. Symp. Federation European Biochemical Societies, Vienna, p. 21, Pergamon Press, Oxford, 1965.
2. Melchers, F.: The N-terminal amino acid sequence in a k-type mouse light chain. FEBS-Symposium, Vol. 15, Prague, pp. 169-175, 1969.
3. Melchers, F.: Symposium der deutschen Forschungsgemeinschaft über Glykosaminoglykane und Glykoproteine, Bochum, 1968. Hoppe-Seyler's Z. Physiol. Chem., 350:670, 1969.
4. Melchers, F.: The structure, genetics and formation of antibodies. The carbohydrate composition of a myeloma protein from different subcellular fractions of plasma cells. Behr. Mitt. 49:169-183, 1969.
5. Antibody Workshop Meeting, Kronberg, Taunus, Germany, 1969.
6. Melchers, F.: Die Bildung von Antikörpern. Umschau in Wissenschaft und Technik, Heft 4, S. 105, 1969.
7. Messer, W., Melchers, F.: The activation of mutant β -galactosidase by specific antibodies. In: "The Lactose Operon," ed. D. Zipser, Cold Spring Harbor Monographs, p. 305, 1970.
8. Melchers, F.: Biosynthesis, transport and secretion of immunoglobulin in plasma cells. Histochem. J. 3:389-397, 1971.
9. Melchers, F., Köhler, G., Messer, W.: Stabilization of conformations of Escherichia coli beta-galactosidase by specific antibodies. In: 23rd Mossbach Colloquium of the Germany Society for Biological Chemistry on Protein-Protein Interactions, pp. 409-425, Springer, Berlin, 1972.
10. Melchers, F.: Synthesis, transport and secretion of immunoglobulins. "Immunoglobulins," pp. 49-59, North Holland, Amsterdam, 1972.
11. Melchers, F.: Synthesis, transport and secretion of immunoglobulin in lymphoid cells. In: "Biochemistry of Gene Expression in Higher Organisms," Sydney, eds. J.K. Pollak, J.W. Lee, pp. 542-554, Australia and New Zealand Book Co., Sydney, 1973.
12. Melchers, F.: Possible roles of the carbohydrate groups in biological functions of the glycoproteins, immunoglobulin M and G. In: "Int. Symp. Membrane-mediated Information," Oxford 1972, ed. P.W. Kent, Vol. 2, pp. 39-56, MTP, Lancaster, 1973.
13. Melchers, F., Andersson, J.: Secretion of immunoglobulins. Adv. Cytopharm. 2:225-235, 1974.
14. Melchers, F., Andersson, J.: Proliferation and maturation of bone marrow-derived lymphocytes. In: "Cellular Selection and Regulation in the Immune Response," ed. G.M. Edelman, pp. 217-231, Raven Press, New York, 1974.
15. Andersson, J., Melchers, F.: The differentiation of B cells by mitogens. In: "Progress in Immunology II," eds. L. Brent, J. Holborow, pp. 127-135, North-Holland, Amsterdam and American Elsevier, New York, 1974.
16. Melchers, F.: Lymphocyte membranes in lymphocyte functions. In: "Perspectives in Membrane Biology," eds. S. Estrada-O., C. Gitler, pp. 531-558, Academic Press, New York, 1974.
17. Melchers, F., Andersson, J.: Immunoglobulin production in B-lymphocytes: synthesis of the membrane-bound receptor and the secreted serum glycoprotein immunoglobulin M. Biochem. Soc. Symp., 40:73-85, 1974.
18. Melchers, F., Lafleur, Anderson, J.: Immunoglobulin M synthesis in resting (Go) and in mitogen-activated B-lymphocytes. In: "Control of Proliferation in Animal Cells", Cold Spring Harbor Laboratory, pp. 393-410, 1974.
19. Melchers, F.: Changes in receptor immunoglobulin turnover during B-lymphocyte differentiation. In: "Molecular Aspects of Membrane Phenomena," eds. H.R. Kaback et al., pp. 64-72, Springer-Verlag, Berlin, 1975.

20. Melchers, F.: Biochemical characterization of immunoglobulin-producing B-lymphocytes at different stages of their differentiation. In: "Regulation of Growth and Differentiated Function in Eukaryotic Cells," eds. P. Talwar, B. de Monte, pp. 229-234, Raven Press, New York, 1975.
21. Andersson, J., Melchers, F.: Lymphocyte stimulation by Con A. In: "Concanavalin A as a Tool," eds. H. Bittiger, H.P. Schnebli, pp. 505-522, J. Wiley and Sons, London, 1976.
22. Melchers, F.: Immunoglobulin synthesis and mitogen reactivity: markers for B lymphocyte differentiation. In: "Development of Host Defenses," eds. M.D. Cooper, D.H. Dayton, pp. 11-29, Raven Press, New York, 1977.
23. Andersson, J., Melchers, F.: Mitogen stimulation of B lymphocytes. A mitogen receptor complex which influences reactions leading to proliferation and differentiation. In: *Cell Surface Reviews* 3:601-618, 1977.
24. Melchers, F.: T-cell hybrids: shortcut or dead end? *Nature* 271:9-10, 1977.
25. Phillips, R.A., Melchers, F., Miller, R.G.: Stem cells and the ontogeny of B lymphocytes. *Progr. Immunol.* Vol. III, 155-161, 1977.
26. Melchers, F., Pernis, B., Krolick, K.A.: Membranes and signalling. In: "Regulation of the Immune System: Genes and the Cells in which They Function," Vol. VI, eds. E. Sercarz, L. Herzenberg, F. Fox, pp. 747-752, Academic Press, New York, 1977.
27. Melchers, F.: Receptors for the regulation of growth and differentiation of murine B-lymphocytes. In: "Regulations of Membrane Origin," eds. P. Guerrier, N. Moreau, *Biologie Cellulaire* 32:9-18, 1978.
28. Melchers, F., Potter, M., Warner, N.L.: Preface to "Lymphocyte Hybridomas". *Curr. Topics Microbiol. Immunol.* 81, IX XXIII, 1978.
29. Melchers, F.: B-lymphocyte development and growth regulation. In: "Differentiation of Normal and Neoplastic Hematopoietic Cells," eds. B. Clarkson, P.A. Marcks, J.E. Till, *Cold Spring Harb. Conf. Cell Prolif.* 5:485-503, 1978.
30. Andersson, J., Coutinho, A., Melchers, F.: The role of immunoglobulin in the induction of B-lymphocytes. In: "Cells of Immunoglobulin Synthesis" eds. B. Pernis, H.J. Vogel, pp. 209-221, Academic Press, New York, 1979.
31. Melchers, F.: Synthesis and processing of immunoglobulins. In: "Processing and Turnover of Proteins and Organelles in the Cell", eds. S. Rapoport, T. Schewe, *FEBS 12th Meeting Dresden 1978*, Vol. 53, pp. 57-69, Pergamon Press, Oxford & New York, 1979.
32. Andersson, J., Coutinho, A., Lernhardt, W., Melchers, F.: B cell triggering. In: "B Lymphocytes in the Immune Response," eds. M. Cooper, D. Mosier, I. Scher, E.S. Vitetta, pp. 257-262, Elsevier/North Holland, Inc., New York, 1979.
33. Melchers, F.: Discussions on triggering and tolerance in B-cells. In: "B Lymphocytes in the Immune Response," eds. M. Cooper, D. Mosier, I. Scher, E.S. Vitetta, pp. 271-274, Elsevier/North Holland Inc., New York, 1979.
34. Melchers, F.: Three waves of B lymphocyte development during embryonic development of the mouse. In: "Cell Lineage, Stem Cells and Cell Determination," ed. N. Le Douarin, pp. 281-288, Elsevier/North-Holland Biomed. Press, Amsterdam, 1979.
35. Melchers, F.: Organization of immunoglobulin synthesis. In: "Cell Compartmentation and Metabolic Channeling," eds. F. Nover, F. Lynen, K. Mothes, pp. 447-452, G. Fischer-Verlag, Jena, 1980.
36. Melchers, F., Andersson, J.: Different qualities of B lymphocyte mitogens. In: "Microbiology 1980," American Society for Microbiology, pp. 16-18, 1980.
37. Melchers, F., Andersson, J., Lernhardt, W., Schreier, M.H.: Functional studies on receptor complexes of B lymphocytes involved in regulation of growth and maturation. In: "The Lymphocyte Cell Surface," eds. P.B. Garland, M.J. Crumpton, pp. 75-88, The Biochemical Society, London, 1980.
38. Melchers, F.: Interactions of bacteria with the immune system. In: "The Molecular Basis of Microbial Pathogenicity," eds. H. Smith, J.J. Skehel, M.J. Turner, pp. 285-305, Verlag Chemie, Weinheim, West Germany, 1980.

39. Melchers, F.: T cell-dependent B cell stimulation in the mouse. In: "Primary Immunodeficiencies," eds. M. Seligmann, W.H. Hitzig, pp. 173-177, Elsevier/ North Holland Biomedical Press, Amsterdam, 1980.
40. Melchers, F.: Theme 3: Summary. Expression of Antigen Receptors in Lymphocytes and Cellular Activation Mechanisms," *Prog. Immunol.* 4:202-206, 1980.
41. Melchers, F., Andersson, J., Lernhardt, W., Schreier, M.H.: Roles of surface bound immunoglobulin molecules in regulating the replication and maturation to immunoglobulin secretion of B lymphocytes. *Immunol. Rev.* 52:89-114, 1980.
42. Andersson, J., Melchers, F.: T cell-dependent excitation and stimulation of B cells. In: "B Lymphocytes in the Immune Response," eds. N. Klinmann, D.E. Mosier, I. Scher, E.S. Vitetta, pp. 307-314, Elsevier/ North Holland, New York, 1981.
43. Melchers, F., Andersson, J., Lernhardt, W., Schreier, M.H.: Cellular interaction and the environment in lymphocyte development: the roles of antigen, histocompatibility, and growth factors in T cell-dependent B cell stimulation. In: "Control of Cellular Division and Differentiation," eds. D. Cunningham, E. Goldwasser, J. Watson, C.F. Fox, pp. 579-588, A. Liss, Inc., New York, 1981.
44. Melchers, F., Andersson, J.: T cell dependent regulation of antibody by B cells. In: "The Menarini Series on Immunopathology," Vol. 3, Immunogenetics, eds. L. Bolis, G. Torrigiani, pp. 19-22, 1981.
45. Melchers, F., Andersson, J.: Exciting B cells. In: "The Immune System. Festschrift in Honor of Niels Kaj Jerne on the Occasion of his 70th Birthday," Vol. I, eds. C.M. Steinberg, I. Lefkovits, pp. 124-131, Karger, Basel, 1981.
46. Melchers, F.: Continuously growing lines and clones of antigen-committed T- and B-lymphocytes. In: "Biological Products for Viral Diseases," ed. P.A. Bachmann, pp. 173-180, Taylor and Francis Ltd., London, 1981.
47. Melchers, F.: Introduction. In: "Basel Institute for Immunology Annual Report 1980", Basel Institute for Immunology, pp. 1-18, 1981.
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