Contents

1. Nature of Malignant Tumors, 3

Characteristics of Malignant Tumor Cells In Vivo, 3 Classification of Human Tumors, 7

2. Incidence, Epidemiology, and Etiology of Human Cancer, 27

Incidence and Survival Rates of the Most Common Cancers, 27 Geographical Distribution of Human Cancers, 32 Role of Various Factors in the Development of Cancer, 37

3. Regulation of Cellular Differentiation, 55

Genetic Regulation of Differentiation, 57
The Role of the Microenvironment in Differentiation, 59
Proliferation versus Differentiation, 61
Reversibility of Differentiation, 62
Control of Gene Expression during Differentiation, 64
Examples of Normal Differentiation, 84

4. Cellular Differentiation and Cancer, 99

Mouse Teratocarcinoma, 101 Myeloid Leukemia, 104 Erythroleukemia, 110 Neuroblastoma, 114 Differentiation in Other Malignant Neoplasms, 115 Conclusions, 116 VIII CONTENTS

5. Phenotypic Characteristics of Transformed Malignant Cells, 120

Cytological Characteristics of Transformed Cells. 123 Growth Characteristics of Transformed Cells, 124 Cell Surface Properties of Transformed Cells, 133 Enzyme Patterns in Cancer, 154 Proteases in Cancer, 161 Cyclic Nucleotides, 167 Growth Factors, 175 Oncodevelopmental Gene Products, 190 Production of Tumors in Experimental Animals, 191 Phenotype of Normal-Malignant Cell Hybrids, 192 Clonal Derivation of Cancer, 194

6. What is the Cause of the Phenotypic Derangement of the Cancer Cell?, 211

Genetic Mutation Induced by Chemicals or Irradiation, 212 Genetic Information Introduced into Cells by Oncogenic Viruses, 235 Chromosomal Alterations of Neoplastic Cells, 257 Gene Derepression in Cancer Cells, 265 Conclusions, 271

7. Tumor Growth In Vivo and Host-Tumor Interactions, 283

Characteristics of Tumor Growth In Vivo, 283 Tumor Effects on the Host, 295 Host Effects on the Tumor. 309

8. Some Future Prospects for Preventing and Curing Cancer, 323

Susceptibility to Cancer, 323 Chemoprevention, 325 Monoclonal Antibodies, 327 Biological Response Modifiers, 330 Modification of Tumor Cell Antigenicity, 335 Gene Therapy, 336

Index, 340