

SIEGMUND J. BAUM
G. DAVID LEDNEY

EXPERIMENTAL HEMATOLOGY TODAY 1978



SPRINGER - VERLAG
NEW YORK HEIDELBERG BERLIN

Experimental Hematology Today 1978

Edited by
Siegmond J. Baum
G. David Ledney

With 90 illustrations



Springer-Verlag New York Heidelberg Berlin

Siegmund J. Baum
Chairman, Experimental Hematology Department
Armed Forces Radiobiology Research Institute
Defense Nuclear Agency
Bethesda, Maryland 20014

G. David Ledney
Head, Immunology Division
Experimental Hematology Department
Armed Forces Radiobiology Research Institute
Defense Nuclear Agency
Bethesda, Maryland 20014

Library of Congress Cataloging in Publication Data

Main entry under title:

Experimental hematology today 1978.

“Presented at the sixth annual meeting of the International Society for Experimental Hematology, held in Basel, Switzerland, 1977.”

Includes bibliographical references and index.

1. Hematology, Experimental—Congresses. I. Baum, Siegmund J. II. Ledney, G. David. III. International Society for Experimental Hematology. [DNLN: 1. Hematology—Congresses. WH20 I6le 1977]

RB145.E98 616.1'5 78-8054

ISBN 0-387-90323-2

All rights reserved.

No part of this book may be translated or reproduced in any form without written permission from Springer-Verlag.

Copyright © 1978 by Springer-Verlag New York Inc.

Printed in the United States of America.

9 8 7 6 5 4 3 2 1

ISBN 0-387-90323-2 Springer-Verlag New York Heidelberg Berlin

ISBN 3-540-90323-2 Springer-Verlag Berlin Heidelberg New York

Experimental
Hematology
Today 1978

Preface

Experimental Hematology Today 1978 represents a group of papers demonstrating significant advances in the field for the past year, which were presented at the Sixth Annual Meeting of the International Society for Experimental Hematology held in Basel, Switzerland, in 1977, and selected by the local committee. The papers are divided into six parts, three of which primarily represent the basic sciences while the other three show advances in clinical application. The greater emphasis on clinical application in this book may indicate the final fruition and utilization of previously completed basic research.

The first part, chaired by Dr. L. G. Lajtha, Manchester, England, is entitled "Regulation of Stem Cell Proliferation" and deals with further characterization of the still rather elusive multipotential stem cell. This is followed by Part II entitled "Physiology of Committed Stem Cells" under the chairmanship of Dr. D. Metcalf, Victoria, Australia. In this division of papers, experimenters attempt to create order and better understanding of the various stages of committed stem cells, utilizing the most recent laboratory data. Dr. S. Thierfelder, Munich, Germany, chaired the important part III on "Transplantation Immunology." In this part, authors discuss recent findings in clinical observations and animal experimentation for possible improvement of bone marrow transplantation in man. Chairman Dr. B. Speck, Basel, Switzerland, led Part IV, "Therapeutic Approaches to Aplastic Anemia." Authors of papers in this group attempt to give a better understanding of the pathogenesis of this disease and of ways of improvement for better therapy. Part V, entitled "Treatment of Leukemia" and chaired by Dr. G. S. Santos, Baltimore, Maryland, deals with recent advances in the treatment of this disease. Finally, Part VI entitled "Advances in Experimental Hematology" is comprised of a set of papers in which the authors point toward possibly new horizons in hematological research. This section was chaired by Dr. D. H. Pluznik, Ramat-Gan, Israel.

Descriptions of the most recent advances in basic as well as in clinical hematology are contained in this yearbook that will be valuable to experimental and clinical scientists.

Acknowledgment

The International Society for Experimental Hematology wishes to acknowledge the generous assistance provided by the following agencies of the

United States government. Defense Nuclear Agency, Armed Forces Radiobiology Research Institute.

Furthermore, we greatly appreciate the generous financial support by the Swiss pharmaceutical

firms, Hoffman-LaRoche and Ciba-Geigy, and by the American firm, Travenol.

SIEGMUND J. BAUM
G. DAVID LEDNEY

List of Contributors

- N. Abuaf, Institut de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- Solomon S. Adler, Section of Hematology, Department of Medicine, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois, 60612
- A. Ahmed, Naval Medical Research Institute, Bethesda, Maryland, 20014
- Ron N. Apte, Department of Life Sciences, Bar-Ilan University, Ramat-Gan, Israel
- J. J. Ballet, Groupe de recherches d'Immunologie et de Rhumatologie Pédiatriques, Unité INSERM U 132, Pr. P. Mozziconacci, Hôpital des Enfants Malades, 75015, 149 Rue de Sèvres, Paris, France
- Siegmund J. Baum, Ph.D., Chairman, Experimental Hematology Department, Defense Nuclear Agency, Armed Forces Radiobiology Institute, Bethesda, Maryland, 20014
- B. M. Berardet, Institute de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- L. Berumen, Institut de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- A. B. Bijnen, Laboratory for Experimental Surgery, Erasmus University, Rotterdam, The Netherlands
- B. A. Bradley, Department of Immunohaematology, University Hospital Leiden, The Netherlands
- Hal E. Broxmeyer, Memorial Sloan-Kettering Institute for Cancer Research, New York, New York, 10021
- S. Bruno, M.D., Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- C. D. Buckner, Fred Hutchinson Cancer Research Center, Seattle, Washington 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- M. Castes, Institute de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- G. Christoff, Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- Diane de Cicco, Imperial Cancer Research Fund, London, United Kingdom
- R. A. Clift, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- T. J. Contreras, Physiology Division Experimental Hematology Department, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, 20014

- P. Cornu, Division of Hematology, Department of Internal Medicine, Kantonsspital Basel and Transplantation Immunology Unit, Hôpital Cantonal, Geneva, Switzerland
- A. Cruchaud, Division of Immunology and Allergology, Department of Medicine, Geneva University Medical School, Hôpital Cantonal, Geneva 4, Switzerland
- F. Daguiard, Groupe de recherches d'Immunologie et de Rhumatologie Pédiatriques, Unité INSERM U 132, Pr. P. Mozziconacci, Hôpital des Enfants Malades, 75015, Paris, France
- P. Dörmer, Abt. Experim. Hämatologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- A. Durandy, Groupe de recherches d'Immunologie et de Rhumatologie Pédiatriques, Unité INSERM U 132, Pr. P. Mozziconacci, Hôpital des Enfants Malades, 75015, Paris, France
- Ger van den Engh, Radiobiological Institute TNO, 151 Lange Kleiweg, Rijswijk, The Netherlands
- A. Fefer, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- V. Von Flidner, M.D., Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- G. L. Floersheim, Kantonsspital Zurich, Dermatologische Universitäts-Klinik, Zurich, Switzerland
- W. J. Flor, Physiology Division, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, 20014
- J. E. French, Physiology Division, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, 20014
- Ralph van Furth, Department of Infectious Diseases, University Hospital, Leiden, The Netherlands
- Robert Peter Gale, UCLA Bone Marrow Transplant Unit, UCLA School of Medicine, The Center for the Health Sciences, Los Angeles, California, 90024
- A. L. Goldstein, University of Texas Medical Branch, Galveston, Texas, 77550
- Ch. Bender Götze, Kinderpoliklinik der Universität München, Munich, West Germany
- B. W. Goodell, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- Theo J. L. M. Goud, Department of Infectious Diseases, University Hospital, Leiden, The Netherlands
- E. Goulmy, Department of Immunohaematology, University Hospital Leiden, The Netherlands
- C. Griscelli, Groupe de recherches d'Immunologie et de Rhumatologie Pédiatriques, Unité INSERM U 132, Pr. P. Mozziconacci, Hôpital des Enfants Malades, 75015, Paris, France
- M. P. Grissom, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, 20014
- P. Groff, Division of Hematology, Department of Internal Medicine, Kantonsspital Basel and Transplantation Immunology Unit, Hôpital Cantonal, Geneva, Switzerland
- H. Gross-Wilde, Institut für Strahlen-und Umweltforschung, München, 8 München 2, Landwehrstr. 61, West Germany
- R. J. Haas, Universitätskinderklinik im Dr. von Haunerschen Kinderspital, Munich, West Germany
- O. Halle-Pannenko, Institut de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- George Hausner, Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- Eliahu Heller, Department of Life Sciences, Bar-Ilan University, Ramat-Gan, Israel
- Chanita F. Hertogs, Department of Life Sciences, Bar-Ilan University, Ramat-Gan, Israel
- G. Hoffmann-Fezer, Abt. Immunologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- D. Huhn, Abt. Klin. Hämatologie des Institutes für Hämatologie, GSF, München, West Germany
- Niels Jacobsen, Memorial Sloan-Kettering Institute for Cancer Research, New York, New York, 10021
- G. Jäger, Abt. Experim. Hämatologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- M. Jeannet, Transplantation Immunology Unit, Hôpital Cantonal, Geneva, and Division of Haematology, Kantonsspital Basel, Switzerland
- W. W. Jedrzejczak, Naval Medical Research Institute, Bethesda, Maryland, 20014
- J. F. Jemionek, Physiology Division, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, 20014
- F. L. Johnson, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195

- G. R. Johnson, Cancer Research Unit, Walter and Eliza Hall Institute, Royal Melbourne Hospital, P.O. Box 3050, Victoria, Australia
- A. C. M. Van Kessel, Radiobiological Institute GO-TNA, Rijswijk, The Netherlands
- H. Kolb, Institut für Biologie der Gesellschaft für Strahlen- und Umweltforschung, München, Abteilung für allgemeine und experimentelle Pathologie, 8042 Neuherberg, Ingolstädter Landstrasse 1
- H. J. Kolb, Institut für Hämatologie der Gesellschaft für Strahlen- und Umweltforschung, München, 8 München 2, Landwehrstr. 61, West Germany
- Jeffrey I. Kurland, Department of Developmental Hematopoiesis, Gar Reichman Laboratory for Advanced Cancer Research, Sloan-Kettering Institute for Cancer Research, New York, New York, 10021 and Cornell University Medical College, New York, New York, 10021
- Richard D. Kuznetsky, Section of Hematology, Department of Medicine, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois, 60612
- L. G. Lajtha, Paterson Laboratories, Christie Hospital and Holt Radium Institute, Withington, Manchester, England M20 9BX
- B. Lau, Abt. Experim. Hämatologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- G. D. Ledney, Division of Immunology, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, National Naval Medical Center, Bethesda, Maryland, 20014
- A. van Leeuwen, Department of Immunohaematology, University Hospital Leiden, The Netherlands
- T. J. MacVittie, Division of Hematology, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, National Naval Medical Center, Bethesda, Maryland, 20014
- G. Mathe, Institut de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- D. Metcalf, Cancer Research Unit, Walter and Eliza Hall Institute, Royal Melbourne Hospital, P.O. Box 3050, Victoria, Australia
- M. A. S. Moore, Memorial Sloan-Kettering Institute for Cancer Research, New York, New York, 10021
- A. Munro, Department of Immunohaematology, University Hospital Leiden, The Netherlands
- P. E. Neiman, Scholar of the Leukemia Society of America, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- B. Netzel, Abt. Immunologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- C. Nissen, Division of Hematology, Department of Internal Medicine, Kantonsspital Basel and Transplantation Immunology Unit, Hôpital Cantonal, Geneva, Switzerland
- H. Obertop, Laboratory for Experimental Surgery, Erasmus University, Rotterdam, The Netherlands
- S. Orbach-Arbouys, Institute de Cancérologie et d'Immunogénétique, Groupe Hospitalier Paul Brousse, 94800 Villejuif, France
- G. A. Parker, Division of Comparative Pathology, Armed Forces Radiobiology Research Institute, National Naval Medical Center, Bethesda, Maryland, 20014
- Dov H. Pluznik, Department of Life Sciences, Bar-Ilan University, Ramat-Gan, Israel
- H. D. Preisler, M.D., Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- J. Renick, M.D., Departments of Medicine A and Grace Center Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- I. Rieder, Institut für Hämatologie der Gesellschaft für Strahlen- und Umweltforschung, München, 8 München 2, Landwehrstr. 61, West Germany
- H. Rodt, Abt. Immunologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- J. J. van Rood, Department of Immunohaematology, University Hospital Leiden, The Netherlands
- Jim Russell, Department of Biological Sciences, Purdue University, West Lafayette, Indiana
- Y. M. Rustum, M.D., Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- J. E. Sanders, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Department of Medicine, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- George W. Santos, M.D., Oncology Center, The Johns Hopkins University School of Medicine, Baltimore, Maryland, 21205
- E. Schäffer, Institut für Biologie der Gesellschaft für Strahlen- und Umweltforschung München, Abteilung für allgemeine und experimentelle Pathologie, 8042 Neuherberg, Ingolstädter Landstrasse 1, West Germany
- S. Scholz, Kinderpoliklinik der Universität München, 8 München 2, Pettenkoferstr., West Germany

- K. W. Sell, Naval Medical Research Institute, Bethesda, Maryland, 20014
- L. L. Sensenbrenner, Oncology Center, The Johns Hopkins University School of Medicine, Baltimore, Maryland, 21205
- S. J. Sharkis, Oncology Center, The Johns Hopkins University School of Medicine, Baltimore, Maryland, 21205
- J. Singer, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- B. Speck, Division of Hematology, Department of Internal Medicine, Kantonsspital Basel and Transplantation Immunology Unit, Hôpital Cantonal, Geneva, Switzerland
- D. A. Stewart, Division of Immunology, Experimental Hematology Department, Armed Forces Radiobiology Research Institute, National Naval Medical Center, Bethesda, Maryland, 20014
- Gisela Stinner, Anecamp-Street 6 D-300 Hannover-72 West Germany
- R. Storb, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- A. Termijtelen, Department of Immunohaematology, University Hospital Leiden, The Netherlands
- E. Thiel, Abt. Immunologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- S. Thierfelder, Abt. Immunologie des Institutes für Hämatologie, Landwehrstr. 61, 8000 München, West Germany
- E. D. Thomas, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- J. Torhorst, Research Laboratories, Dept. of Surgery and Dept. of Pathology, University of Basel, Switzerland
- Frank E. Trobaugh, Jr., Section of Hematology, Department of Medicine, Rush-Presbyterian-St. Luke's Medical Center, Chicago, Illinois, 60612
- Robert L. Truitt, Ph.D., May and Sigmund Winter Research Laboratory, Mount Sinai Medical Center, Milwaukee, Wisconsin, 53233
- J. L. Virelizier, Groupe de recherches d'Immunologie et de Rhumatologie Pédiatriques, Unité INSERM U 132, Pr. P. Mozziconacci, Hôpital des Enfants Malades, 75015, Paris, France
- H. M. Vriesendorp, Radiobiological Institute GONTO, Rijswijk, The Netherlands
- Dick van Waarde, Department of Infectious Diseases, University Hospital, Leiden, The Netherlands
- I. Walczak, Departments of Medicine A and Grace Cancer Drug Center, Roswell Park Memorial Institute, Buffalo, New York, 14263
- W. Weber, Division of Hematology, Department of Internal Medicine, Kantonsspital Basel and Transplantation Immunology Unit, Hôpital Cantonal, Geneva, Switzerland
- P. L. Weiden, Fred Hutchinson Cancer Research Center, Seattle, Washington, 98104, and the Departments of Medicine and Pediatrics, Division of Oncology, University of Washington School of Medicine, Seattle, Washington, 98195
- D. L. Westbroek, Laboratory for Experimental Surgery, Erasmus University, Rotterdam, The Netherlands
- E. G. Wright, Paterson Laboratories, Christie Hospital and Holt Radium Institute, Withington, Manchester, England
- G. F. Wündisch, Kinderklinik Schwabing der Techn. Universität München, West Germany

Part I**Regulation of Stem
Cell Proliferation**

L. G. Lajtha

1

**1 Regulation of Stem
Cell Proliferation**

3

L. G. Lajtha and E. G. Wright

Introduction

3

Experimental Evidence

3

Summary

7

References

7

**2 Surface Antigens of Hemopoietic
Stem Cells: The Expression of BAS,
Thy-1, and H-2 Antigens on CFU-s**

9

Ger van den Engh, Jim Russell, and

Diane de Cicco

Introduction

9

Materials and Methods

10

Results

11

Discussion

13

Summary

14

Acknowledgments

14

References

15

**3 The Regulation of Hemopoiesis:
Effect of Thymosin or Thymocytes
in a Diffusion Chamber**

17

S. J. Sharkis, A. Ahmed,

L. L. Sensenbrenner, W. W. Jedrzejczak,

A. L. Goldstein, and K. W. Sell

Introduction

17

Materials and Methods

17

Results

18

Discussion

20

Summary

21

Acknowledgments

21

References

21

**4 Anti-CFU-s Activity of Rabbit Anti-
mouse Brain Serum: Mechanism of
Action**

23

Solomon S. Adler, Richard D. Kuznetsky,
and Frank E. Trobaugh, Jr.

Introduction

23

Materials and Methods

23

Results

26

Discussion

29

Summary

31

Acknowledgments

31

References

31

Contents

Part II**Physiology of Committed Stem Cells**

D. Metcalf

- 5 The Control of Neutrophil and Macrophage Production at the Progenitor Cell Level 35

D. Metcalf

- Introduction 35
Granulocyte-macrophage Colony-forming Cells 35

- Control by GM-colony-stimulating Factor (GM-CSF) 39

- Nature and Sources of GM-CSF 39

- Role of Macrophages and Lymphocytes 41

- GM-CSF and Myeloid Leukemia 43

- General Comment 43

- Summary 44

- Acknowledgment 44

- References 44

- 6 The Mononuclear Phagocyte and Its Regulatory Interactions in Hemopoiesis 47

Jeffrey I. Kurland

- Introduction 47

- Dualism between CSF and Synthetic Prostaglandins 47

- Cyclic 3',5-Adenosine Monophosphate in the Mediation of PGE Activity 49

- Regulation of Granulopoiesis and Macrophage Production by Macrophage-derived PGE 49

- The Regulatory Role of Macrophages in Lymphopoiesis 55

- The Macrophage and Other Hemopoietic Cells 57

- Summary 58

- References 59

- 7 Analysis of the Cells Forming Pure and Mixed Erythroid Colonies in Agar after Stimulation by Pokeweed Mitogen-stimulated, Spleen-conditioned Medium 61

G. R. Johnson and D. Metcalf

- Introduction 61

- Materials and Methods 61

- Results 62

- Discussion 63

- Summary 63

- Acknowledgment 64

- References 64

- 8 Current Studies on the Proliferation of Cells of the Mononuclear Phagocyte System 65

Ralph van Furth, Theo J.L.M. Goud, and Dick van Waarde

- Introduction 65

- Origin and Kinetics of Mononuclear Phagocytes 65

- Regulation of Monocyte Production 67

- In Vitro* Proliferations of Bone Marrow Mononuclear Phagocytes 67

- Summary 70

- Acknowledgment 70

- References 70

- 9 Colony-forming Cells in the Thymus and Mesenteric Lymph Nodes of Mice Engrafted with Lewis Lung Carcinoma Cells 73

G. D. Ledney, T. J. MacVittie,

D. A. Stewart, and G. A. Parker

- Introduction 73

- Materials and Methods 74

- Results 75

- Discussion 79

- Summary 82

- Acknowledgment 83

- References 83

Part III**Transplantation Immunology**

S. Thierfelder 85

- 10 Expression of Normal and Leukemia-associated Antigens on Blood Cell Malignancies 87

S. Thierfelder, H. Rodt, E. Thiel, B. Netzel,

G. Jäger, G. Hoffmann-Fezer, D. Huhn,

P. Dörmer, R. J. Haas, G. F. Wündisch,

Ch. Bender Götze, and B. Lau

- Introduction 87

- Materials and Methods 87

- Results and Conclusions 88

- Summary 97

- Acknowledgment 98

- References 98

- 11 Leukocyte Transfusions for the Modification of Host-versus-graft Reactions in Dogs 101

I. Rieder, H. J. Kolb, E. Schaffer,

H. Kolb, H. Gross-Wilde, S. Scholz,

and S. Thierfelder

- Introduction 101

- Materials and Methods 101

- Results 102

- Discussion 104

- Summary 106

- Acknowledgment 106

- References 106

12	Minor Histocompatibility Systems in Dogs	109	Immunization Procedures	134
	H. M. Vriesendorp, A. B. Bijnen, A. C. M. Van Kessel, H. Obertop, and D. L. Westbroek		X-irradiation	135
	Introduction	109	Statistical Analysis	135
	Materials and Methods	110	Experimental Design	135
	Results	110	Results	135
	Discussion	114	Discussion	138
	Acknowledgments	115	Summary	139
	Summary	115	Acknowledgments	139
	References	116	References	139
13	The Role of Mononuclear Phagocytes in the Defense against Infections and Malignancies	119		
	A. Cruchaud		Part IV	
	Introduction	119	Therapeutic Approaches to Aplastic Anemia	141
	Macrophages and the Immune Response	119	B. Speck	
	Effects of the Humoral Immune Response on Macrophage Functions	120	16 On the Pathogenesis and Treatment of Aplastic Anemia	143
	Effects of the Cell-mediated Immune Response on Macrophage Functions	120	B. Speck, P. Cornu, C. Nissen, P. Groff, W. Weber, and M. Jeannet	
	Microbiocidal Mechanisms of Macrophages	121	Introduction	143
	Role of Macrophages in the Defense against Neoplastic Disease	122	Materials and Methods	143
	Summary	122	Results	144
	Acknowledgment	123	Discussion	146
	References	123	Summary	148
14	Enhancement of Immunological Responses by Methotrexate Pre-treatment as a Result of an Eventual Elimination of Suppressor Cells	127	Acknowledgments	148
	S. Orbach-Arbouys, M. Castes, and B. M. Berardet		References	148
	Introduction	127	17 Engraftment of HLA Identical Marrow in Treatment of Severe Aplastic Anemia: Results of 110 Consecutive Transplants	151
	Materials and Methods	127	R. Storb, E. D. Thomas, P. L. Weiden, C. D. Buckner, R. A. Clift, A. Fefer, B. W. Goodell, F. L. Johnson, P. E. Neiman, J. E. Sanders, and J. Singer	
	Results	128	Introduction	151
	Discussion	129	Materials and Methods	151
	Summary	130	Results	152
	Acknowledgment	130	Discussion	153
	References	130	Summary	154
15	Syngeneic and Autologous Bone Marrow Transplantation after Noncurative Chemotherapy with AAFC, DMM, and Cyclophosphamide in Tumor-bearing Mice	133	Acknowledgment	155
	Gisela Stinner, J. Torhorst, and G. L. Floersheim		References	155
	Introduction	133	18 The Role of Cyclophosphamide and Total-body Irradiation in Marrow Transplantation for Severe Aplastic Anemia	157
	Materials and Methods	134	Robert Peter Gale for the UCLA Bone Marrow Transplant Team	
	Preparation of Cel Inocula	134	Introduction	157
	Treatment of Bone Marrow Cells with Anti-Thy 1.2 Serum plus Complement	134	Materials and Methods	158
			Results	159
			Discussion	160
			Summary	161
			Acknowledgments	161
			References	161

19	Histocompatibility Testing for Bone-marrow Grafting	163	George W. Santos and Saul J. Sharkis		
M. Jeannet and B. Speck			Introduction	187	
Introduction	163		Materials and Methods	187	
The Selection of an HLA-compatible Donor	163		Results	188	
Detection of Prior Sensitization	165		Discussion	189	
Summary	168		Summary	189	
Acknowledgments	168		Acknowledgment	190	
References	168		References	190	
20	Recent Developments in Histocompatibility Testing in Bone Marrow Transplantation	171	23	Marrow Transplantation for Acute Leukemia	191
J. J. van Rood, A. van Leeuwen, E. Goulmy, A. Munroe, A., Termijtelen, and B. A. Bradley			C. D. Buckner, R. A. Clift, A. Fefer, P. E. Neiman, J. E. Sanders, R. Storb, P. L. Weiden, E. D. Thomas, and the Seattle Marrow Transplant Team		
Introduction	171		Summary	194	
What Progress Has Been Made in Recognizing Non-HLA Antigens?	171		Acknowledgment	194	
Platelet Antigens	172		References	194	
H-Y Immunity	172				
Can HLA-Identical Unrelated Donors Be Used in Bone Marrow Transplantation?	173		24	Use of Decontamination and a Protected Environment to Prevent Secondary Disease following Adoptive Immunotherapy of Acute Leukemia in Mice	195
The Influence of Sensitization on the Effectiveness of Immunosuppression	175		Robert L. Truitt		
Summary	175		Introduction	195	
Acknowledgment	176		Materials and Methods	196	
References	176		Results	197	
			Conclusions	199	
			Summary	200	
			Acknowledgments	200	
			References	201	
21	Transplantation of Lymphoid Cells in Patients with Severe Combined Immunodeficiency (SCID)	179	25	Procurement of Proliferative and Quiescent Acute Leukemia Cells by Centrifugal Elutriation	203
C. Griscelli, A. Durandy, J. J. Ballet, J. L. Virelizier, and F. Daguillard			H. D. Preisler, G. Hausner, I. Walczak, S. Bruno, V. Von Flidner, G. Christoff, Y. M. Rustum, and J. Renick		
Introduction	179		Introduction	203	
Characteristics of Patients with SCID	179		Methods	203	
Grafting of Fetal Tissue	180		Results	204	
Grafting of Bone Marrow Tissue	180		Discussion	206	
Immunological Dysregulation Associated with Mild GvHD	181		Summary	209	
Defects of Precursor T-cells in SCID with B-lymphocytes	182		Acknowledgment	209	
Conclusion	182		References	209	
Summary	183				
Acknowledgment	183				
References	183				
Part V			Part VI		
Treatment of Leukemia	185		Advances in Experimental Hematology	211	
George W. Santos			D. H. Pluznik		
22	Experience with Syngeneic Marrow Transplantation in Brown-Norway and Wistar-Furth Rat Models of Acute Myelogenous Leukemia	187	26	Cellular Requirements for Induction of Colony-stimulating Factor in Lymphoid Cell Cultures Stimulated by T- and B-Cell Mitogens	213

Ron N. Apte, Eliahu Heller, Chanita F. Hertogs, and Dov H. Pluznik		28 Ultrastructural Analysis of Preserved Dog Granulocytes	231
Introduction	213	J. E. French, M. P. Grissom, J. F. Jemionek, T. J. Contreras, and W. J. Flor	
Materials and Methods	214	Introduction	231
Results	214	Materials and Methods	231
Discussion	217	Results	232
Summary	219	Discussion	239
Acknowledgments	219	Summary	241
References	219	Acknowledgment	241
		References	241
27 Serum Blocking Factor-mediated Decrease of T-Cell Immunity Induced by Soluble Histo- compatibility Antigens (SHA); Similar Effects of Antibody-free SHA-raised and Hemagglutinating- enhancing Sera	221	29 Relationship between Colony-forming Cells in Diffusion Chambers <i>in Vivo</i> (CFU-d) and Colony-forming Cells in Agar <i>in Vitro</i> (CFU-c): Physical Separation and Kinetics in Culture	243
O. Halle-Pannenko, L. Berumen, N. Abuaf, and G. Mathe		Niels Jacobsen, Hal E. Broxmeyer, and M. A. S. Moore	
Introduction	221	Introduction	243
Materials and Methods	221	Materials and Methods	243
Results	222	Results	245
Humoral Immunity of Mice Treated with SHA	224	Discussion	247
Discussion	226	Summary	248
Summary	228	Acknowledgments	249
Acknowledgment	229	References	249
References	229	<i>Index</i>	251

PART I

Regulation of Stem Cell Proliferation

L. G. Lajtha

