

Table of Contents

Preface		ix
1. Methods of Study		1
Preparation of Tissue for Microscopic Examination 1	Problems in the Interpretation of Tissue Sections 9	
Light Microscopy 3	Cryofracture 9	
Phase Contrast Microscopy 5	Radioautography 10	
Polarizing Microscopy 6	Examination of Living Cells & Tissues 13	
Electron Microscopy 6	The Isolation & Study in Vitro of Pure Cell Strains 14	
Scanning Electron Microscopy 9	Cell Fractionation 14	
2. Histochemistry & Cytochemistry		18
Basic Histochemical & Cytochemical Principles 18	Fluorescence Microscopy 24	
Some Examples of Histochemical Methods Used to Characterize & Localize Substances of Biologic & Medical Interest 18	Immunocytochemistry 24	
	In Situ Hybridization Techniques 26	
3. The Cell		28
Cellular Functions & Differentiation 28	The Nucleus 51	
Cell Components 28	Cell Division 59	
Microtubules, Microfilaments, & Intermediate Filaments 43	The Cell Cycle 60	
	Cell Dynamics 62	
4. Epithelial Tissue		64
General Characteristics of Epithelial Tissues 65	General Biology of Epithelial Tissues 77	
Specialization of the Apical Surfaces of Epithelia 71	Biology of the Main Types of Epithelial Cells 78	
Types of Epithelia 72	Epithelial Cell-Derived Tumors 89	
5. Connective Tissue		91
Ground Substance 91	Types of Connective Tissue 113	
Fibers 95	Histophysiology 119	
Cells 104		
6. Adipose Tissue		121
Unilocular Adipose Tissue 121	Multilocular Adipose Tissue 124	
	Tumors of Adipose Tissues 126	
7. Cartilage		127
Hyaline Cartilage 127	Fibrocartilage 133	
Elastic Cartilage 132	Intervertebral Disks 135	

8. Bone		136
Bone Cells 137	Growth & Remodeling of Bone 151	
Bone Matrix 141	Fracture Repair 153	
Periosteum & Endosteum 142	Histophysiology 154	
Types of Bone Tissue 143	Joints 156	
Histogenesis 145		
9. Nerve Tissue		160
Development of Nerve Tissue 160	Nerves 176	
Neurons 160	Autonomic Nervous System 176	
Perikaryon, or Soma 162	Histophysiology of Nerve Tissue 178	
Dendrites 164	Degeneration & Regeneration of Nerve Tissue 184	
Axons 164	Ganglia 187	
Synapses 166	Gray Matter & White Matter 189	
Neuroglia 168	Meninges 190	
Histophysiology of Neuroglia 172	The Choroid Plexus & the Cerebrospinal Fluid 191	
Nerve Fibers 172		
10. Muscle Tissue		194
Skeletal Muscle 194	Smooth Muscle 210	
Cardiac Muscle 206	Regeneration of Muscle Tissue 212	
11. Circulatory System		214
General Structure of Blood Vessels 214	Specific Structure of Blood Vessels 215	
	Tumors of Blood Vessels 228	
12. Blood Cells		229
Formed Elements of Blood 230		
13. Hematopoiesis		245
Bone Marrow 245	Maturation of Lymphocytes & Monocytes 255	
Maturation of Erythrocytes 247	Origin of Platelets 256	
Maturation of Granulocytes 250	Intrauterine Hematopoiesis 257	
Kinetics of Neutrophil Production 253		
14. Lymphoid System		260
The Immune System 260	Spleen 273	
Thymus 262	Unencapsulated Lymphoid Tissue 280	
Organ Transplantation 269	Tonsils 280	
Lymph Nodes 271		
15. Digestive Tract		282
General Structure of the Digestive Tract 282	Esophagus 290	
The Oral Cavity 284	Stomach 290	
1. The Tongue 284	Small Intestine 297	
2. The Pharynx 285	Large Intestine 306	
3. Teeth & Associated Structures 285	Appendix 309	
	Cancer of the Digestive Tract 310	
16. Glands Associated With the Digestive Tract		311
Salivary Glands 311	Histophysiology & Liver Function 328	
Pancreas 315	Biliary Tract 331	
Liver 316	Gallbladder 331	
	Tumors of the Digestive Glands 333	

17. Respiratory System		334
Nasal Cavity 339	Pulmonary Lymphatic Vessels 352	
Paranasal Sinuses 339	Nerves 352	
Nasopharynx 339	Pleura 352	
Larynx 340	Respiratory Movements 352	
Trachea 340	Defense Mechanisms of the Respiratory	
Bronchial Tree 341	System 352	
Pulmonary Blood Vessels 351	Tumors of the Lung 352	
18. Skin		354
Epidermis 354	Nails 365	
Dermis 361	Glands of the Skin 365	
Subcutaneous Tissue 362	Vessels & Nerves of the Skin 367	
Hairs 362	Tumors of the Skin 367	
19. Urinary System		368
Kidneys 368	Bladder & Urinary Passages 387	
Histophysiology of the Kidney 382		
20. Pituitary & Hypothalamus		390
Pituitary (Hypophysis) 390	Neurohypophysis 398	
Adenohypophysis 391	Tumors of the Pituitary 400	
21. Adrenals, Islets of Langerhans, Thyroid, Parathyroids, & Pineal Body		401
Adrenal (Suprarenal) Glands 401	Parathyroid Glands 416	
Islets of Langerhans 409	Pineal Body 419	
Thyroid 411		
22. The Male Reproductive System		422
Testis 422	Accessory Genital Glands 435	
Intratesticular Genital Ducts 433	Penis 436	
Excretory Genital Ducts 434	Tumors of the Male Reproductive	
	System 438	
23. The Female Reproductive System		439
Ovary 439	Vagina 458	
Uterine Tube (Oviduct) 446	External Genitalia 459	
Uterus 447	Endocrine Interrelationships 459	
Implantation 452	Exfoliative Cytology 459	
Placenta 454	Mammary Glands 461	
	Cancer of the Breast 465	
24. The Sense Organs		466
Receptors Related to Superficial & Deep	The Eye 470	
Sensation 467	Accessory Structures of the Eye 487	
The Proprioceptor System 467	The Ear, or Vestibulocochlear Apparatus 489	
The Chemoreceptor System 469		
Index		497