

Contents

Fundamental Principles

The Immune System	1		
Origin of Cells of the Immune System		Monocytes and Dendritic Cells	
Overview	2	The Phagocyte System	40
Organs of the Lymphatic System		Monocyte Function and Antigens	42
Overview	4	Dendritic Cell Populations	44
Thymus	6	DC Maturation: Changes in Phenotype and Fuction	46
Peripheral Organs	8	HLA System (MHC System)	
T-Lymphocyte Development and Differentiation		Genomic Organization of the HLA Complex	48
T Cell Development	10	HLA Molecule Structure and Class I Alleles	50
T-Cell Selection	12	HLA Molecules: Class II Alleles (II)	52
T-Cell Receptors	14	MHC Class II-dependent Antigen Presentation ..	54
T-Cell Antigens	16	MHC Class I-dependent Antigen Presentation ..	56
T-Cell Activation	18	The Complement System	
T _H 1 and T _H 2 Cells	20	Activation and Effectors	58
B-Lymphocyte Development and Differentiation		Regulation and Effects	60
B-Cell Ontogenesis	22	Innate Immunity	
Germinal Center Reaction	24	Pathogen-associated Molecular Patterns	62
Immunoglobulins	26	Leukocyte Migration	
Immunoglobulin Classes	28	Leukocyte Adhesion and Migration	64
Immunoglobulin Gene Organization	30	Pathological Immune Mechanisms and Tolerance	
Immunoglobulin Gene Product Expression	32	Hypersensitivity Reactions	66
Important B-Cell Antigens	34	Induction and Preservation of Tolerance	68
Cell-Cell Interactions		Mechanisms of Autoimmunity (I)	70
Interactions between T Cells and Antigen-presenting Cells	36	Mechanisms of Autoimmunity (II)	72
Nonspecific Defense Cells		Apoptosis	
Natural Killer Cells	38	Apoptosis	74

Laboratory Applications

Antigen-Antibody Interactions		Cellular Immunity	
Definitions and Precipitation Techniques	76	Cell Isolation Techniques	88
Techniques of Electrophoresis	78	Tests of T-Cell Function	90
Agglutination Techniques/Complement- binding Reaction	80	Antigen-specific Tests	92
ELISA, RIA, and Immunoblotting	82	Assay Procedures for Characterizing Antigen-specific T Cells	94
Immunofluorescence	84	Humoral Immunity	
Immunohistology	86	Tests of B-Cell Function	96
		Molecular Biological Methods	
		Analytical Techniques	98

Clinical Immunology

Immunodeficiencies

Humoral Immunodeficiencies 100
 Cellular Immunodeficiencies 102
 Granulocytic Deficiencies 104
 Complement Deficiencies and Defects 106
 HIV Structure and Replication 108
 Course of HIV Infection 110
 Diagnosis and Treatment of HIV Infection 112

Hemolytic Diseases and Cytopenias

ABO Blood Group System 114
 Rhesus and Other Blood Group Systems 116
 Mechanisms of Hemolysis
 and Antibody Detection 118
 Autoimmune Hemolysis Due to
 Warm Antibodies 120
 Autoimmune Hemolysis Due to
 Cold Antibodies 122
 Drug-induced Hemolysis
 and Transfusion Reactions 124
 Autoimmune Neutropenias and
 Other Cytopenias 126

Hematological Diseases

Acute Leukemias 128
 Overview of Lymphoma Classifications 130
 Hodgkin's Disease 132
 T-Cell Lymphomas 134
 B-Cell Lymphomas 138
 Plasma Cell Dyscrasias 142
 Multiple Myeloma 144
 Cryoglobulinemia 146
 Amyloidosis 148

Tumor Immunology

Detection and Identification
 of Tumor Antigens 150
 Immune Escape Mechanisms of Tumor
 Antigens 152
 Immunotherapeutic Strategies (I) 154
 Immunotherapeutic Strategies (II) 156

Transplantation of Autologous

Bone Marrow/Hematopoietic Stem Cells 158
 Transplantation of Allogenic
 Bone Marrow/Hematopoietic Stem Cells 160
 Clinical Aspects of Organ Transplantation 162
 Immunological Aspects of Organ
 Transplantation 164

Musculoskeletal Diseases

Clinical Features of Rheumatoid Arthritis 166
 Synovial Changes in Rheumatoid Arthritis 168

Pathogenesis of Rheumatoid Arthritis (I) 170
 Pathogenesis of Rheumatoid Arthritis (II) 172
 Juvenile Chronic Arthritis 174
 Clinical Features of Spondylarthritis 176
 Pathogenesis of Spondylarthritis 178
 Gout, Polychondritis and Behçet's Syndrome .. 180

Autoantibodies

Autoantibody Patterns 182

**Connective Tissue Disease
 and Vasculitis**

Clinical Features of SLE 184
 Pathogenesis of SLE 186
 Scleroderma and Mixed Connective
 Tissue Disease 188
 Sjögren's Syndrome 190
 Myositic Diseases 192
 General Classification of Vasculitis 194
 Immune Vasculitides
 and Polyarteritis Nodosa 196
 Giant Cell Arteritis 198

Skin Diseases

Urticaria 200
 Contact Allergies 202
 Atopic Dermatitis
 and Leukocytoclastic Vasculitis 204
 Psoriasis and Bullous Skin Diseases 206

Gastrointestinal Diseases

Atrophic Gastritis, Whipple's Disease
 and Sprue 208
 Chronic Inflammatory Bowel Diseases 210
 Autoimmune Liver Diseases 212

Respiratory Diseases

Bronchial Asthma and Allergic Rhinitis 214
 Sarcoidosis and Idiopathic
 Pulmonary Fibrosis 216
 Extrinsic Allergic Alveolitis 218
 Tuberculosis 220

Renal Diseases

Immunological Mechanisms 222
 Glomerulonephritis (I) 224
 Glomerulonephritis (II) and
 Interstitial Nephritis 226

Metabolic Diseases

Autoimmune Thyroid Diseases 228
 Diabetes Mellitus and
 Autoimmune Polyglandular Syndrome 230

Heart Disease

Rheumatic Fever, Myocarditis,
and Postinfarction Syndrome 232

Neurological Diseases

Multiple Sclerosis 234
Autoantibody-mediated Diseases 236
Myasthenia Gravis and
Lambert–Eaton Syndrome 238

Ophthalmic Diseases

Anatomy and Pathogenesis 240
Extraocular Inflammations 242
Uveitis (I) 244
Uveitis (II) and Ocular Manifestations
of Systemic Disease 246

Reproduction Immunology

Reproduction Immunology 248

Vaccinations

Overview 250
New Vaccines 252

Immune Pharmacology

Nonsteroidal Anti-inflammatory Drugs
and Glucocorticoids 254
Antimetabolites, Cyclophosphamide,
Sulfasalazine, and Gold 256
Cyclosporin A, Mycophenolate,
and Leflunomide 258
Monoclonal and Polyclonal Antibodies 260

Appendix

Tables 262
Glossary 300

Further Reading 306
Index 308