

# Contents

|          |                                                                                                                   |           |
|----------|-------------------------------------------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>Discovery</b>                                                                                                  | <b>1</b>  |
|          | The Germ Theory of Disease                                                                                        | 1         |
|          | Ehrlich's Side Chain Theory                                                                                       | 1         |
|          | Horror Autotoxicus                                                                                                | 1         |
|          | Discovery of Autoimmune Disease                                                                                   | 2         |
|          | Classification of Adverse Immune Reactions                                                                        | 2         |
|          | Synopsis of the Immunity System                                                                                   | 3         |
|          | Therapy and Prophylaxis for the Infectious Diseases                                                               | 3         |
|          | Autoimmune Disease. Steps in Discovery of its Existence,<br>Pathogenesis, Genetics, Immunotherapy and Prophylaxis | 4         |
|          | A Plague of Goitre in New Zealand                                                                                 | 4         |
|          | Kelly and Sneddon Discover Why Iodine Deficiency Occurs                                                           | 5         |
|          | Hercus, Purves and Goitre in New Zealand                                                                          | 6         |
|          | Discovery of Antithyroid Drugs                                                                                    | 7         |
|          | Solution of Pituitary Gland Cytology                                                                              | 8         |
|          | Adams' Entry into the Research World                                                                              | 9         |
|          | Graves' Disease                                                                                                   | 10        |
|          | Radioactive Iodine                                                                                                | 11        |
|          | Thyroid Research with Radioactive Iodine                                                                          | 11        |
|          | Discovery of Long-Acting Thyroid Stimulator                                                                       | 12        |
|          | LATS Protector                                                                                                    | 16        |
|          | A Letter from Deborah Doniach                                                                                     | 16        |
|          | LATS Protector, the Specific Human Thyroid Stimulator                                                             | 16        |
|          | Exophthalmos                                                                                                      | 18        |
|          | Neonatal Thyrotoxicosis                                                                                           | 18        |
|          | References                                                                                                        | 18        |
| <b>2</b> | <b>Pathogenesis</b>                                                                                               | <b>21</b> |
|          | Immune Tolerance                                                                                                  | 21        |
|          | Nossal's Key Experiment                                                                                           | 21        |
|          | Discovery of the Structure of Antibody Molecules                                                                  | 22        |

|                                                                                                |           |
|------------------------------------------------------------------------------------------------|-----------|
| Discovery of T and B Lymphocytes . . . . .                                                     | 23        |
| Types of T Lymphocytes (T Cells) . . . . .                                                     | 24        |
| Regulation of Immune Responses . . . . .                                                       | 25        |
| Suppressor T Cells as the Cause of the Autoimmune Diseases . . . .                             | 26        |
| Loss of Suppressor T Cells does not Cause<br>the Autoimmune Diseases . . . . .                 | 26        |
| Solution of the Pathogenesis of Autoimmune Disease . . . . .                                   | 26        |
| Jerne's Selection Theory of the Immune Response . . . . .                                      | 26        |
| The Immunological Clone . . . . .                                                              | 27        |
| Burnet's Clonal Selection Theory of the Immune Response . . . . .                              | 27        |
| Burnet's Forbidden Clone Theory of Autoimmune Disease . . . . .                                | 27        |
| Cytotoxic T Cell Forbidden Clones . . . . .                                                    | 28        |
| Graves' Disease, a Paradigm for Autoimmune Disease . . . . .                                   | 28        |
| Pathogenic Forbidden Clones; Discovered Ones<br>and Ones Awaiting Discovery . . . . .          | 30        |
| References . . . . .                                                                           | 30        |
| <b>3 Genetics . . . . .</b>                                                                    | <b>33</b> |
| The Familial Aggregation . . . . .                                                             | 33        |
| Discovery of the Histocompatibility System . . . . .                                           | 33        |
| The Major Histocompatibility Complex . . . . .                                                 | 34        |
| Involvement of the MHC in Autoimmune Disease . . . . .                                         | 34        |
| Functions of the Major Histocompatibility Complex . . . . .                                    | 34        |
| Benacerraf and McDevitt's Mistake . . . . .                                                    | 36        |
| Solution of the Genetics of Autoimmune Disease;<br>The H Gene Theory . . . . .                 | 36        |
| The H Gene Theory of Inheritance of Autoimmune Disease . . . . .                               | 37        |
| The Alternative Clonal Development Concept . . . . .                                           | 37        |
| Confirmation at the Molecular Level . . . . .                                                  | 37        |
| Immune Response Genes . . . . .                                                                | 38        |
| A Fourth Gene Category for McKusick's Catalogue . . . . .                                      | 38        |
| Schizophrenia . . . . .                                                                        | 38        |
| The Knight Model of Schizophrenia . . . . .                                                    | 39        |
| References . . . . .                                                                           | 40        |
| <b>4 Microbial Triggers . . . . .</b>                                                          | <b>43</b> |
| Information from Sequencing Antigens on Bacteria<br>that Trigger Autoimmune Diseases . . . . . | 44        |
| How Histocompatibility Antigens Predispose to<br>Autoimmune Diseases . . . . .                 | 45        |
| Four Laws of Autoimmunity . . . . .                                                            | 46        |
| References . . . . .                                                                           | 48        |

|                                                                                             |    |
|---------------------------------------------------------------------------------------------|----|
| <b>5 Immunotherapy</b> . . . . .                                                            | 49 |
| Generalised Immune Suppression . . . . .                                                    | 49 |
| Immune Ablation and Autologous Bone Marrow Cell Restoration. . . . .                        | 49 |
| Selective Destruction of Forbidden Clones . . . . .                                         | 50 |
| References . . . . .                                                                        | 51 |
| <b>6 Prophylaxis</b> . . . . .                                                              | 53 |
| Post-Measles Encephalomyelitis and Ender's Measles Vaccine . . . . .                        | 53 |
| The Poliomyelitis Epidemics. . . . .                                                        | 53 |
| Was the Paralysis a Rare Autoimmune Complication<br>of Universal Virus Infection? . . . . . | 54 |
| The Lead in Prophylaxis Given by the Polio Vaccines. . . . .                                | 54 |
| Finding Microbial Triggers. . . . .                                                         | 54 |
| Possible Therapy by Vaccination against Microbial Triggers . . . . .                        | 54 |
| References . . . . .                                                                        | 55 |
| <b>7 Transplantation</b> . . . . .                                                          | 57 |
| References . . . . .                                                                        | 57 |

Autoimmune Disease

Pathogenesis, Genetics, Immunotherapy, Prophylaxis  
and Principles for Organ Transplantation

Adams, D.D.; Adams, C.D.

2013, XIII, 58 p. 21 illus., 10 illus. in color., Softcover

ISBN: 978-94-007-6936-6