



# ANNUAL REVIEW OF IMMUNOLOGY

---

VOLUME 18, 2000

WILLIAM E. PAUL, *Editor*  
National Institutes of Health, Bethesda, Maryland

C. GARRISON FATHMAN, *Associate Editor*  
Stanford University, Stanford, California

LAURIE H. GLIMCHER, *Associate Editor*  
Harvard University School of Public Health

[www.AnnualReviews.org](http://www.AnnualReviews.org)    [science@annurev.org](mailto:science@annurev.org)    650-493-4400

ANNUAL REVIEWS

4139 El Camino Way • P.O. Box 10139 • Palo Alto, California 94303-0139

# CONTENTS

---

DISCOVERING THE ROLE OF THE MAJOR HISTOCOMPATIBILITY COMPLEX IN THE IMMUNE RESPONSE, <i>Hugh O. McDevitt</i>	1
RECEPTOR SELECTION IN B AND T LYMPHOCYTES, <i>David Nemazee</i>	19
MOLECULAR BASIS OF CELIAC DISEASE, <i>Ludwig M. Sollid</i>	53
POPULATION BIOLOGY OF LYMPHOCYTES: THE FLIGHT FOR SURVIVAL, <i>Antonio A. Freitas and Benedita Rocha</i>	83
NONCLASSICAL MHC CLASS II MOLECULES, <i>Christopher Alfonso and Lars Karlsson</i>	113
NEGATIVE REGULATION OF CYTOKINE SIGNALING PATHWAYS, <i>Hideo Yasukawa, Atsuo Sasaki, and Akihiko Yoshimura</i>	143
T CELL ACTIVATION AND THE CYTOSKELETON, <i>Oreste Acuto and Doreen Cantrell</i>	165
THE SPECIFIC REGULATION OF IMMUNE RESPONSES BY CD8 <sup>+</sup> T CELLS RESTRICTED BY THE MHC CLASS IB MOLECULE, QA-1, <i>Hong Jiang and Leonard Chess</i>	185
THE BIOLOGY OF CHEMOKINES AND THEIR RECEPTORS, <i>Devora Rossi and Albert Zlotnik</i>	217
DENDRITIC CELLS IN CANCER IMMUNOTHERAPY, <i>Lawrence Fong and Edgar G. Engleman</i>	245
CD8 <sup>+</sup> T CELL EFFECTOR MECHANISMS IN RESISTANCE TO INFECTION, <i>John T. Harty, Amy R. Tinnereim, and Douglas W. White</i>	275
GLUCOCORTICOIDS IN T CELL DEVELOPMENT AND FUNCTION, <i>Jonathan D. Ashwell, Frank W. M. Lu, and Melanie S. Vacchio</i>	309
MOLECULAR GENETICS OF ALLERGIC DISEASES, <i>Santa Jeremy Ono</i>	347
IMMUNOLOGY AT THE MATERNAL-FETAL INTERFACE: LESSONS FOR T CELL TOLERANCE AND SUPPRESSION, <i>A. L. Mellor and D. H. Munn</i>	367
REGULATION OF B LYMPHOCYTE RESPONSES TO FOREIGN AND SELF-ANTIGENS BY THE CD19/CD21 COMPLEX, <i>Douglas T. Fearon and Michael C. Carroll</i>	393
REGULATORY T CELLS IN AUTOIMMUNITY, <i>Ethan M. Shevach</i>	423
SIGNALING AND TRANSCRIPTION IN T HELPER DEVELOPMENT, <i>Kenneth M. Murphy, Wenjun Ouyang, J. David Farrar, Jianfei Yang, Sheila Ranganath, Helene Asnagli, Maryam Afkarian, and Theresa L. Murphy</i>	451

THE RAG PROTEINS AND V(D)J RECOMBINATION: COMPLEXES, ENDS, AND TRANSPOSITION, <i>Sebastian D. Fugmann, Alfred Ian Lee, Penny E. Shockett, Isabelle J. Villey, and David G. Schatz</i>	495
THE ROLE OF THE THYMUS IN IMMUNE RECONSTITUTION IN AGING, BONE MARROW TRANSPLANTATION, AND HIV-1 INFECTION, <i>Barton F. Haynes, M. Louise Markert, Gregory D. Sempowski, Dhavalkumar D. Patel, and Laura P. Hale</i>	529
ACCESSING COMPLEXITY: THE DYNAMICS OF VIRUS-SPECIFIC T CELL RESPONSES, <i>Peter C. Doherty and Jan P. Christensen</i>	561
THE ROLE OF CHEMOKINE RECEPTORS IN PRIMARY, EFFECTOR, AND MEMORY IMMUNE RESPONSES, <i>Federica Sallusto, Charles R. Mackay, and Antonio Lanzavecchia</i>	593
PHOSPHORYLATION MEETS UBIQUITINATION: THE CONTROL OF NF- $\kappa$ B ACTIVITY, <i>Michael Karin and Yinon Ben-Neriah</i>	621
RESERVOIRS FOR HIV-1: MECHANISMS FOR VIRAL PERSISTENCE IN THE PRESENCE OF ANTIVIRAL IMMUNE RESPONSES AND ANTIRETROVIRAL THERAPY, <i>Theodore Pierson, Justin McArthur, and Robert F. Siliciano</i>	665
REGULATION OF ANTIBODY RESPONSES VIA ANTIBODIES, COMPLEMENT, AND FC RECEPTORS, <i>Birgitta Heyman</i>	709
MULTIPLE ROLES FOR THE MAJOR HISTOCOMPATIBILITY COMPLEX CLASS I-RELATED RECEPTOR, FC $\gamma$ Rn, <i>Victor Ghetie and E. Sally Ward</i>	739
IMMUNOBIOLOGY OF DENDRITIC CELLS, <i>Jacques Banchereau, Francine Brière, Christophe Caux, Jean Davoust, Serge Lebecque, Yong-Jun Liu, Bali Pulendran, and Karolina Palucka</i>	767
AN ADDRESS SYSTEM IN THE VASCULATURE OF NORMAL TISSUES AND TUMORS, <i>E. Ruoslahti and D. Rajotte</i>	813
GENOMIC VIEWS OF THE IMMUNE SYSTEM, <i>Louis M. Staudt and Patrick O. Brown</i>	829
VIRAL SUBVERSION OF THE IMMUNE SYSTEM, <i>Domenico Tortorella, Benjamin E. Gewurz, Margo H. Furman, Danny J. Schust, and Hidde L. Ploegh</i>	861
DNA VACCINES: IMMUNOLOGY, APPLICATION, AND OPTIMIZATION, <i>Sanjay Gurunathan, Dennis M. Klinman, and Robert A. Seder</i>	927
$\gamma\delta$ CELLS: A RIGHT TIME AND A RIGHT PLACE FOR A CONVERGED THIRD WAY OF PROTECTION, <i>Adrian C. Hayday</i>	975

## INDEXES

Subject Index	1027
Cumulative Index of Contributing Authors, Volumes 1-18	1073
Cumulative Index of Chapter Titles, Volumes 1-18	1083