

## TABLE OF CONTENTS

|                                                                                                                                |            |
|--------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Chapter 1</b><br><b>Experimental Radiation and Immune Defense Interactions</b> .....                                        | <b>1</b>   |
| <b>Eva Lotzová</b>                                                                                                             |            |
| <b>Chapter 2</b><br><b>Host-Tumor Interactions and Methods of Evaluating Immunocompetence</b><br><b>in Humans</b> .....        | <b>21</b>  |
| <b>Kenneth J. McCormick</b>                                                                                                    |            |
| <b>Chapter 3</b><br><b>Immunocompetence in Head and Neck Cancer Patients Undergoing Radio-</b><br><b>therapy</b> .....         | <b>51</b>  |
| <b>Vernon K. Jenkins</b>                                                                                                       |            |
| <b>Chapter 4</b><br><b>Effect of Radiation of Immunology in Bronchogenic Carcinoma</b> .....                                   | <b>65</b>  |
| <b>Stefano S. Stefani, Donthamsetti S. Rao, and Julianne Soucek</b>                                                            |            |
| <b>Chapter 5</b><br><b>Radiotherapy and Immune Response in Malignant Lymphomas</b> .....                                       | <b>73</b>  |
| <b>Sameer Rafla and Shun-Jun Yang</b>                                                                                          |            |
| <b>Chapter 6</b><br><b>Leukemia: Whole Body Irradiation and Reconstitution</b> .....                                           | <b>93</b>  |
| <b>Eva Lotzová</b>                                                                                                             |            |
| <b>Chapter 7</b><br><b>Breast Cancer: Effect of Radiation Treatment on Immune Status</b> .....                                 | <b>113</b> |
| <b>Donald E. Carlson</b>                                                                                                       |            |
| <b>Chapter 8</b><br><b>Radiotherapy, Immunity, and Cervical Carcinoma</b> .....                                                | <b>121</b> |
| <b>David M. Mumford and Nancy McCormick</b>                                                                                    |            |
| <b>Chapter 9</b><br><b>Radiation Effect on Immunity in Cancer of the Genitourinary Tract</b> .....                             | <b>139</b> |
| <b>Donthamsetti S. Rao and Stefano S. Stefani</b>                                                                              |            |
| <b>Chapter 10</b><br><b>Clinical Use of Carcinoembryonic Antigen in the Management of</b><br><b>Patients with Cancer</b> ..... | <b>155</b> |
| <b>Paul H. Sugarbaker</b>                                                                                                      |            |
| <b>Chapter 11</b><br><b>Host Resistance and Response of Tumors to Ionizing Radiation</b> .....                                 | <b>175</b> |
| <b>Naresh Prasad and Luka Milas</b>                                                                                            |            |
| <b>Index</b> .....                                                                                                             | <b>193</b> |

## Chapter 1

EXPERIMENTAL RADIATION AND IMMUNE DEFENSE  
INTERACTIONS

Eva Lotzová



## TABLE OF CONTENTS

|      |                                                           |    |
|------|-----------------------------------------------------------|----|
| I.   | Introduction .....                                        | 2  |
| II.  | Complexity of the Immune System .....                     | 2  |
| III. | Immune System and Radiation .....                         | 4  |
| A.   | Lymphoid Tissues and Radiation .....                      | 4  |
| B.   | Antibody Response and Radiation .....                     | 7  |
| IV.  | Radiation and Various Subpopulations of Lymphocytes ..... | 9  |
| A.   | Macrophages .....                                         | 9  |
| B.   | Helper T Lymphocytes .....                                | 10 |
| C.   | Suppressor T Cells .....                                  | 11 |
| D.   | Effector T Cells .....                                    | 12 |
| E.   | Natural Killer (NK) Cells .....                           | 13 |
| F.   | B Cells .....                                             | 14 |
| V.   | Transplantation and Radiation .....                       | 14 |
| A.   | Solid Tissue Transplantation .....                        | 14 |
| B.   | Bone Marrow Transplantation .....                         | 14 |
| VI.  | Concluding Remarks .....                                  | 15 |
|      | References .....                                          | 15 |