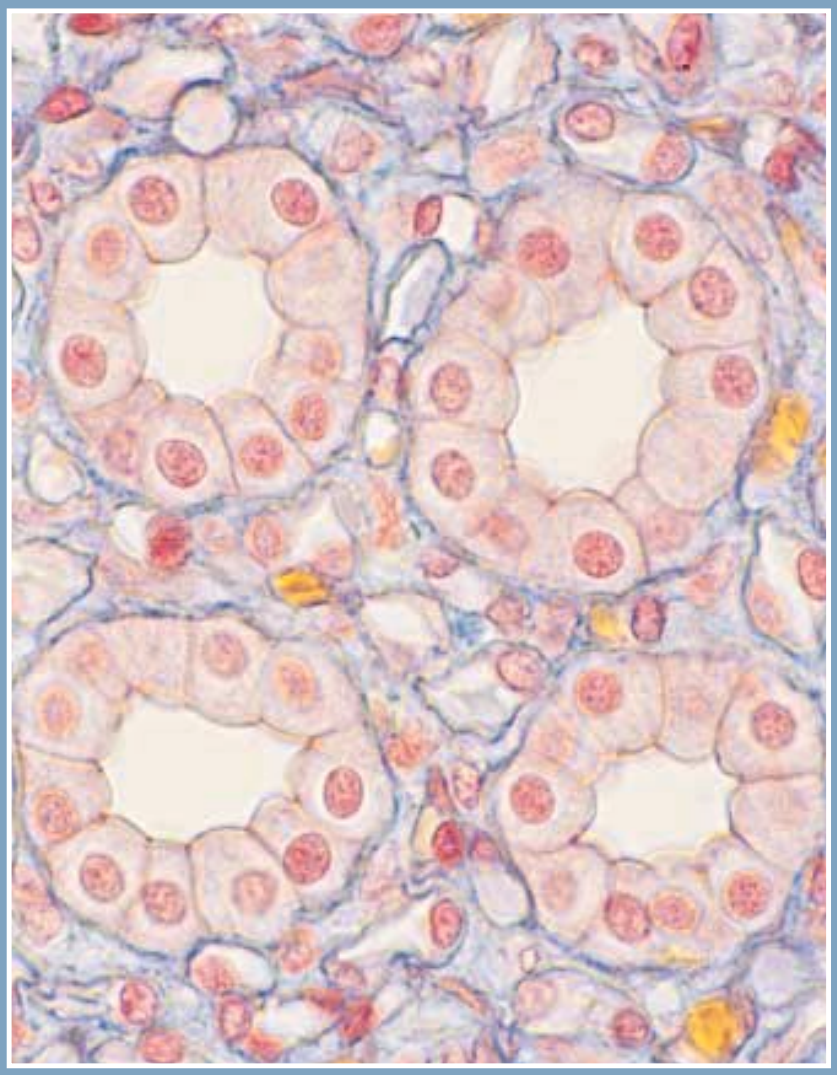
CHAPTER 1

Histology



Simple Cuboidal Epithelium

Figure 1-1
Interphase Nuclear membrane intact with chromatin visible. (×250)

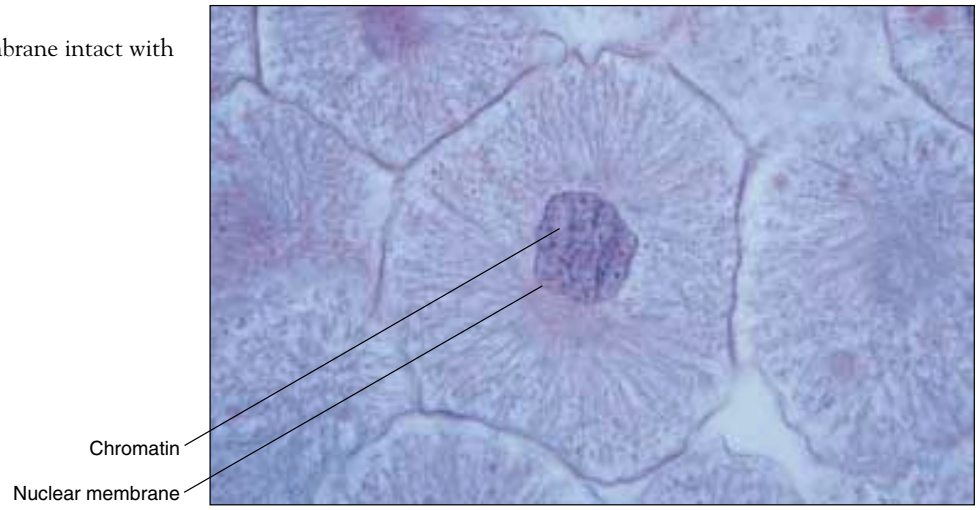


Figure 1-2
Prophase Duplicated chromosomes condensed into visible strands; nuclear membrane absent. (×250)

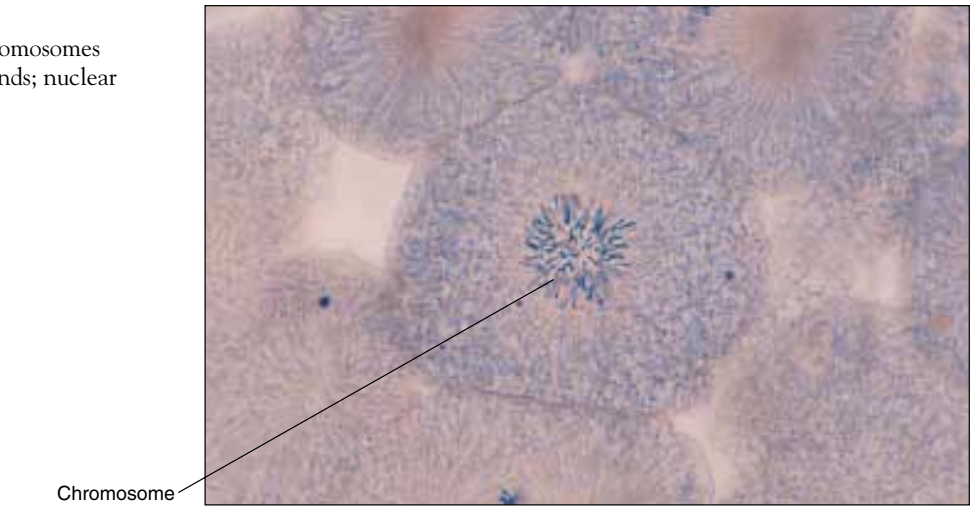
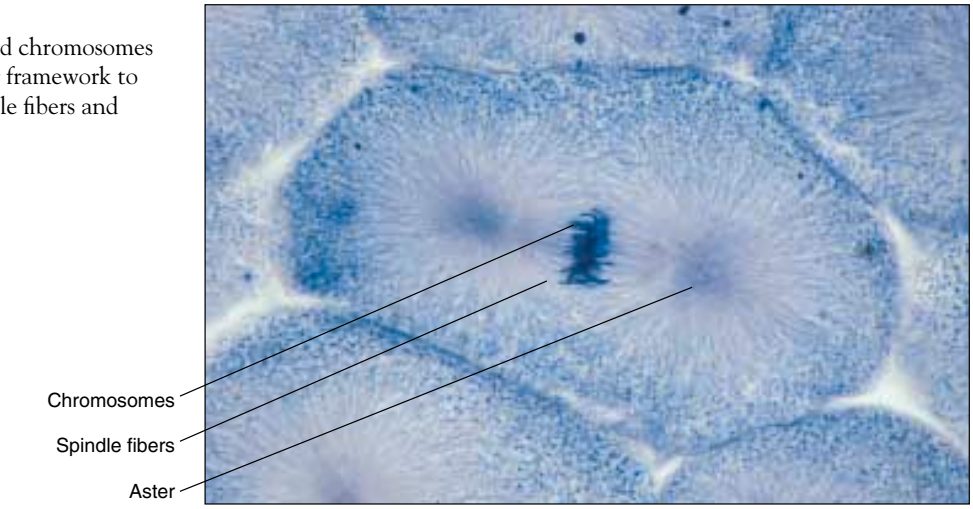


Figure 1-3
Metaphase Darkly stained chromosomes positioned by microtubular framework to align at cell equator. Spindle fibers and aster visible. (×250)



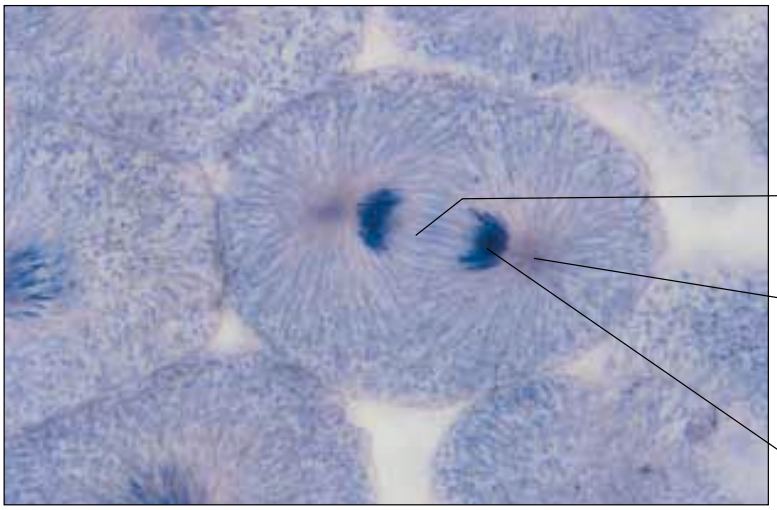


Figure 1-4
Anaphase Darkly stained chromosomes move to opposite poles under microtubular influence. Spindle fibers and aster visible. (×250)

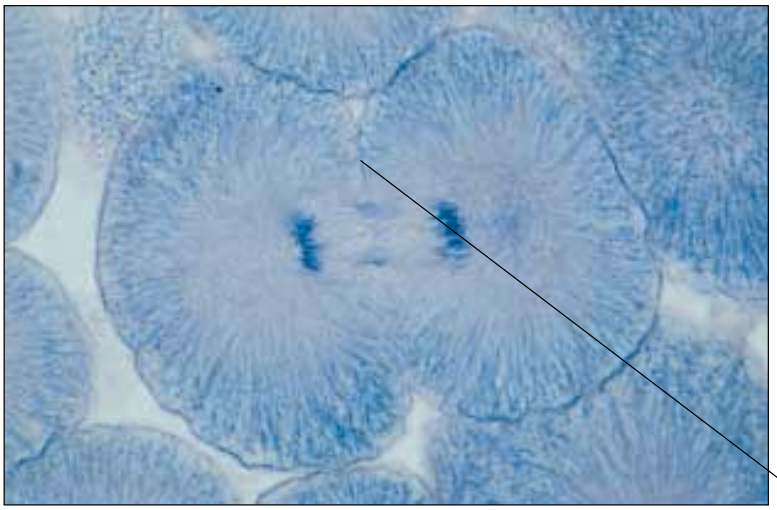


Figure 1-5
Telophase Separated chromosomes lose microtubular attachments. Belt of actinomyocin forms at equator, assists in formation of new cell membranes and cytokinesis. Cleavage furrow forms two daughter cells. (×250)

Figure 1-6
Simple Squamous Epithelium Single layer of flat cells covering a surface. From human omentum. (×250)

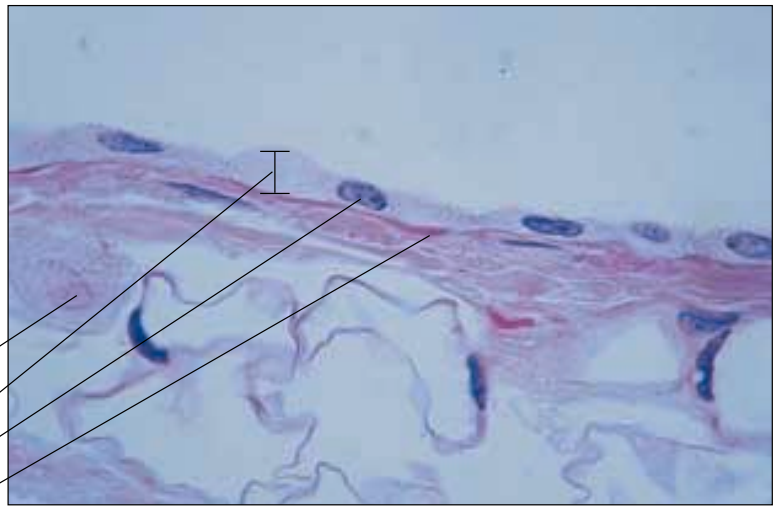


Figure 1-7
Simple Squamous Epithelium Surface view of flattened cells. Human mesothelium. (×250)

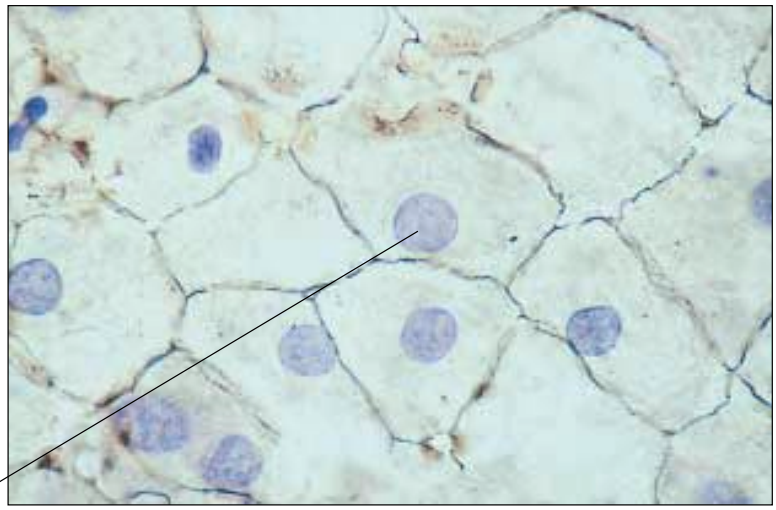
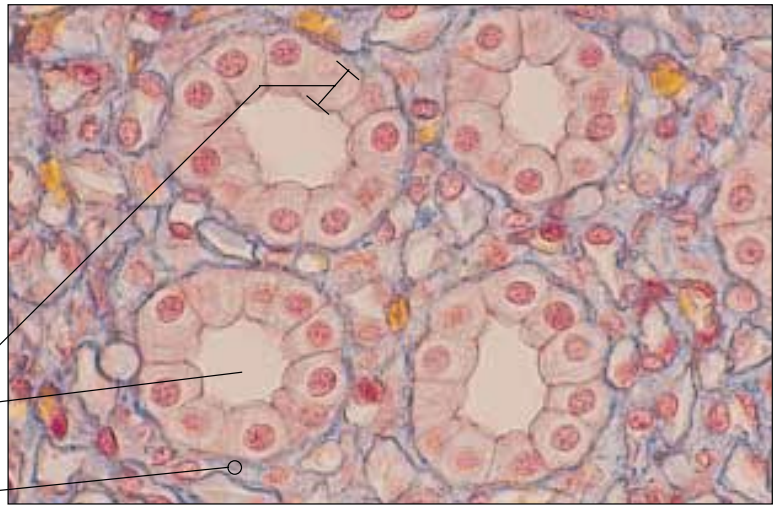


Figure 1-8
Simple Cuboidal Epithelium Although not strictly cube shaped, cuboidal cells are roughly equidimensional in length, width, and depth. Single layer of cells lining surface of kidney tubules. Cross section. (×250)



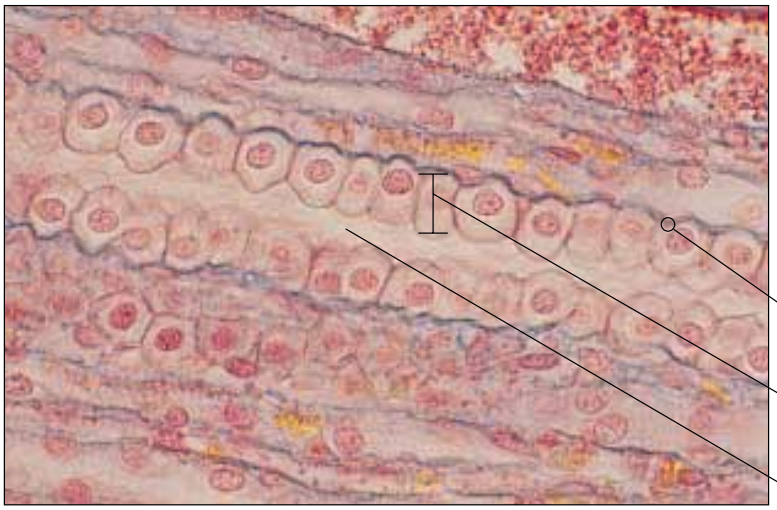


Figure 1-9
Simple Cuboidal Epithelium Longitudinal section of kidney tubule. (×250)

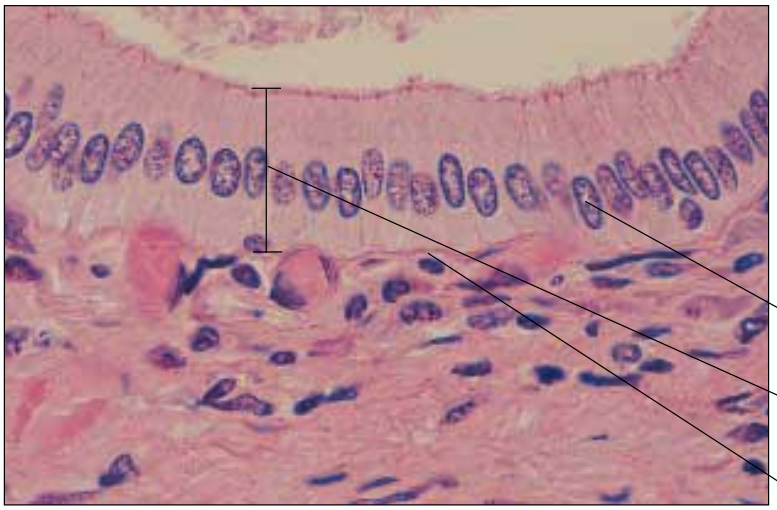


Figure 1-10
Simple Columnar Epithelium Cellular height is much greater than width or length. Nuclei generally appear in a row. From pancreatic duct. (×250)

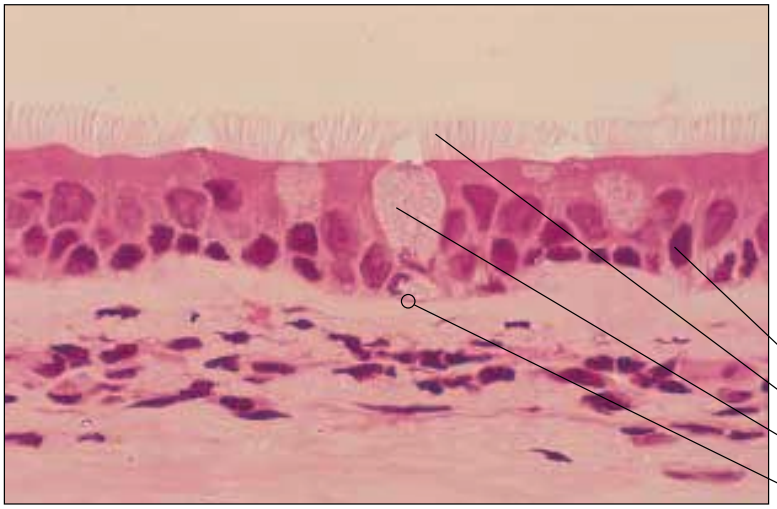


Figure 1-11
Pseudostratified Ciliated Columnar Epithelium Nuclei appear to lie in two rows, but in fact all cells in single layer are in contact with basement membrane. Section shows well-defined cilia, three goblet cells, basement membrane, underlying connective tissue. From monkey trachea. (×100)

Figure 1-12
Pseudostratified Ciliated Columnar Epithelium Section shows cilia, multiple layers of nuclei, basement membrane, underlying connective tissue. From human trachea. (×250)

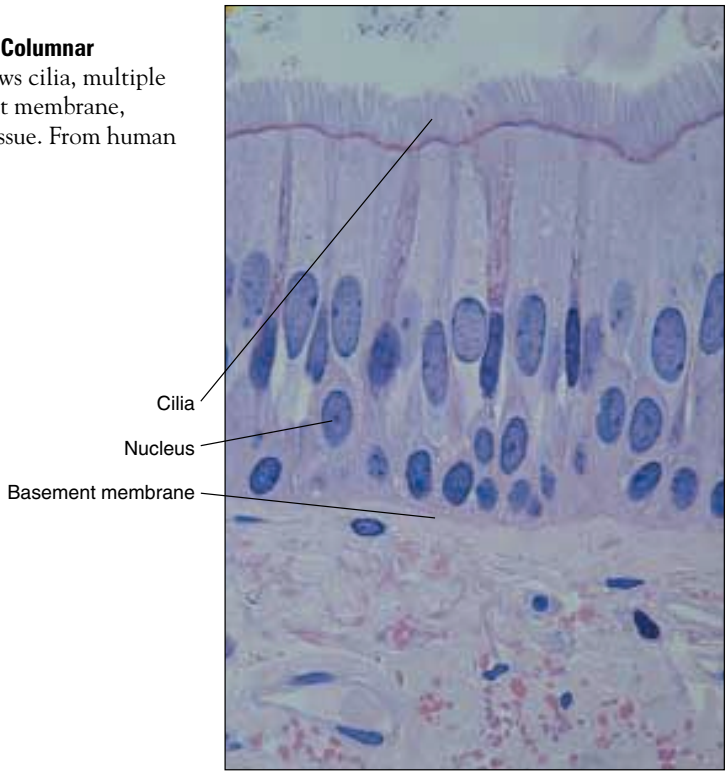
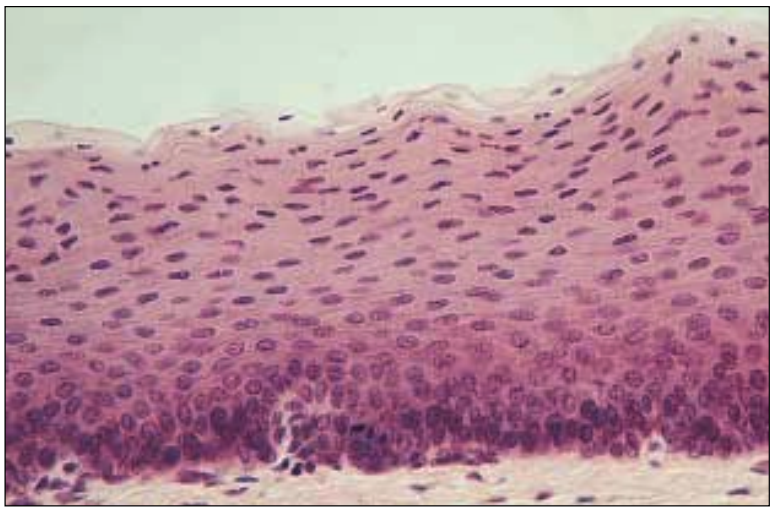


Figure 1-13
Stratified Squamous Epithelium Flattened cells at surface change to less flattened morphology in deeper layers. Oral cavity of rabbit. (×100)



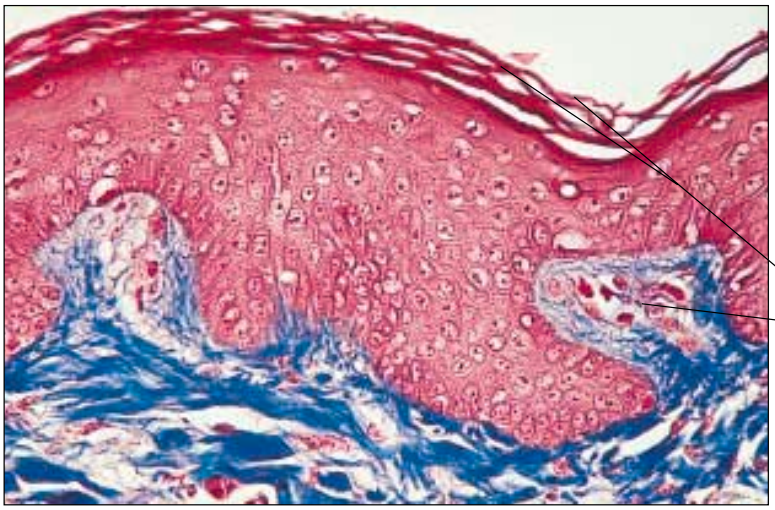


Figure 1-14
Stratified Squamous Epithelium Flattened, keratinized cells at surface show variations in form in deeper layers. From human skin. (×100)

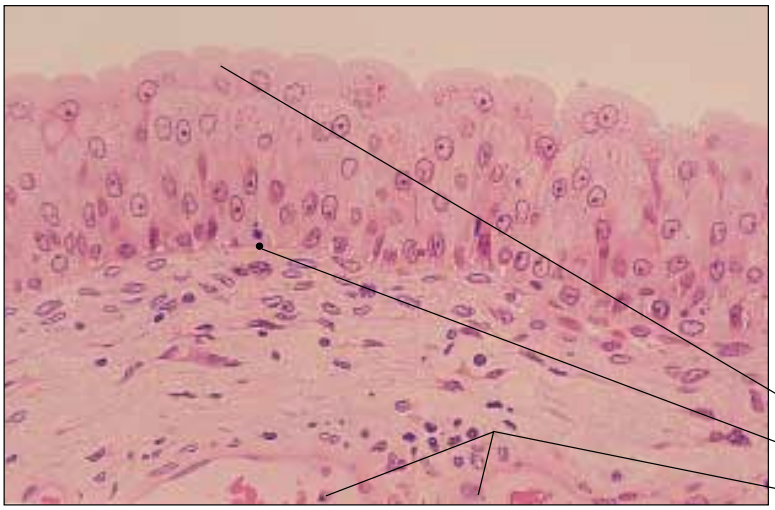


Figure 1-15
Transitional Epithelium from Urinary Bladder Umbrella cells stretch and flatten as bladder fills. Basement membrane separates epithelium from underlying connective tissue containing blood vessels. (×250)

Figure 1-16
Wall of Elastic Artery Extracellular elastic fibers running parallel in a plane. Structure permits tissue elasticity and recoil. From aorta. (×100)

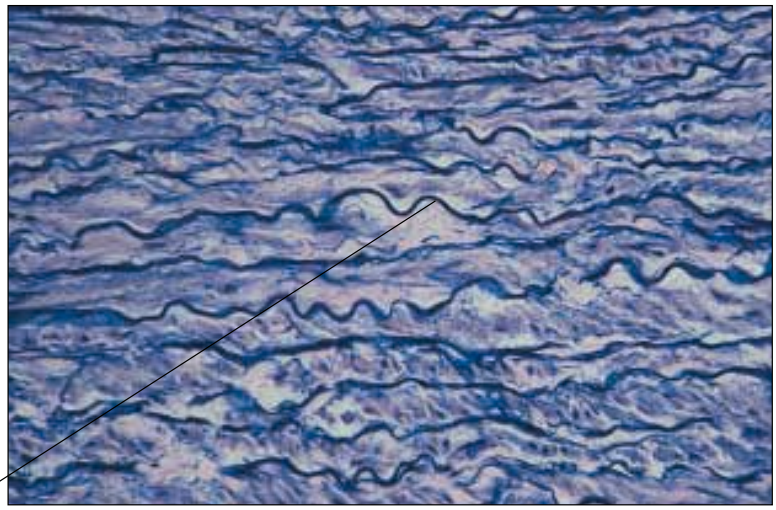


Figure 1-17
Reticular Connective Tissue Mesh of reticular fibers appears as dark lines; provides scaffold for cellular organization of this lymph node. (×250)

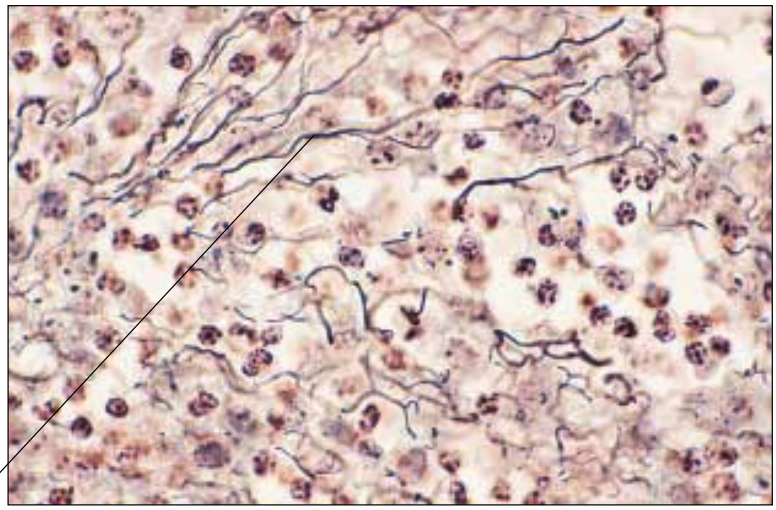
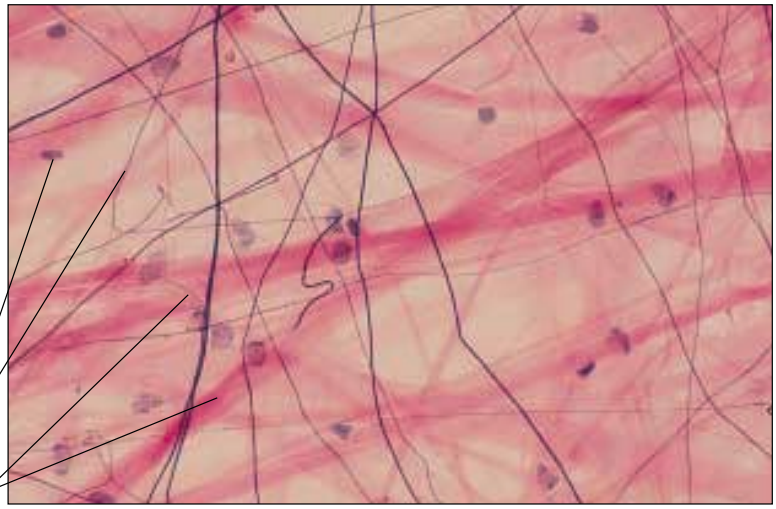


Figure 1-18
Loose (Areolar) Connective Tissue Pink bands of collagen fibers run in all directions through intercellular spaces of subcutaneous tissue, permit flexible resistance to mechanical stress. (×100)



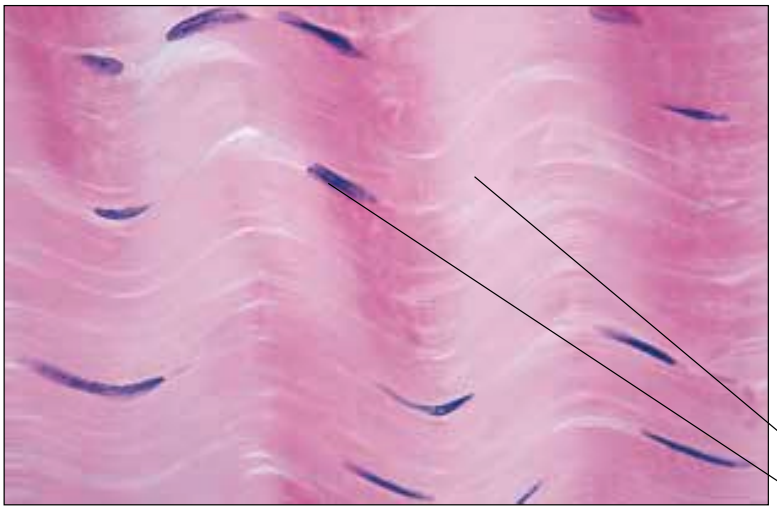


Figure 1-19
Dense Regular Connective Tissue Bands of collagen fibers running in regular, parallel rows resist mechanical stress mainly along course of fibers. Monkey tendon. (×250)

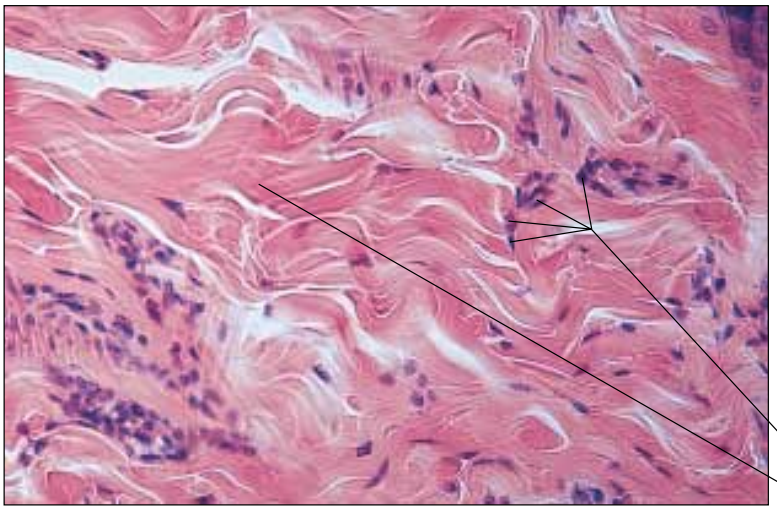


Figure 1-20
Dense Irregular Connective Tissue Bands of collagen running in irregular rows give multidirectional tensile strength. Collagen-secreting fibroblasts appear throughout. (×100)

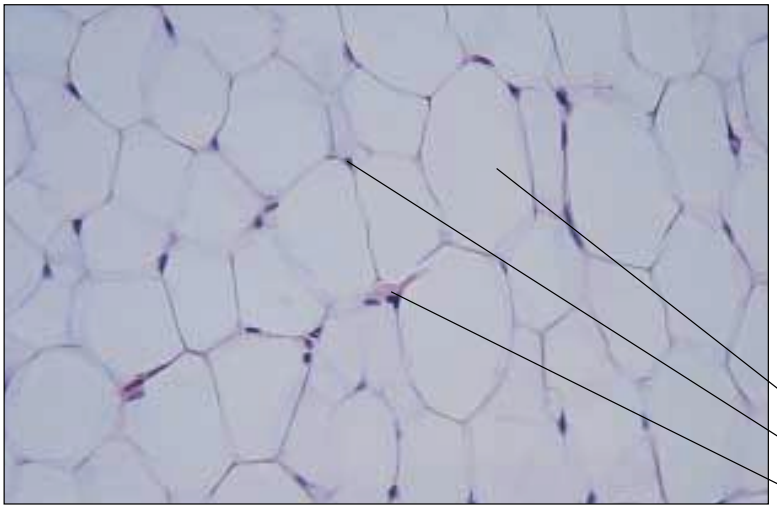
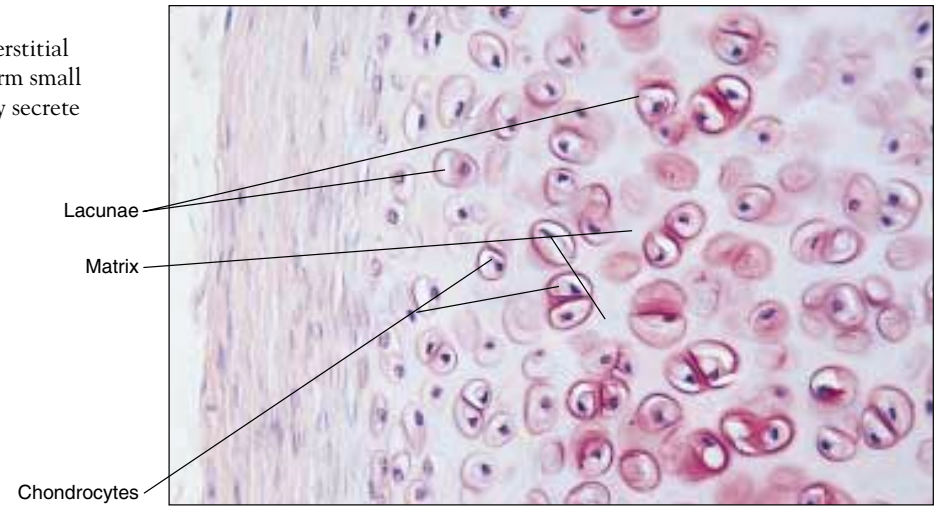


Figure 1-21
Adipose Tissue Large, empty, polyhedral vacuoles dominate small, eccentrically located cell nuclei of adipocytes. Fine capillaries run through tissue. (×100)

Figure 1-22
Fibrocartilage Cell nests of chondrocytes in territorial matrix surrounded by coarse extracellular fibers. (×250)

Figure 1-23
Hyaline Cartilage During interstitial growth, cartilage cells often form small clusters and move apart as they secrete extracellular matrix. (×100)



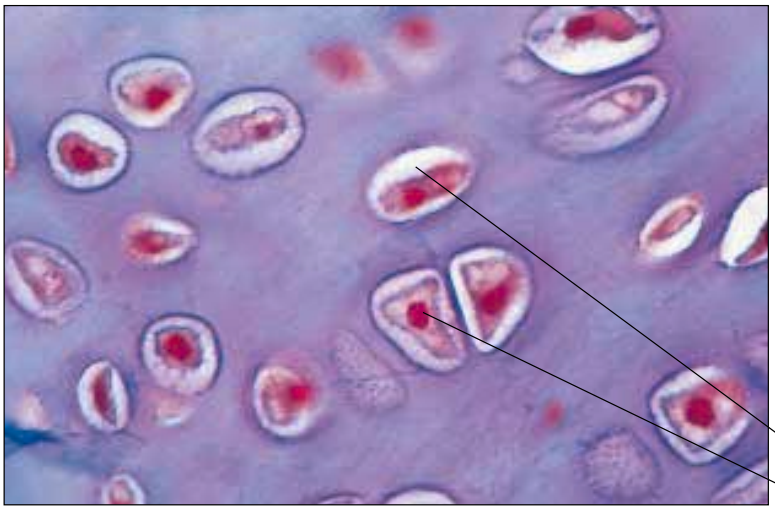


Figure 1-24
Hyaline Cartilage Artifactual vacuolation forms characteristic lacunae around chondrocyte cell bodies. From trachea. (×250)

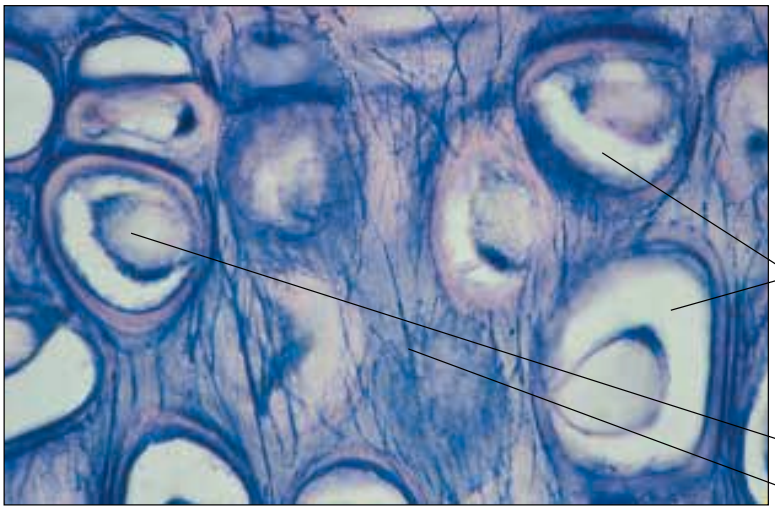


Figure 1-25
Elastic Cartilage Extracellular matrix contains elastic fibers that confer elastic recoil to this tissue. (×250)

Figure 1-26

Skin Thick, keratinized, multilayered **stratum corneum** rests atop grainy **stratum granulosum** (stratum lucidum not clearly evident). **Stratum spinosum,** composed of irregularly shaped cells with indistinct nuclei, lies atop single, clearly nucleated **stratum basale.** Human palm. (×100)

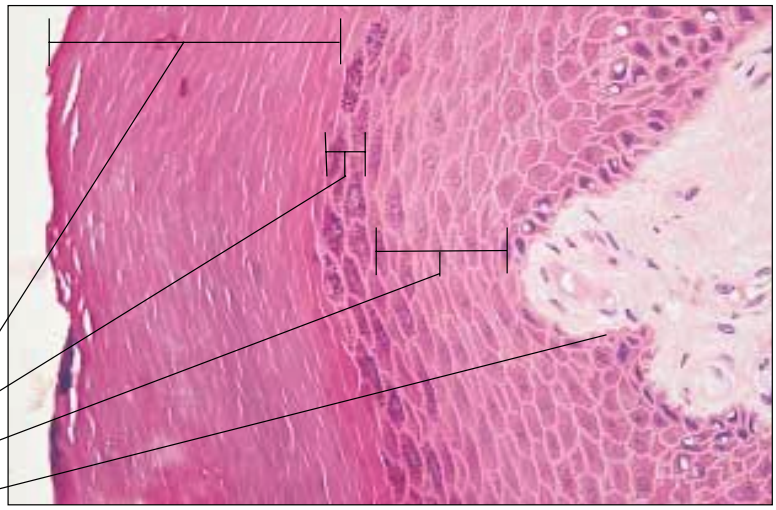


Figure 1-27

Skin Squamous epidermis with cornified layers overlying darkly stained stratum basale and connective tissue of underlying dermis. Single papilla visible. Human scalp. (×100)

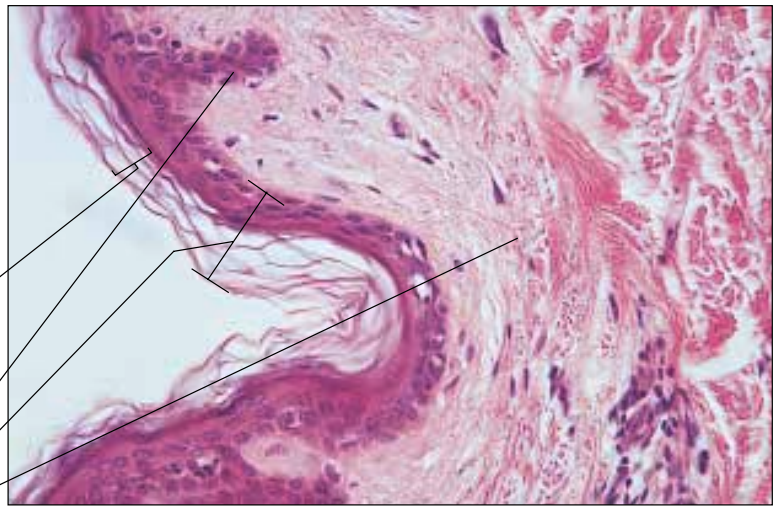
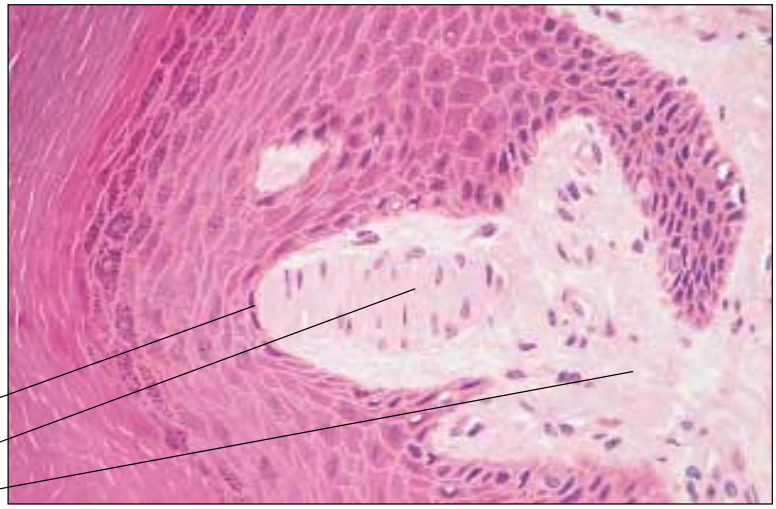


Figure 1-28

Meissner's Corpuscle in Dermis Elongated oval body located in dermis just below stratum basale is thought to be responsible for part of fine touch reception. (×100)



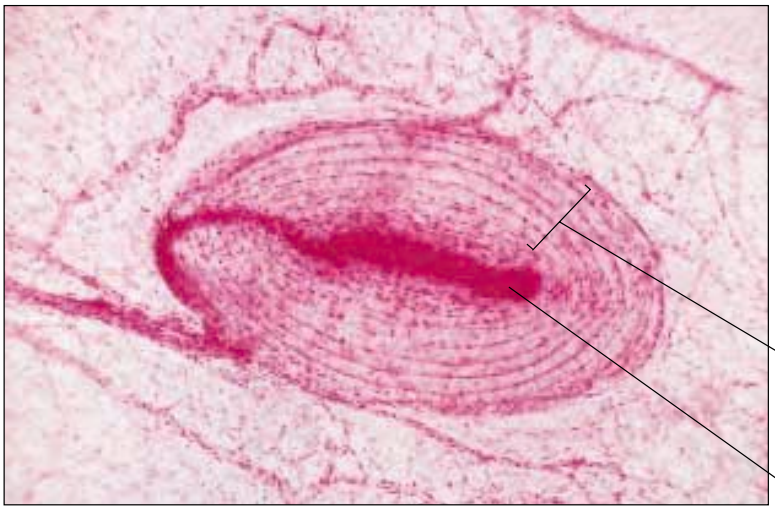


Figure 1-29
Pacinian Corpuscle Encapsulated nerve ending found deep in dermis and throughout interior of body detects pressure. (×25)

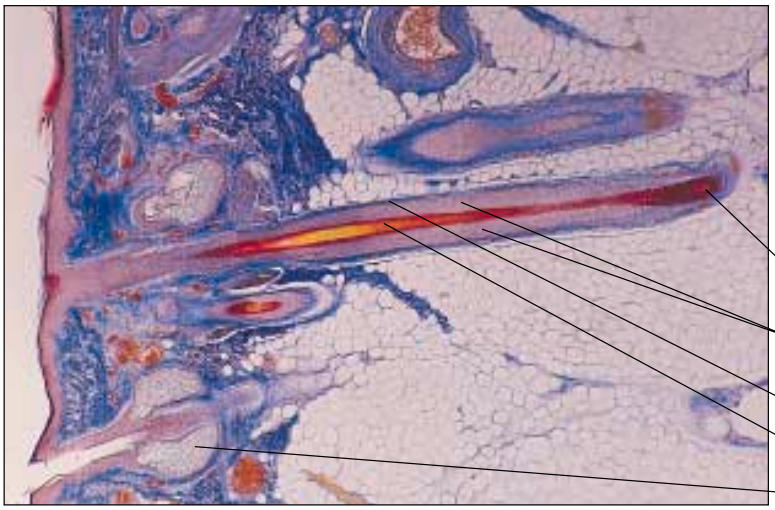


Figure 1-30
Human Scalp with Hair Follicle Follicle root, with sheath embedded in pale adipose tissue, has sebaceous glands surrounding it near surface. (×10)

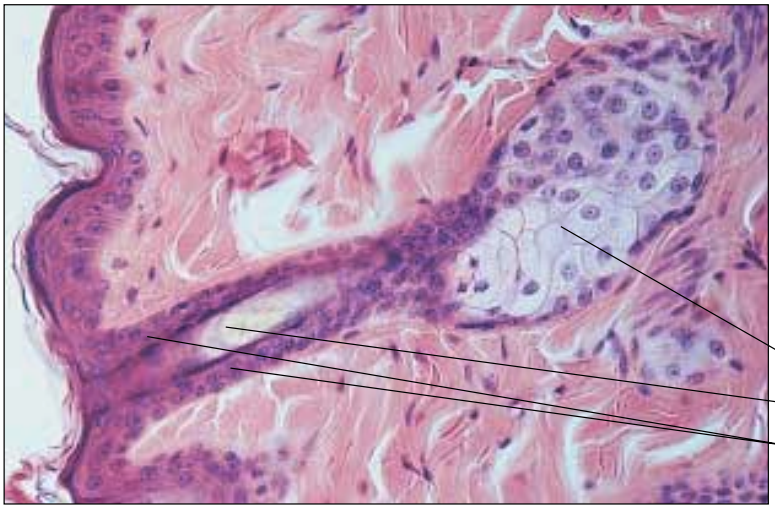


Figure 1-31
Detail of Sebaceous Gland Nucleated germinative cells at base of gland mature and accumulate lipid. At duct, they degenerate and lyse to release their oily product, sebum. (×100)

Figure 1-32

Compact Bone Center of "tree ring" structure, Haversian canal contains blood vessel. Osteocytes imprisoned in small, dark lacunae surrounding central Haversian canal receive nutrition and communicate via canaliculi, or little canals. Human. (×50)

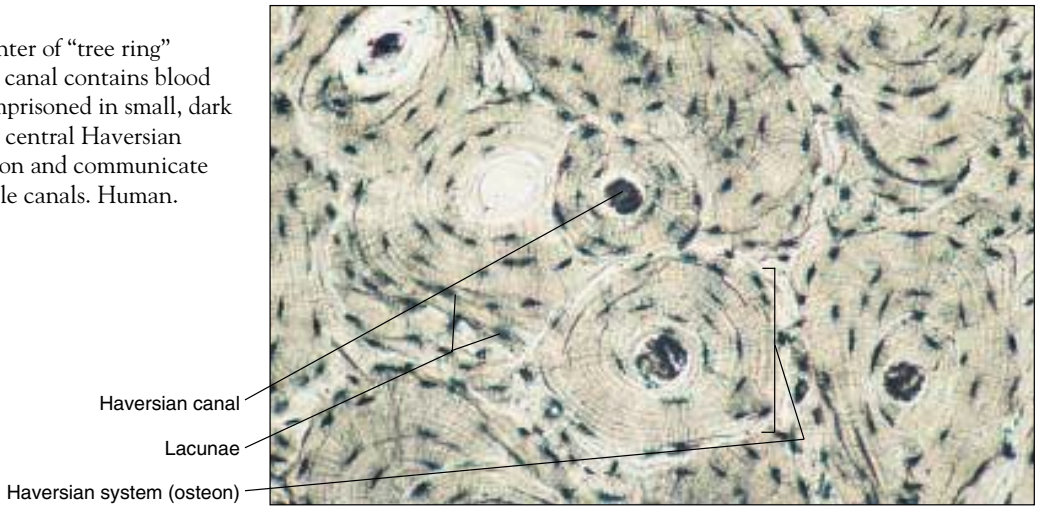


Figure 1-33

Detail of Compact Bone Haversian system evident.

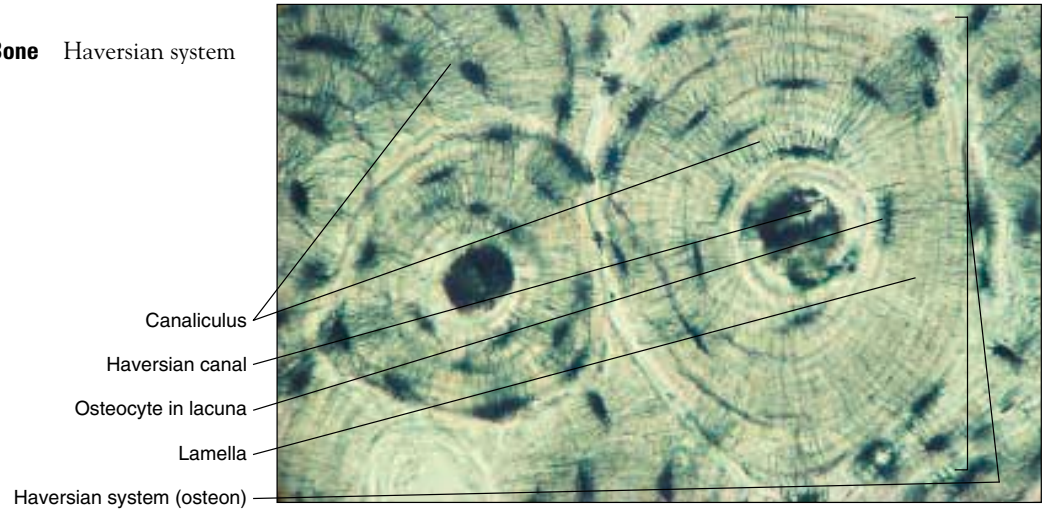
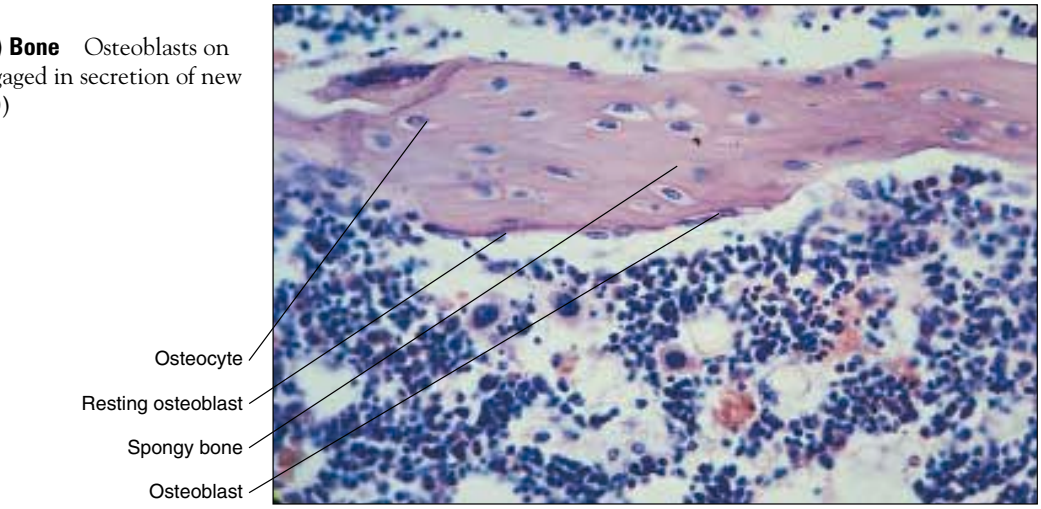


Figure 1-34

Cancellous (Spongy) Bone Osteoblasts on spongy bone are engaged in secretion of new bony matrix. (×100)



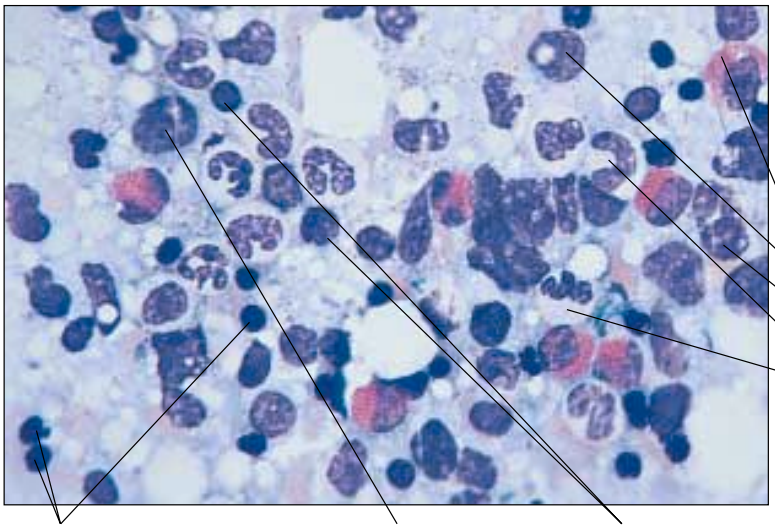


Figure 1-35
Red Bone Marrow Medullary cavity in the head of long bones of the adult contains stem cells, precursors to red blood cells, and white blood cells and platelets. Human. (×250)

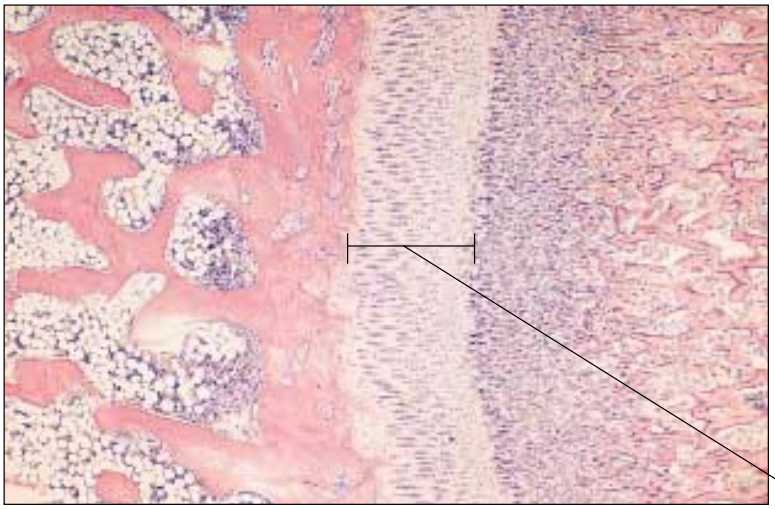


Figure 1-36
Developing Bone at Epiphyseal Plate Middle belt of cartilage undergoing primary calcification is replaced by new bone.

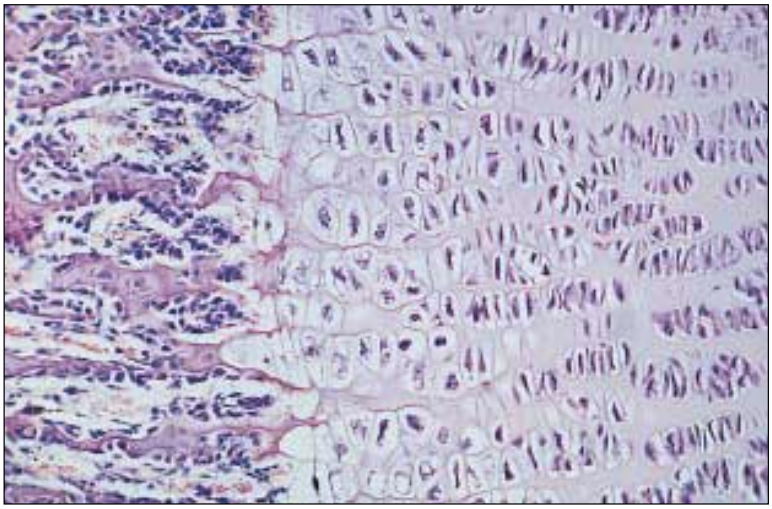


Figure 1-37
Detail of Epiphyseal Plate Epiphyseal plate cartilage at right transforms into zones of proliferating chondrocytes with primary ossification occurring on their calcified remnants. Newly formed bone appears at left. (×50)

Figure 1-38

Striated (Skeletal) Muscle (Cross Section) Eccentrically located multiple nuclei accompany individual cells (fibers), each of which contains many myofibrils. Human tongue. (×250)

Figure 1-39

Striated (Skeletal) Muscle Fiber (Longitudinal Section) Banded appearance arises from regular arrangement of overlapping bundles of thick and thin filaments (myosin and actin, respectively). Eccentrically located nuclei are thin and elongated. (×250)

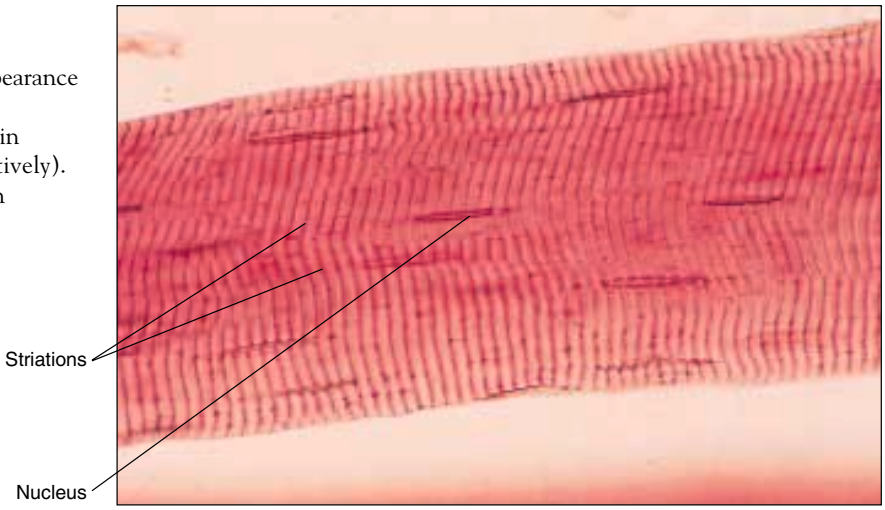
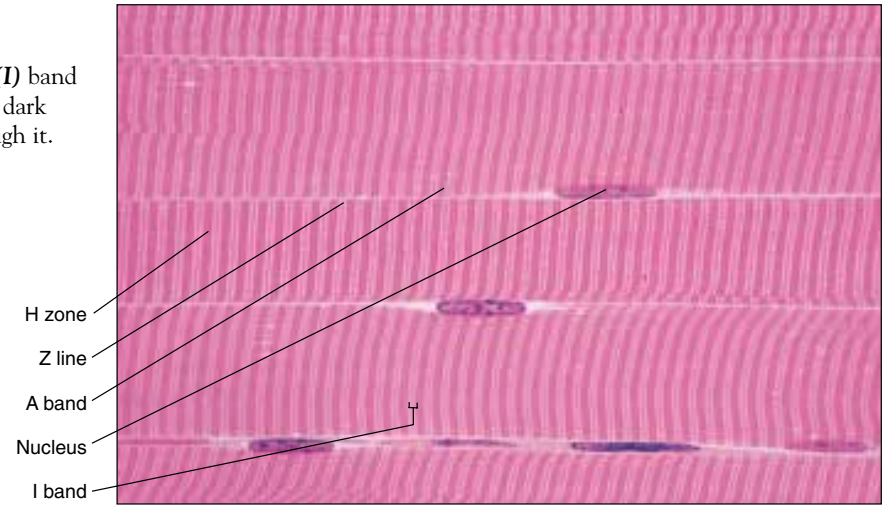


Figure 1-40

Striated (Skeletal) Muscle Fibers (Longitudinal Section) Each light ***(I)*** band has a dark ***(Z)*** line through it. Each dark ***(A)*** band has a light ***(H)*** zone through it. (×250)



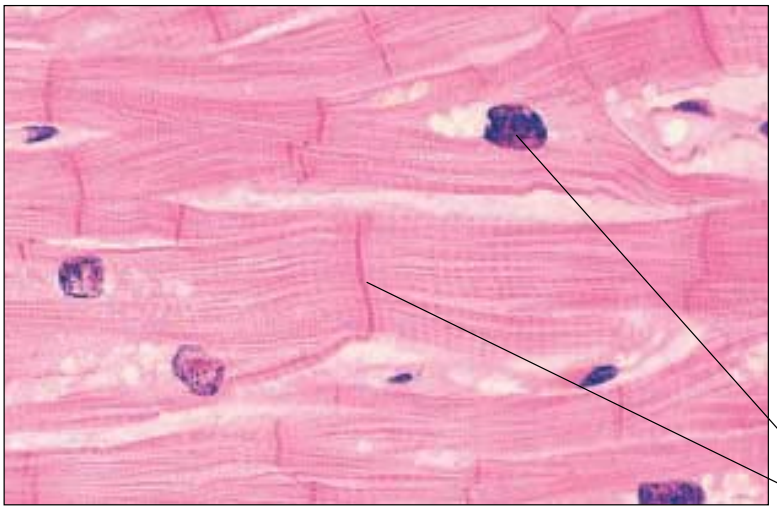


Figure 1-41
Cardiac Muscle (Longitudinal Section)
Multinucleated, striated muscle fibers branch and anastomose at junctions marked by dark intercalated disks. (×250)

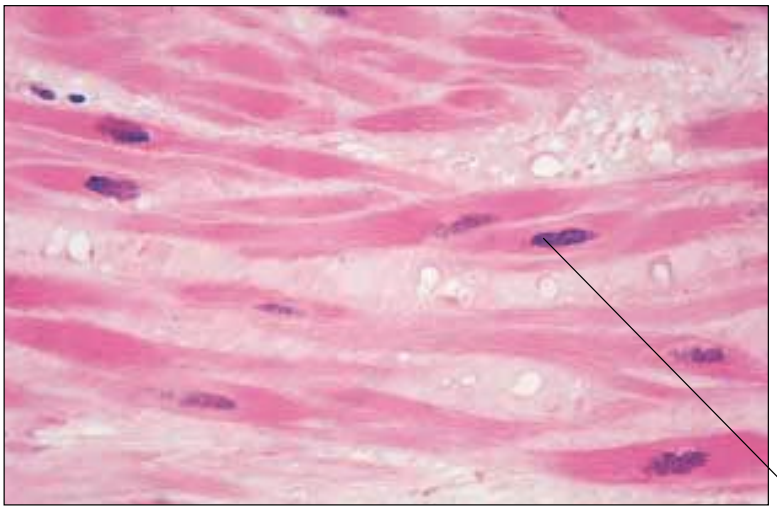


Figure 1-42
Smooth Muscle (Longitudinal Section)
Canoe- or spindle-shaped muscle cells lack striations, and each has a single, elongated nucleus. (×250).

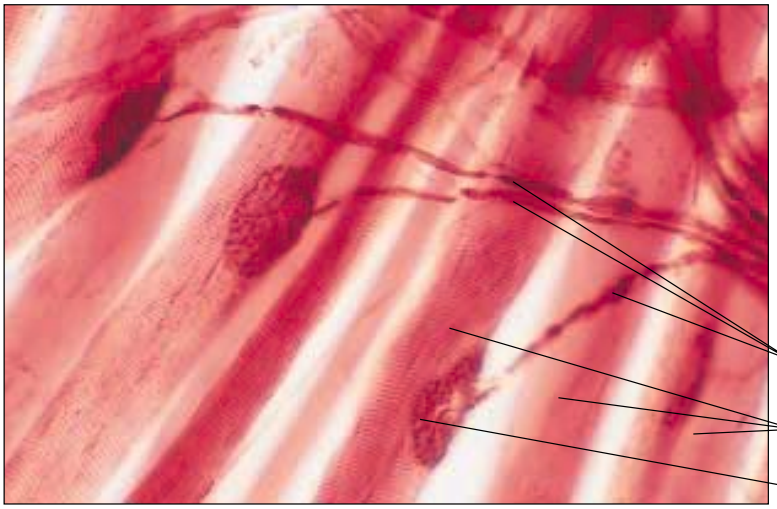


Figure 1-43
Innervation of Skeletal Muscle: Motor Endplate Branching nerve bundle terminates in small, specialized dents, the **myoneural junctions.** Nerve terminals release small quantities of chemical neurotransmitter to stimulate muscle contraction.

Figure 1-44
Astrocytes (Neuroglia) Star-shaped supporting cells of central nervous system modulate ionic environment. Cytoplasmic extensions make contact with blood vessel. Cat. (Silver stain; ×280)

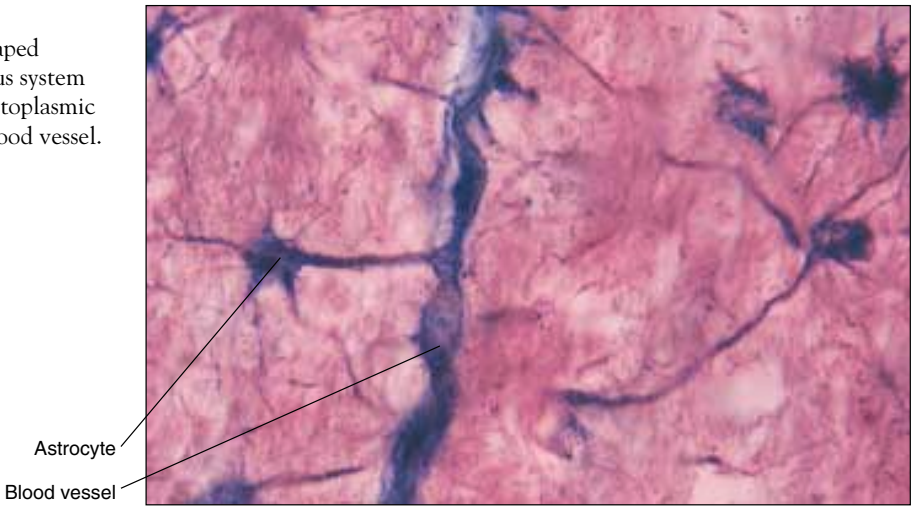


Figure 1-45
Purkinje Cells (Neurons) Numerous branched processes (dendrites) receive information for processing. Single process (axon) sends information to other neurons. Human cerebellum. (×100)

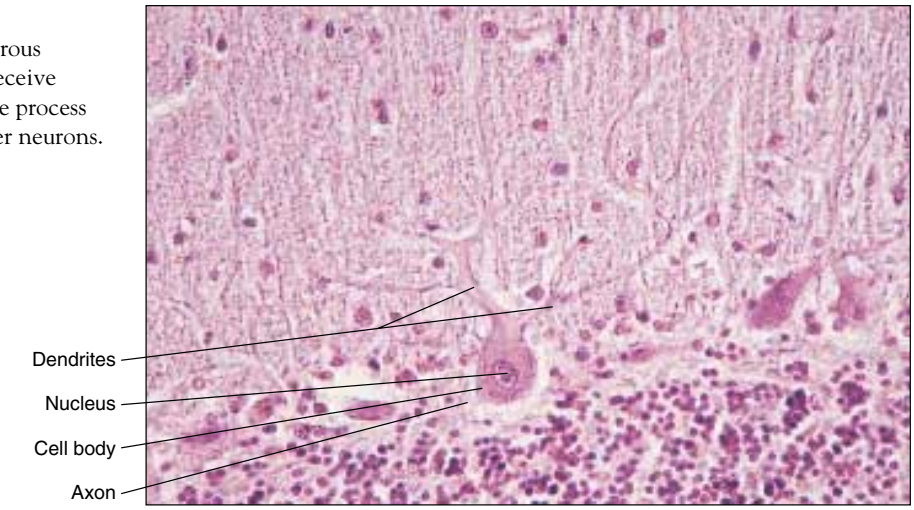
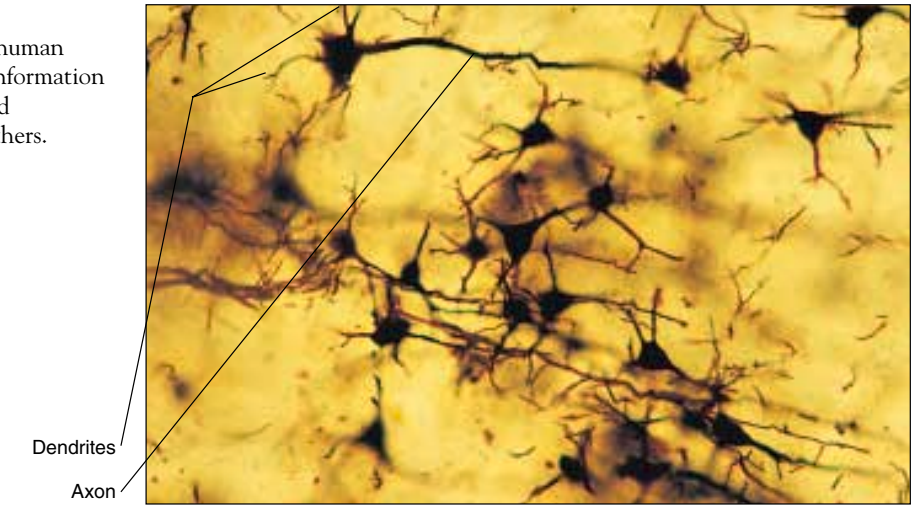


Figure 1-46
Pyramidal Cells Neurons from human cerebral cortex directly receive information from hundreds of other cells; send information on to hundreds of others. (Fox-Golgi stain; ×100)



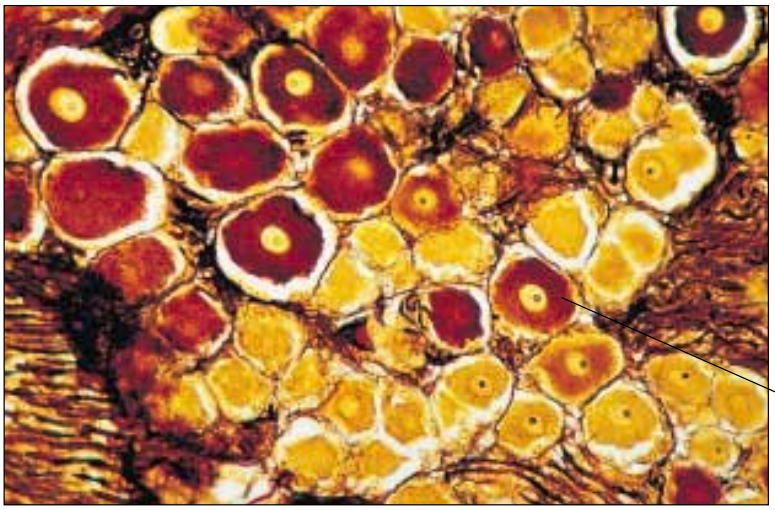


Figure 1-47
Dorsal Root Ganglion Sensory signals representing pain, temperature, pressure, muscle tension, joint position, and others depend on these cells. Their dendrites collect sensory information throughout the body and axons route it into the spinal cord. (×100)

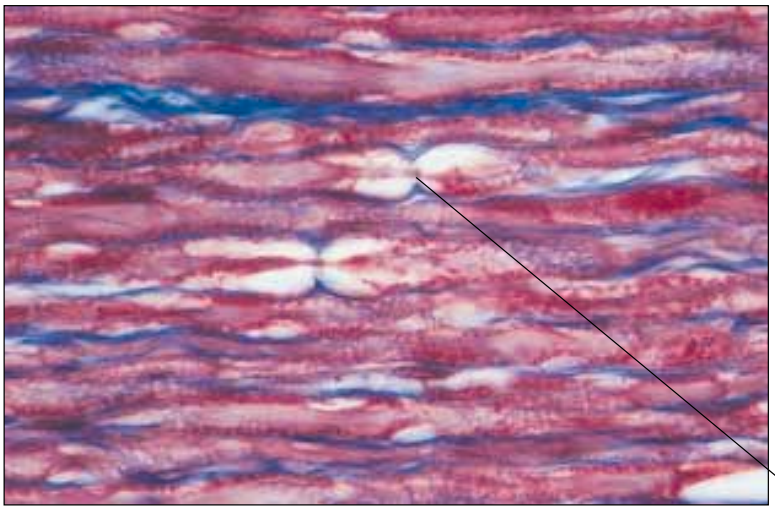


Figure 1-48
Nerve Fibers (Longitudinal Section) Clear areas show dimpling characteristic of nodes of Ranvier. (×250)

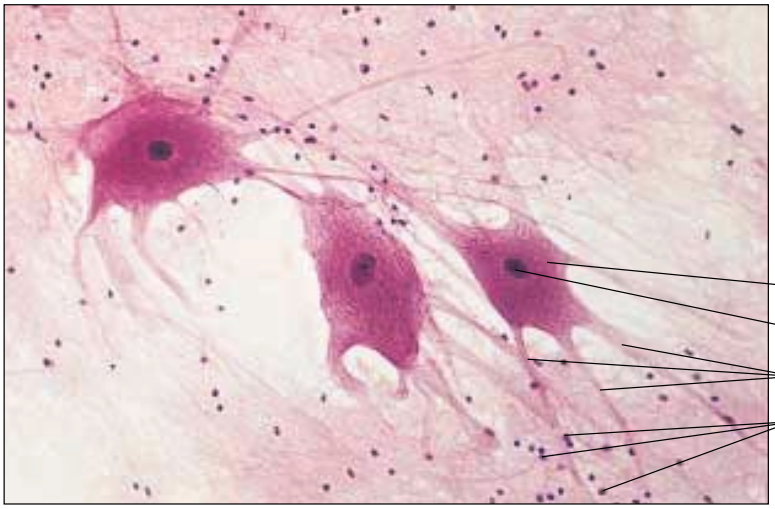


Figure 1-49
Motor Neurons of the Spinal Cord Integrated command information from the brain and sensory signals enter these cells, whose efferent activity controls muscular contraction. Numerous synapses occur on dendrites and cell body (soma). (×50)

Figure 1-50

Myelinated Nerve Fibers (Cross Section)
Central core stains dark; insulating myelin appears white. (×250)

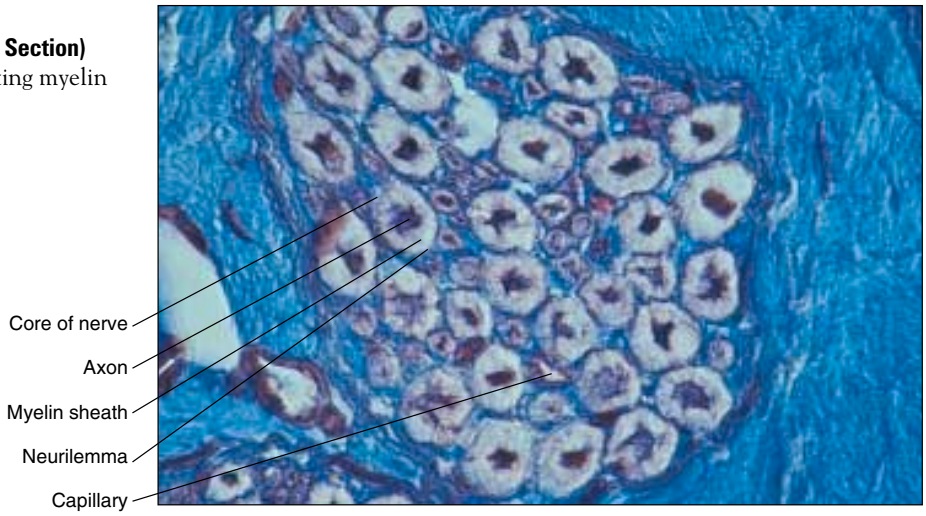


Figure 1-51

Spinal Cord, Lumbar Region (Cross Section)
Top is dorsal, bottom is ventral. Light central dot is central canal. Darkly staining H-shaped region is grey matter of cell bodies; surrounding lighter material is composed of myelinated axons. Ventral horns of gray matter contain motor neurons; dorsal horns contain cell bodies of sensory pathways. (×4)

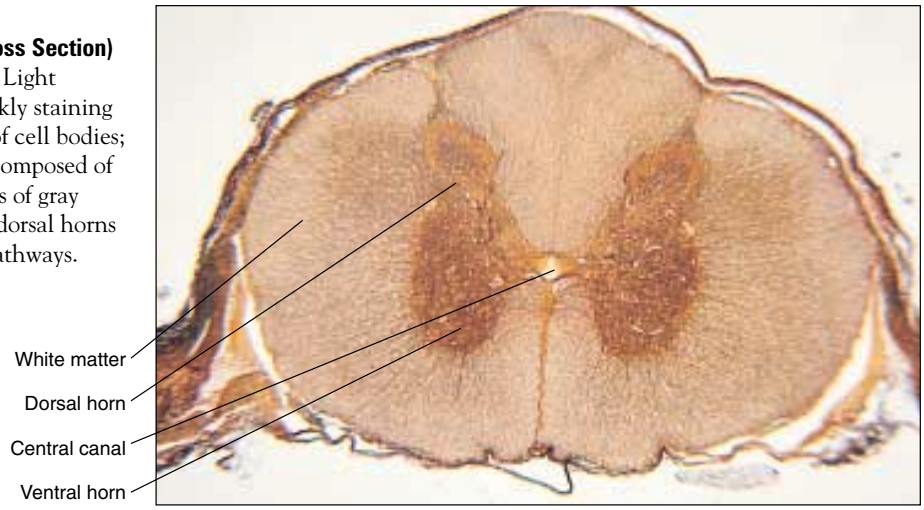


Figure 1-52

Retina Layered structure evident. Dark line of cells near top is pigment epithelium. Broad striped region represents photoreceptors (rods and cones), whose nuclei stain heavily immediately beneath. Below receptor nuclei lie synaptic region and a layer of nuclei belonging to bipolar cells. Bipolar cell output synapses onto ganglion cells, only a few of which appear near bottom. Axons of ganglion cells form optic nerve. (×100)

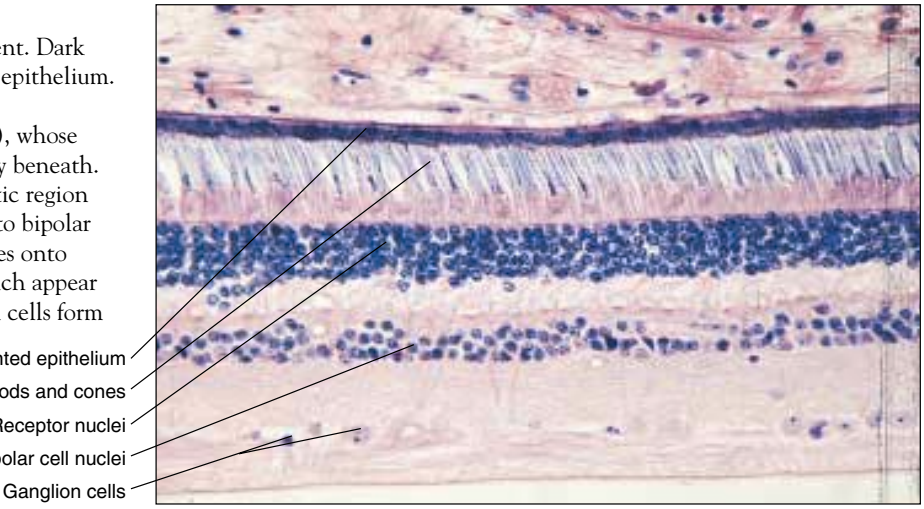


Figure 1-53a
Organ of Corti Thick finger of tectorial membrane extends from right to stimulate complex of four hair cells (three on left, one on right) of central structure that rests on important basilar membrane. Nerve fibers from hair cells exit right to spiral ganglion for processing and transmission of messages to brain. (×100)

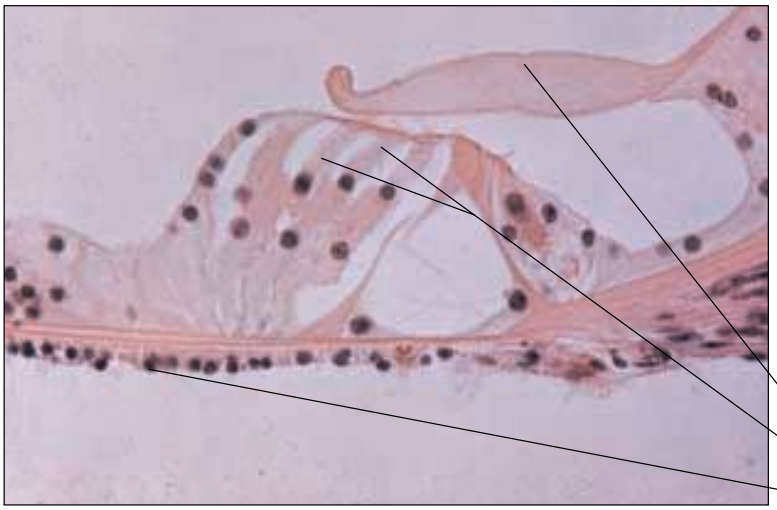


Figure 1-53b
The Organ of Corti High magnification. (×500)

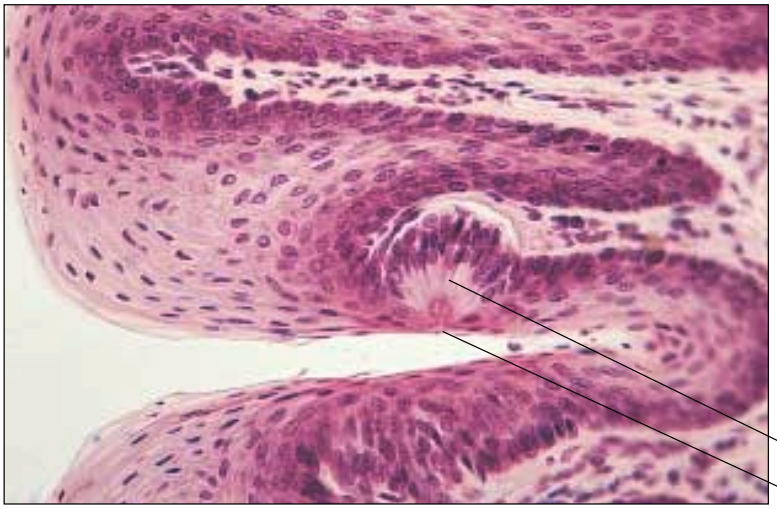


Figure 1-54
Taste Bud Dissolved chemicals enter fungiform papilla through small pore to directly stimulate sensory cells and initiate taste perception. (×100)

Figure 1-55
Thyroid Gland Follicles Cuboidal epithelium surrounds endocrine follicles of the thyroid gland, the only gland that stores substantial amounts of its own hormone. (×100)

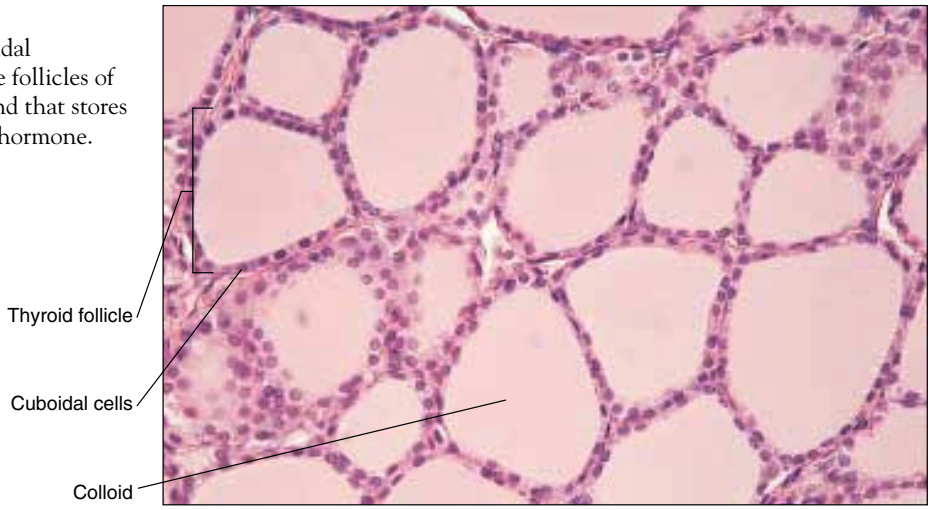


Figure 1-56
Parathyroid Gland LM of section through the parathyroid gland. (×40)

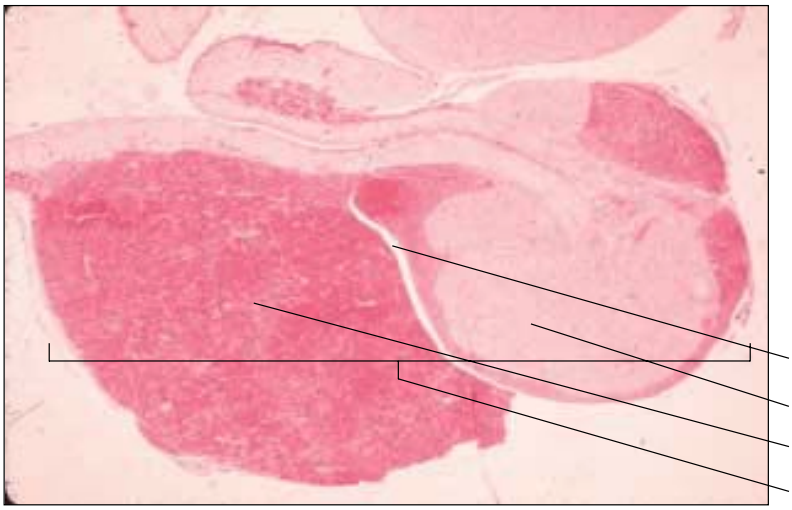


Figure 1-57a
Pituitary Gland The pituitary gland consists of two components: the posterior component, or neurohypophysis (light stain), consists of mainly nervous tissue, whereas the anterior component, or adenohypophysis (dark stain) consists of a glandular epithelium. (×10)

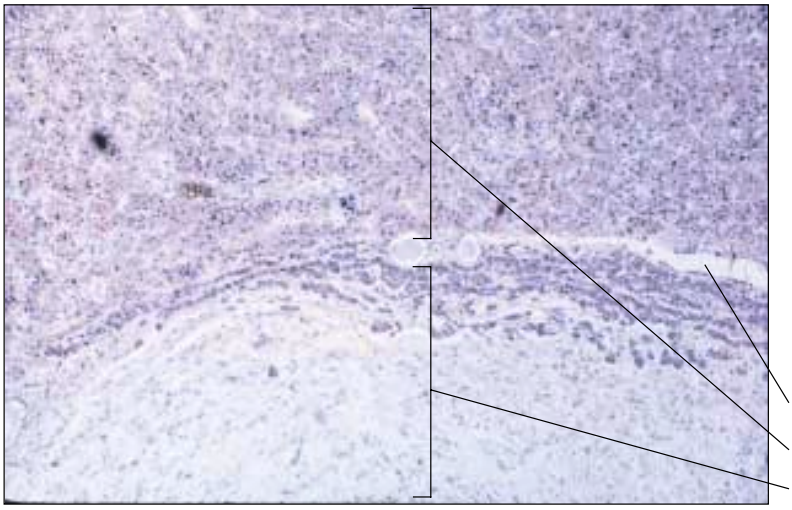


Figure 1-57b
Pituitary Gland The cleft between the neurohypophysis and adenohypophysis is visible in this view of the pituitary gland. (×100)

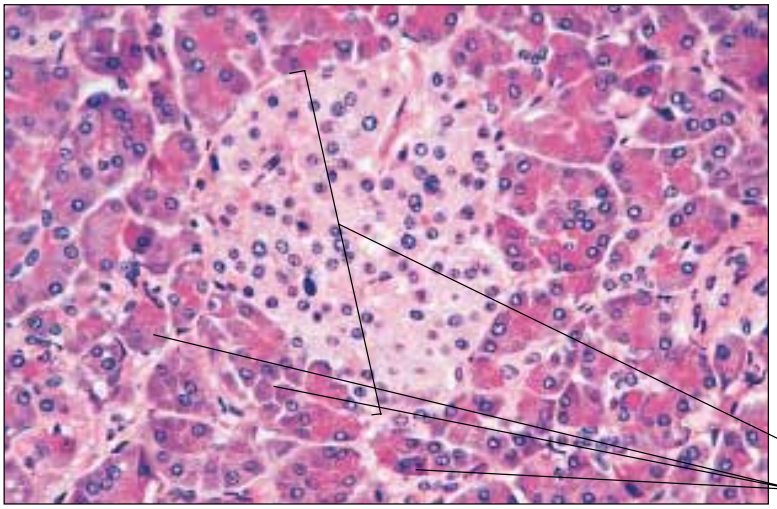


Figure 1-58
Pancreas The pancreatic islet of Langerhans cells form the endocrine portion of the pancreas. Alpha cells secrete glucagon, beta cells secrete insulin, and delta cells secrete somatostatin. The exocrine portion of the pancreas secretes digestive enzymes through a series of ducts.

Figure 1-59

Adrenal Cortex Outer zone of rounded groups of cells (zona glomerulosa) secretes mineralcorticosteroids (aldosterone). Middle zone of cells appearing in rows (zona fasciculata) secretes glucocorticosteroids. Innermost zone of cells arranged in a meshwork (zona reticularis) secretes mainly androgens. (×50)

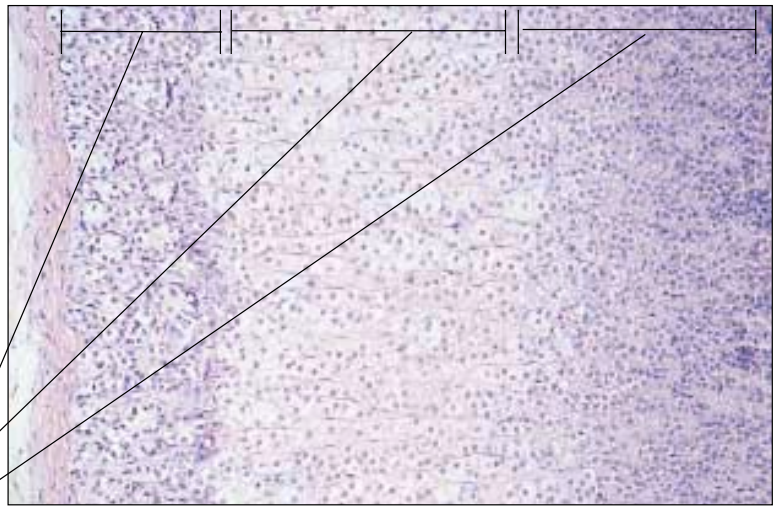
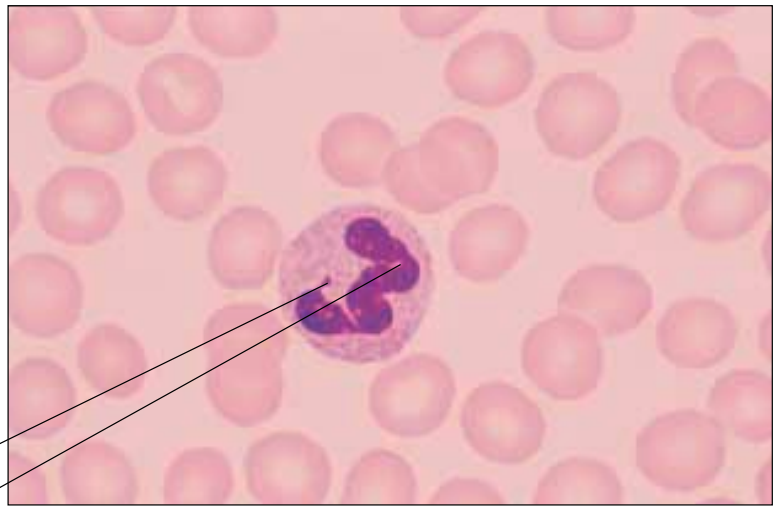


Figure 1-60

Neutrophil Most numerous (65%) of the leukocytes, it is characterized by a multilobed nucleus and granular cytoplasm. Engages in phagocytosis. (Neutral dyes stain; ×640)



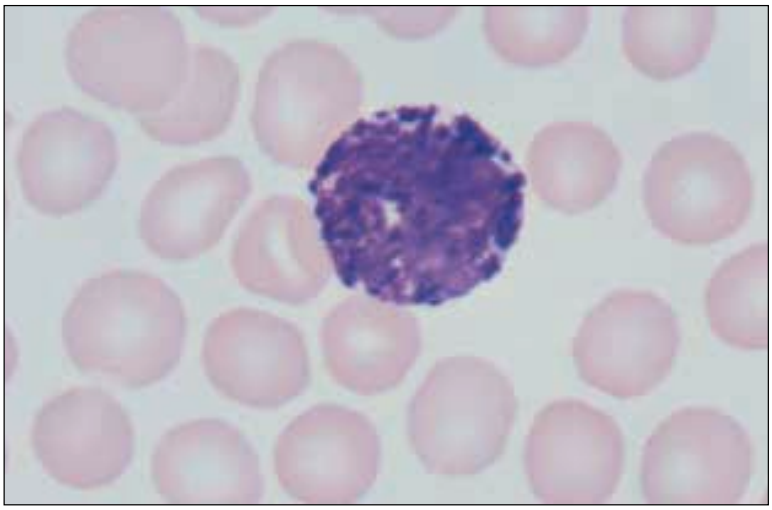


Figure 1-61
Basophil Normally the rarest (1%) of the leukocytes, its kidney-shaped nucleus may be almost obscured by cytoplasmic granules. These cells contain numerous chemicals involved in inflammation. (Basic dyes stain; ×640)

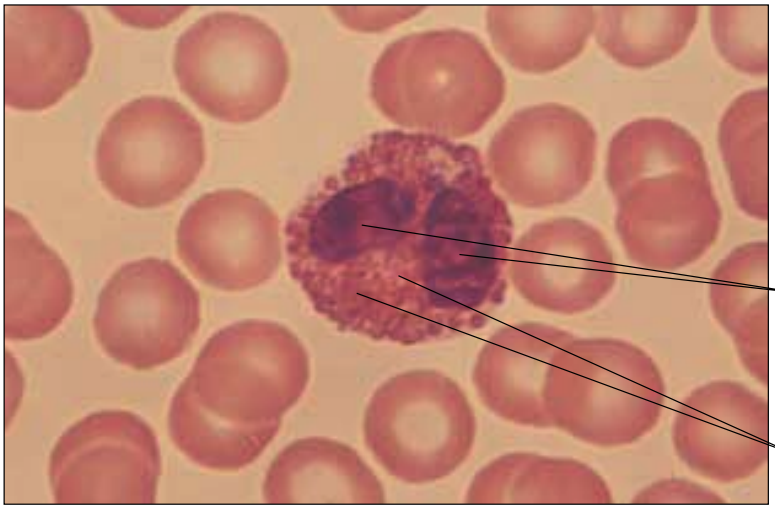


Figure 1-62
Eosinophil Relatively rare (6%) leukocyte. Usually identifiable because of red-to-orange-staining cytoplasmic granules. Function not definitely known but elevated especially in allergies. (Selective eosin stain; ×640)

Figure 1-63

Lymphocyte Common (25%). Characterized by single-lobed, "dented" nucleus surrounded by clear cytoplasm. May be large or small. Heavily involved in the immune response including synthesis of antibodies. (×640)

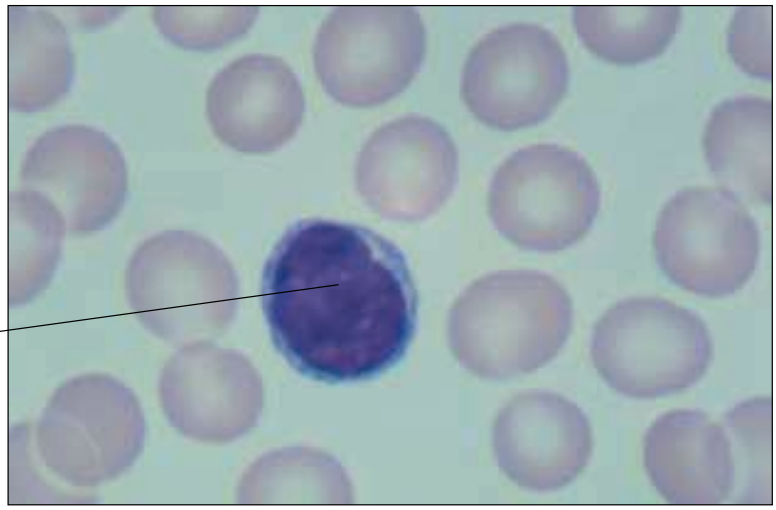
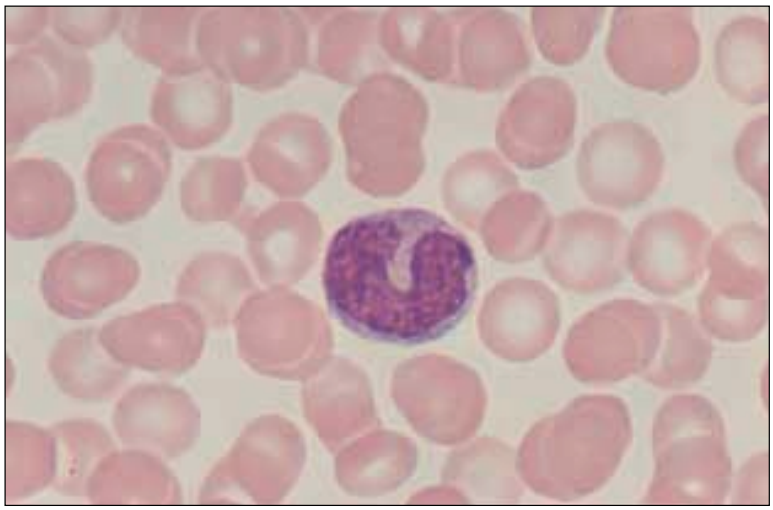


Figure 1-64

Monocyte Relatively rare (3%). Lobed, often kidney-shaped nucleus is surrounded by clear cytoplasm. Largest of the leukocytes, this cell is a scavenger and engages in phagocytosis. (×640)



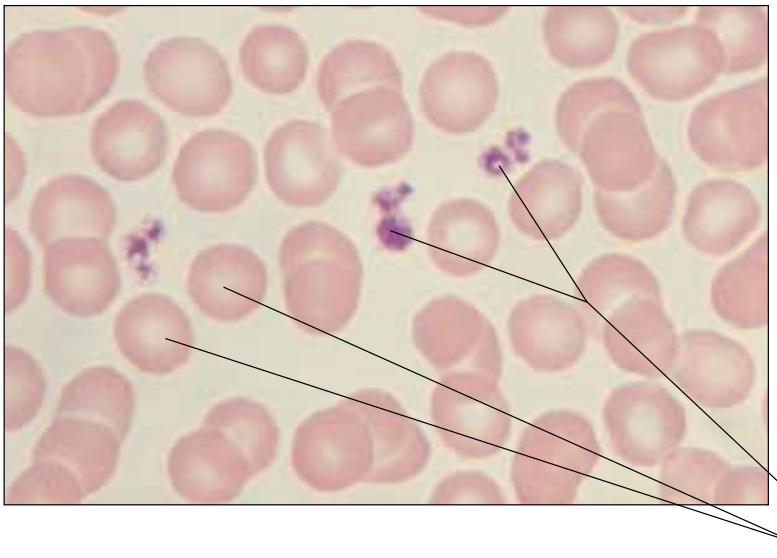


Figure 1-65

Erythrocytes (Red Blood Cells) and Platelets Circulating erythrocytes are far more common than any of the leukocytes. Normally they have no nucleus but contain the red pigment hemoglobin, which permits them to transport oxygen and carbon dioxide throughout the body. Typically they assume the shape of a biconcave disk. Their diameter of about 7 microns is useful for comparing sizes of other histological structures. Platelets are cellular remnants of a much larger precursor. These remnants contain numerous chemicals, including those important for clotting and inflammation. Platelets initiate blood clotting by forming a plug at wound sites. (×500)

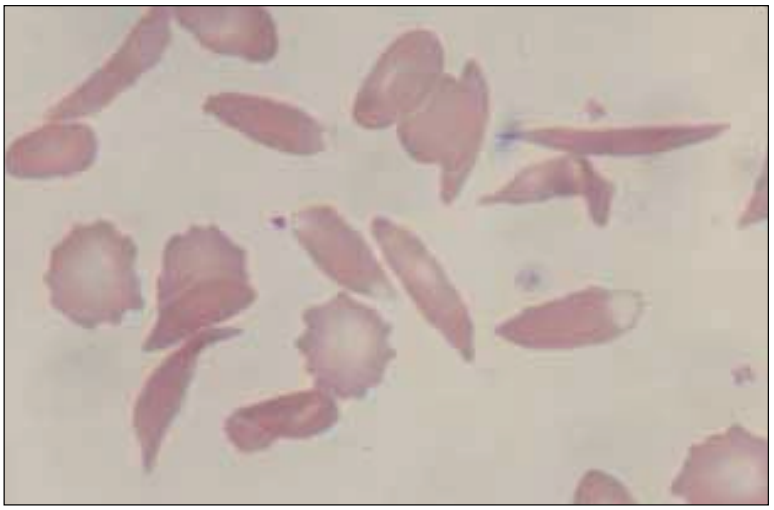


Figure 1-66

Sickle Cell Anemia Genetic alteration of hemoglobin results in altered membrane structure and abnormal wavy or elongated, curved shape that often resembles a sickle *(upper left)*. Oxygen-carrying capacity is much reduced. (×500)

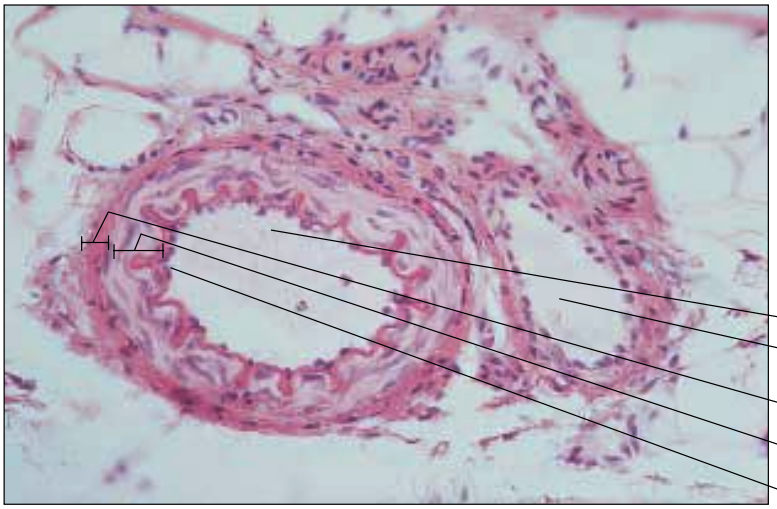


Figure 1-67

Artery (A) and Vein (V) Blood vessels possess a **tunica intima** that lines the lumen, outside of which is a muscular **tunica media,** and a connective tissue covering, the **tunica adventitia.** The tunica media of arteries is typically much thicker than that of veins. (×100)

Figure 1-68a

Arterial Cross Section Single layer of darkly stained cells, the tunica intima lines the lumen. Thick tunica media is composed of canoe-shaped smooth muscle cells. Outer adventitial layer of connective tissue provides elastic support and strength. (×50)

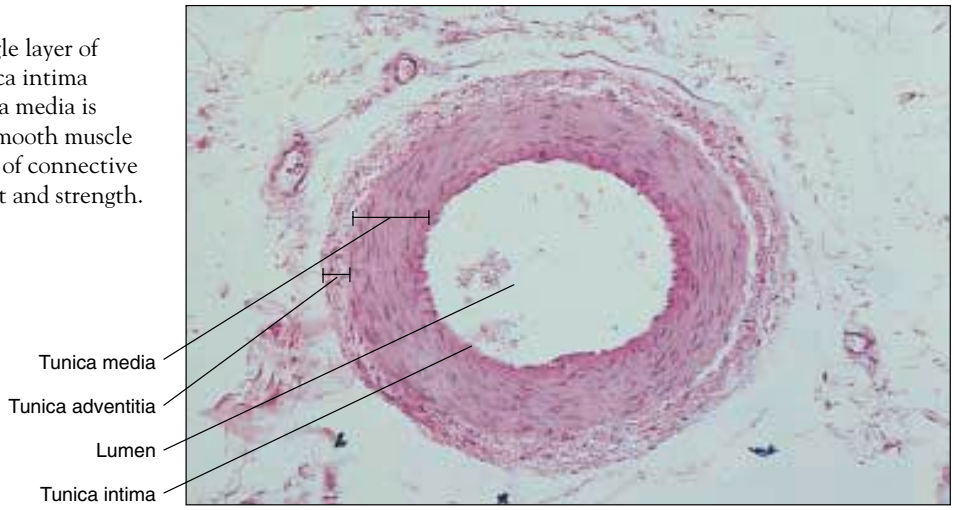


Figure 1-68b

Atherosclerosis Cross section of a healthy artery.

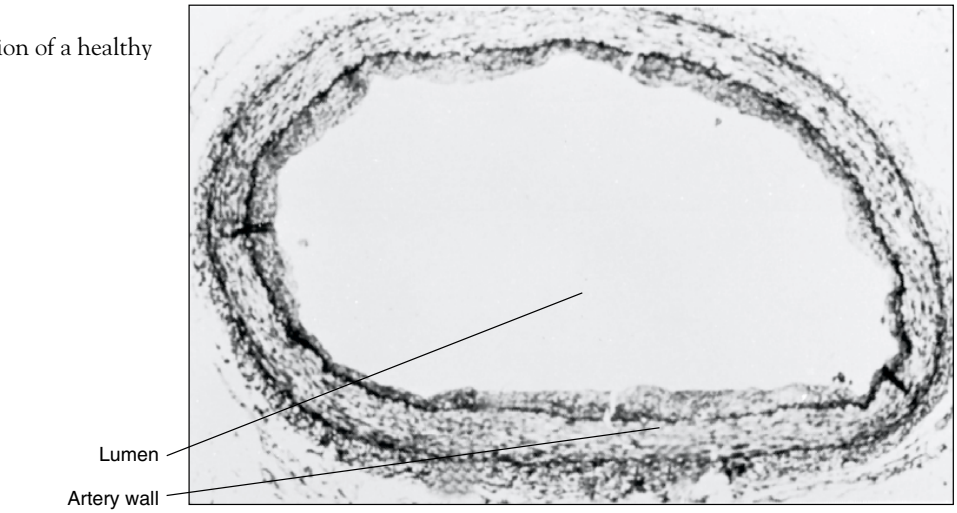
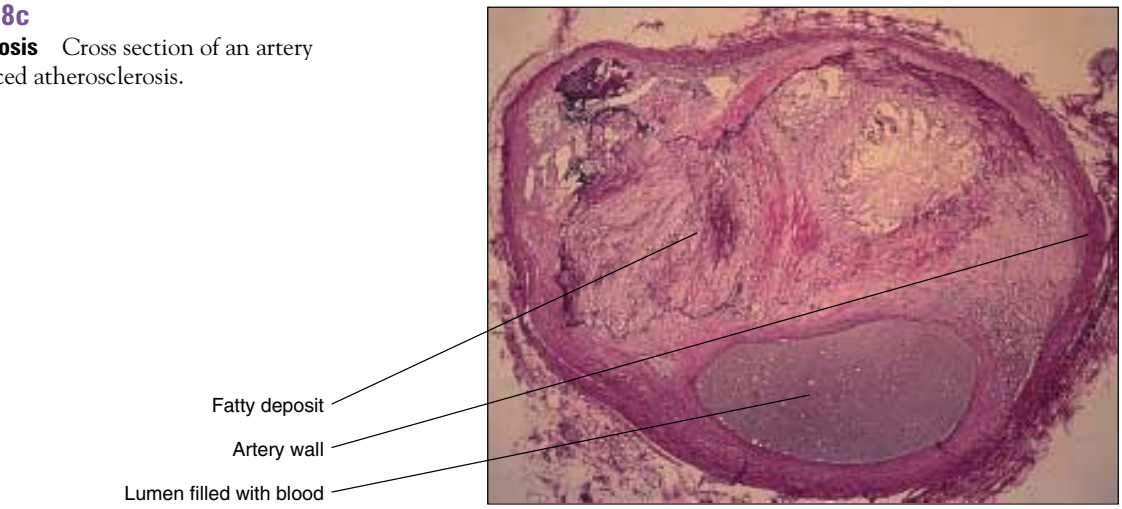


Figure 1-68c

Atherosclerosis Cross section of an artery with advanced atherosclerosis.



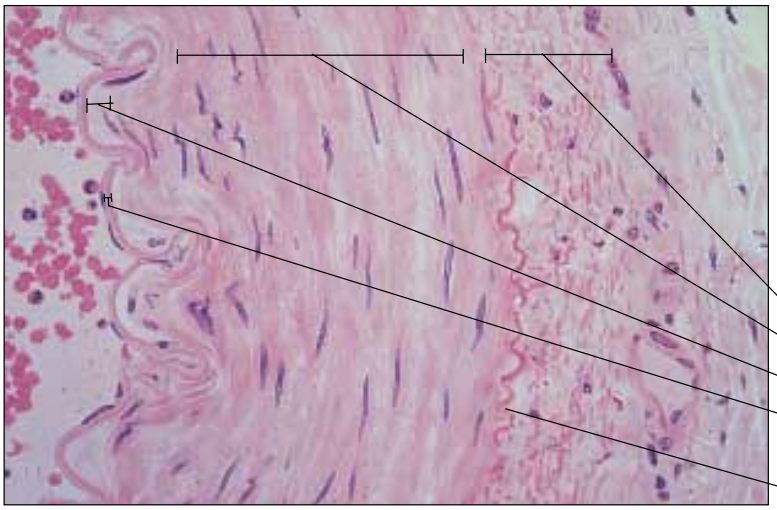


Figure 1-69
Detail of Arterial Wall Inner endothelial cells of tunica intima *(left)* lie on a basement membrane. A thin layer of smooth muscle cells and elastic tissue (lamina propria) throws this tunic into folds. The tunica media contains multiple layers of smooth muscle cells regularly arranged. A wavy external elastic membrane separates the tunica media from the adventitia.

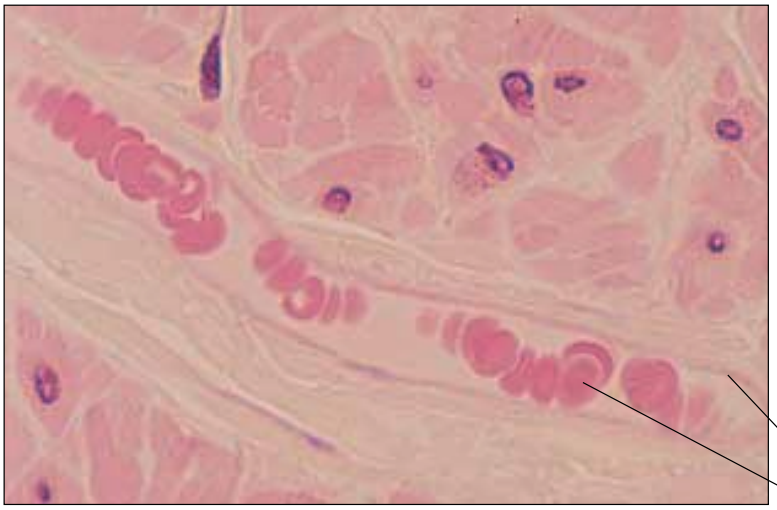


Figure 1-70
Capillary with Red Blood Cells in Single File Capillary wall is made of flattened endothelial cells without complex tunics, a simple structure that facilitates the exchange of gases, nutrients, wastes, and hormones. (×400)

Figure 1-71
Lymph Node Outer cortex containing several follicles surrounds medulla, with its narrow, dark medullary cords. Notch is hilum, through which blood and lymphatic vessels pass. (×5)

Figure 1-72

Valve of Lymphatic Vessel One-way flow of lymph, from left to right in this figure, is ensured by valve action in lymph vessel. Vessels themselves are thin walled and lack musculature; pumping action occurs through compression by neighboring muscles. (×25)

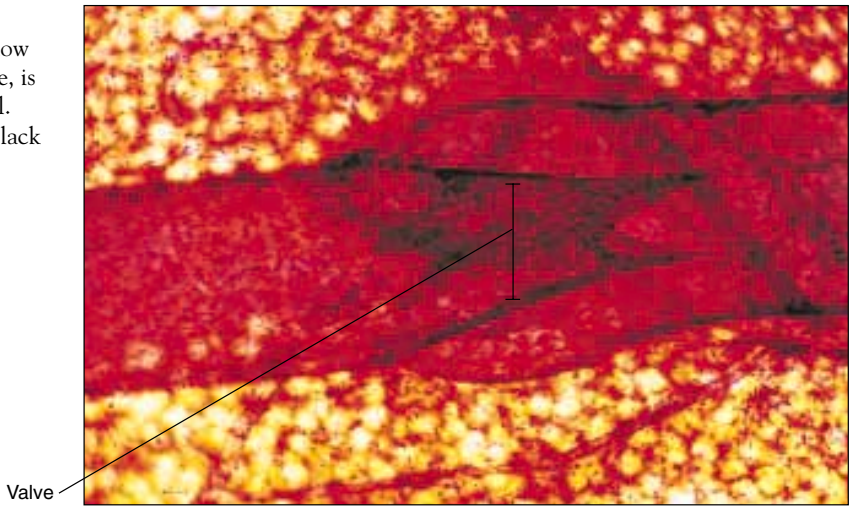


Figure 1-73a

Thymus Various lobules contain thick, darkly staining cortex surrounding a smaller, lighter-staining medulla. Small, round cellular patches in medulla are Hassall's corpuscles. In adults, much of thymus degenerates and is replaced by adipose tissue. (×10)

Figure 1-73b

Thymus Under higher magnification, the appearance of Hassall's corpuscles distinguish the thymus from other organs. Surrounding the corpuscles are reticulate epithelial cells. (×400)

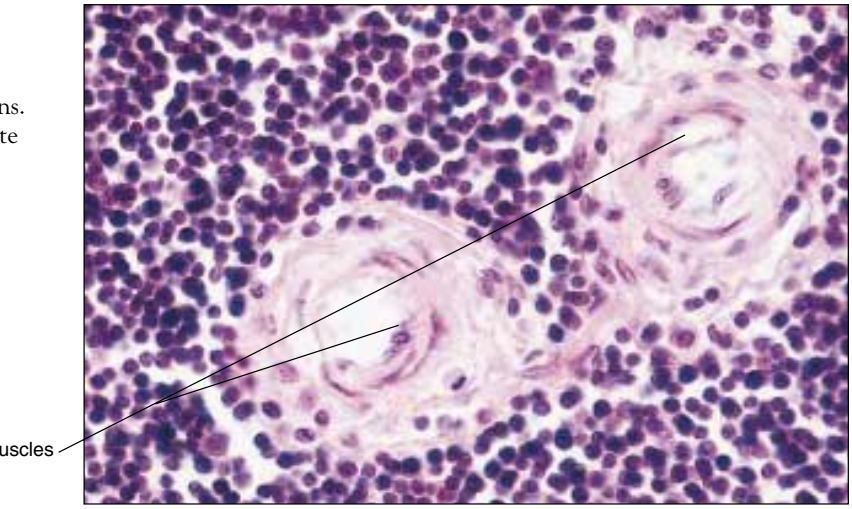


Figure 1-74
Palatine Tonsil Outer capsule surrounds subcapsular sinus, under which are several large, rounded germinal centers surrounding trabecular arteries and veins. Efferent lymph vessel leads out to upper left. (×5)

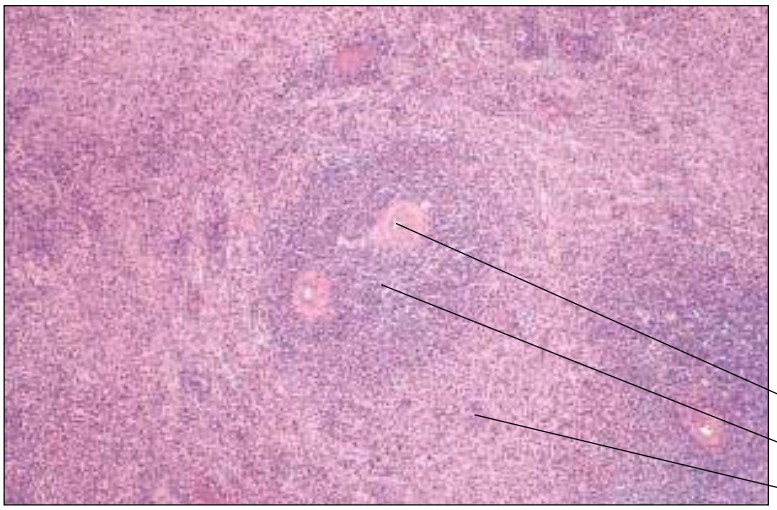


Figure 1-75
Spleen Central blood vessels are surrounded by area of densely staining white pulp composed of lymphoid cells. Less densely staining red pulp, with fewer cell nuclei, surrounds white pulp. (×25)

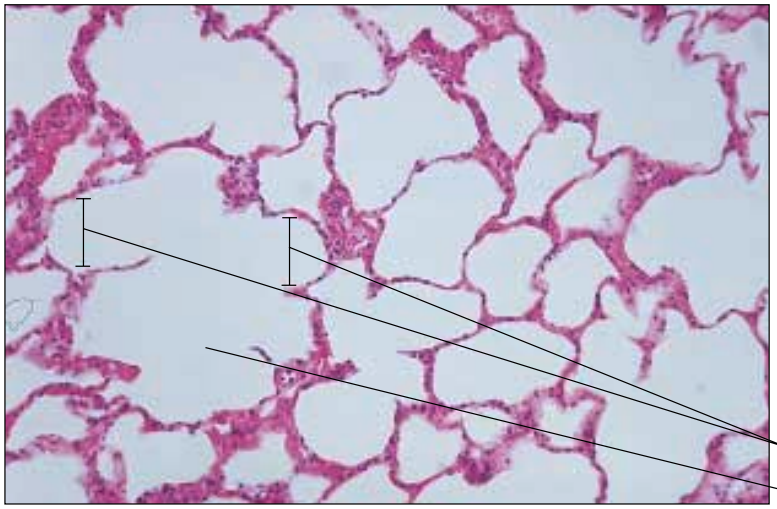


Figure 1-76
Alveoli Thin-walled respiratory exchange surfaces aid in rapid diffusion of gases. Bronchiole terminates at atrium, which acts as entryway into several individual alveolar sacs, greatly multiplying surface area. (×50)

Figure 1-77

Details of Alveolus Squamous cells compose alveolar sac, which is penetrated by thin-walled blood vessels ***(upper left)*** containing erythrocytes. (×100)

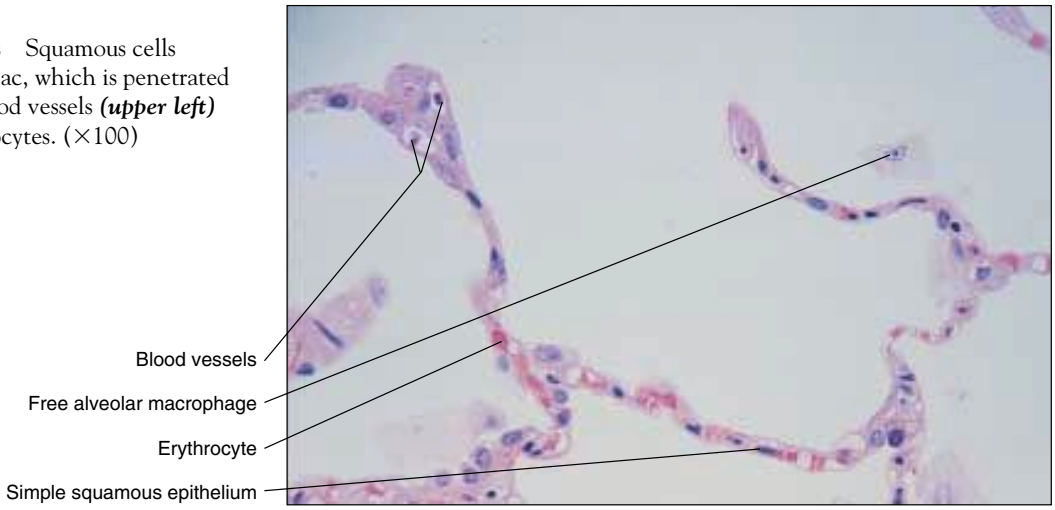


Figure 1-78

Bronchiole Epithelial layer that lines the lumen is surrounded by layer of smooth muscle, which regulates bronchiolar diameter. Round structures outside of smooth muscle layer are blood vessels. (×100)

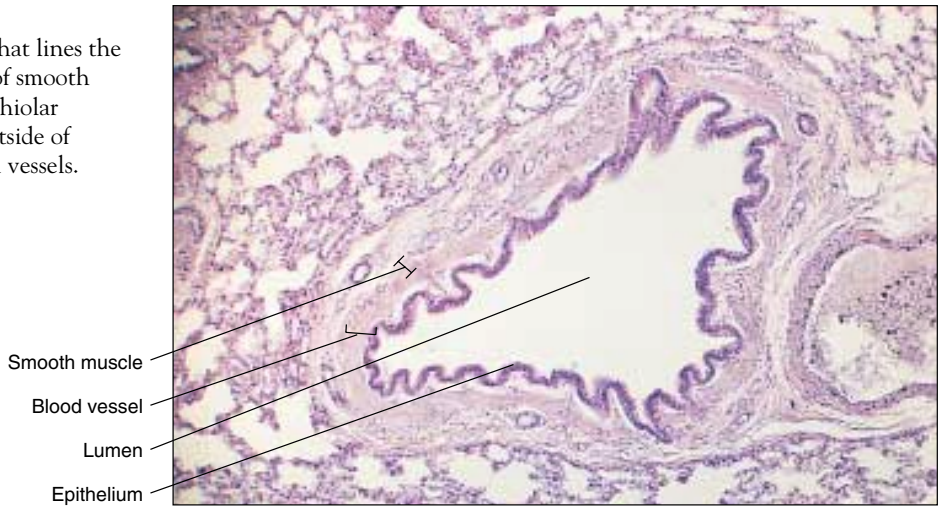


Figure 1-79

Esophagus Surrounding the lumen, esophageal structure contains, in order, the four basic layers of the alimentary canal: **mucosa** (composed of epithelium, the thick lamina propria, and dark muscularis), **submucosa** (light with spaces, blood vessels, and lymph channels), two thick layers of the **muscularis** (circular and longitudinal), and the thin, connective **adventitia** on the surface. Cross section, human. (×3)

Figure 1-80a
Stomach Mucosa Visible at entrances to gastric pits are mucus-secreting goblet cells of columnar epithelium. Deeper in pits are acid-secreting parietal cells and enzyme-secreting chief cells. Endocrine-secreting cells near tip of pits are noncolumnar and smaller, with dark, round nuclei. Gastric pits penetrate deep into submucosal layer. Edge of muscularis layer is visible. (×50)

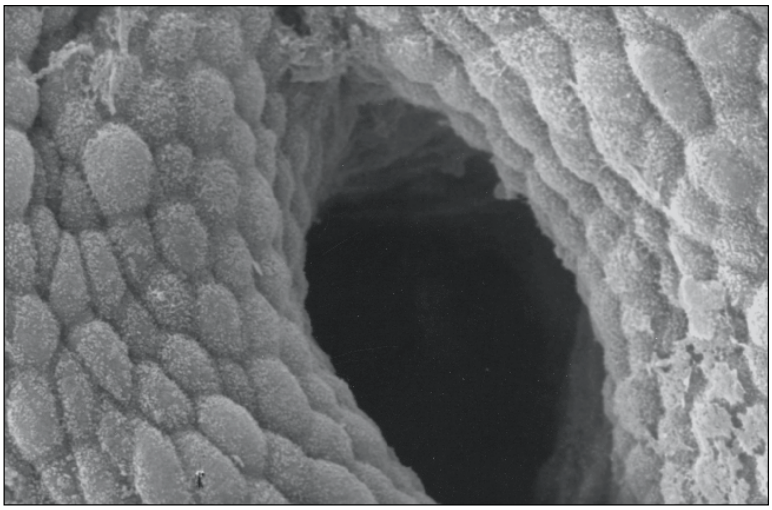


Figure 1-80b
Gastric Pit The opening of a gastric pit into the stomach, surrounded by the rounded apical surfaces of the columnar epithelial cells of the mucosa.

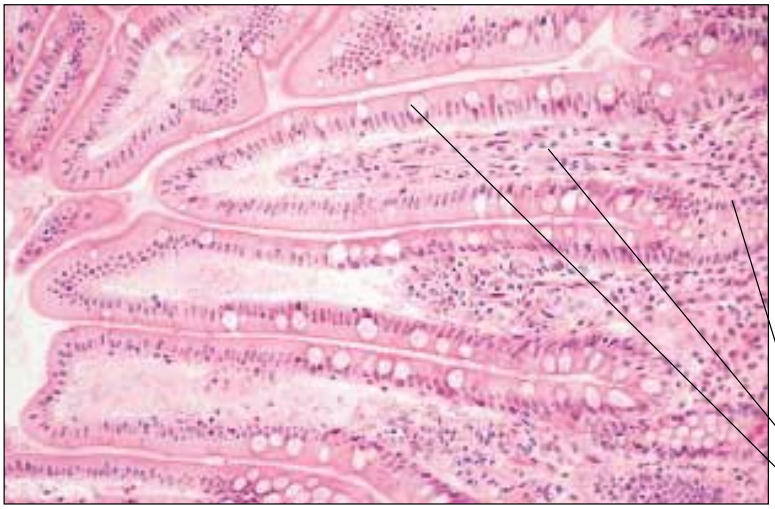


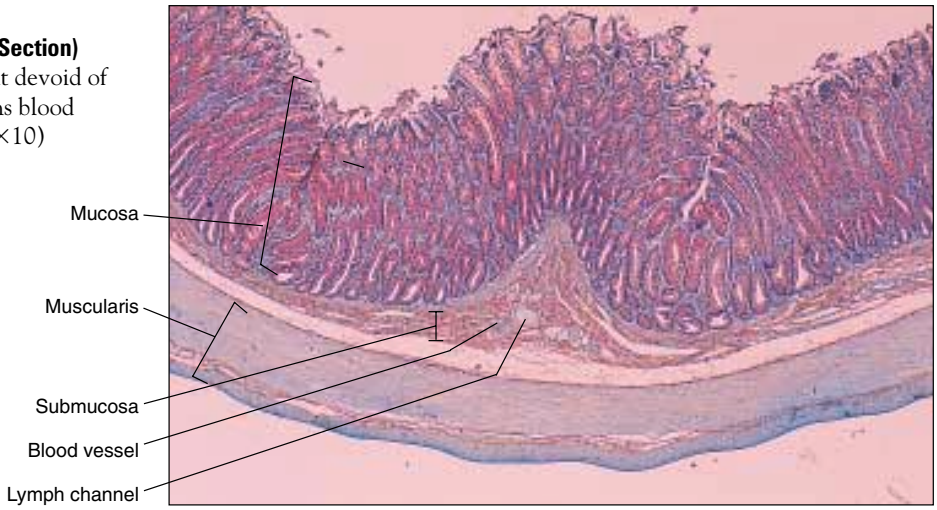
Figure 1-81
Small Intestine, Villi of Ileum (Longitudinal Section) Numerous pale goblet cells punctuate columnar epithelium that covers each villus. Core of villus contains small blood vessels and blind lymph channel (lacteal). Deep in crypts are endocrine cells, identifiable as dark, round nuclei in a noncolumnar cytoplasm. Human. (×50)

Figure 1-82

Small Intestine, Villi of Ileum (Cross Section)
Goblet cells emptying contents through brush border surface are evident. Core of villus contains blood vessels, lymph channels, and lymphocytes. Human. (×100)

Figure 1-83

Large Intestine (Colon) (Cross Section)
Surface is thrown into folds but devoid of villi. Thick submucosa contains blood vessels and lymph channels. (×10)



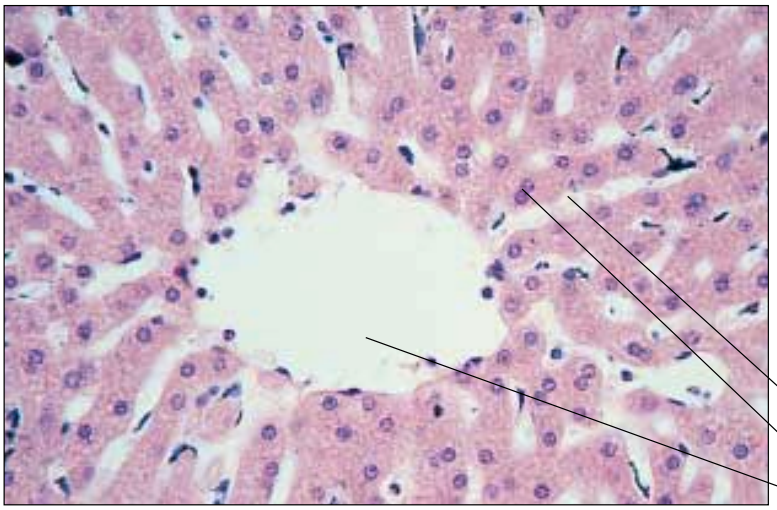


Figure 1-84a

Liver with Central Vein and Sinusoids
Parenchymal hepatocytes lie in radial arrangement around central vein that is lined with single endothelial layer. Cords of hepatocytes are separated by spaces (sinusoids). Sinusoidal surface is covered by microvilli. (×100)

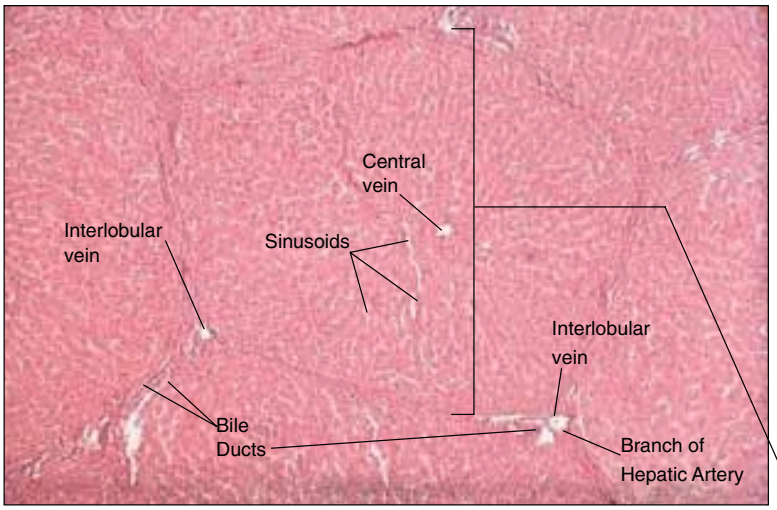


Figure 1-84b

Liver The liver consists of numerous lobules. A single lobule is in the center of view. At the junction of three adjacent lobes is a bile duct, a branch of the hepatic artery, and a branch of the hepatic portal vein. These three tubes are called a triad. (×40)

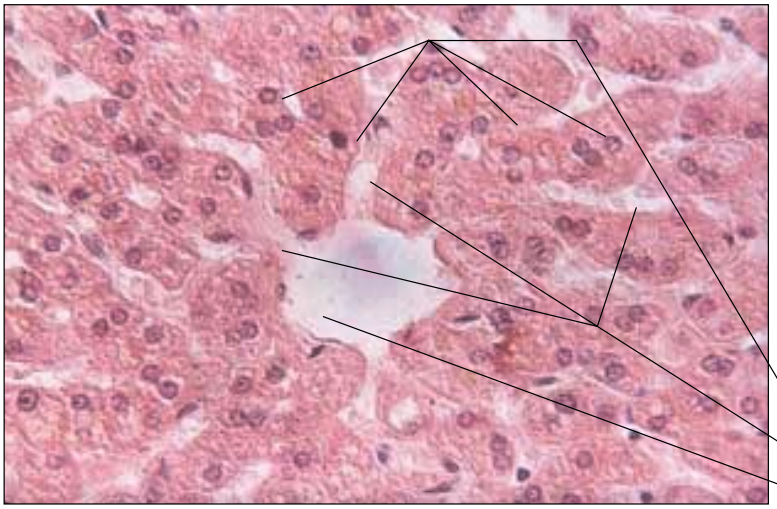


Figure 1-84c

Liver A single liver lobule consists of a central vein (shown in the center), which collects blood as it flows through narrow endothelial-lined channels, or sinusoids. The cells bordering the sinusoids are called hepatocytes. (×400)

Figure 1-85

Gallbladder Mucosal folds are covered by epithelium with well-developed microvilli. Lamina propria contains blood vessels. (×25)

Figure 1-86

Vermiform Appendix (Cross Section) Overall structure resembles that of colon. Large, darkly staining structures are lymphoid follicles, the size and number of which decrease with age. Human. (×3)

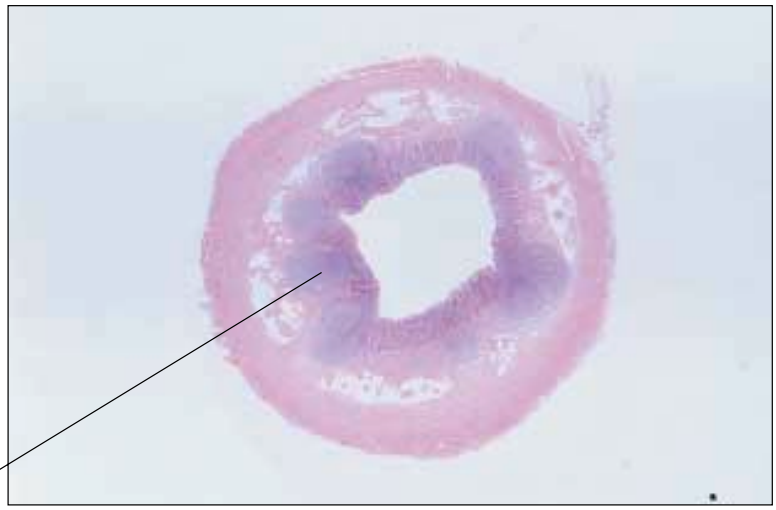
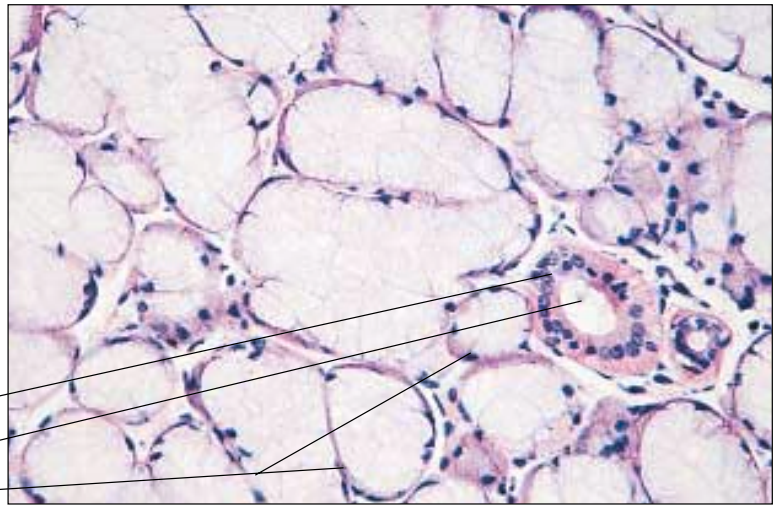


Figure 1-87

Sublingual Salivary Gland Large, pale, mucus-secreting cells, some with caps of serous demilunes, secrete their contents into ducts that may be lined with striated epithelial cells indicative of ion exchange activity. (×100)



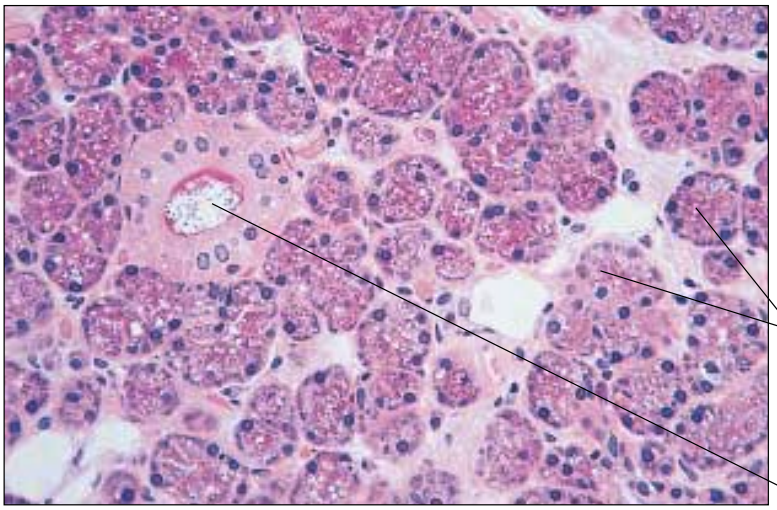


Figure 1-88
Parotid Salivary Gland Granular serous cells with numerous, large, zymogen granules surround duct. Several tiny ducts run between clusters within the plane of section. Human. (×100)

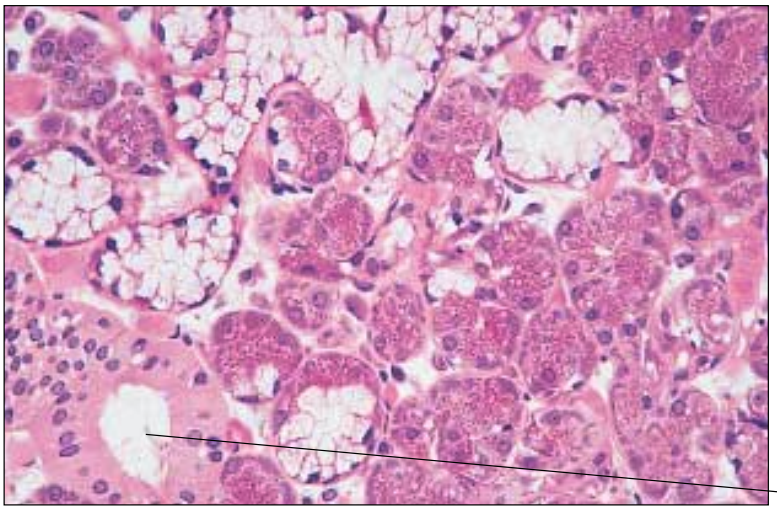


Figure 1-89
Submandibular Salivary Gland with Mucous (Light Staining) and Serous (Dark Staining) Components Striated duct is visible at lower left. (×100)

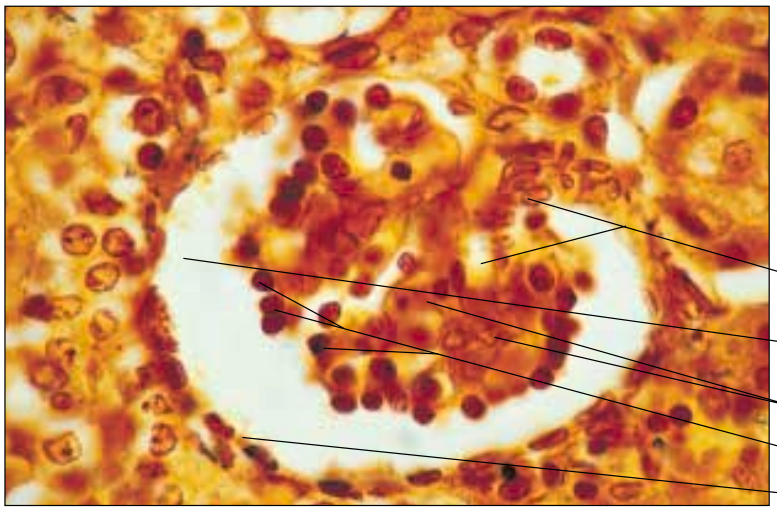


Figure 1-90
Bowman's Capsule and Glomerulus (Renal Corpuscle) Tuft of capillaries, surrounded by podocytes, protrudes into space of Bowman's capsule. Parietal surface is lined with single layer of simple squamous cells. (×100)

Figure 1-91
Two Glomeruli and Bowman's Capsules "Lacy" edges of glomerulus on left shows characteristics of pregnancy-induced hypertension (PIH), here induced experimentally in a pregnant rat. (×50)

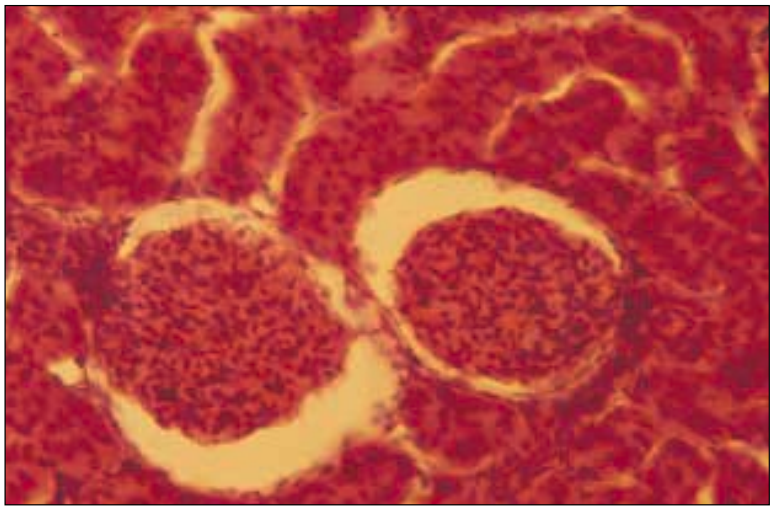


Figure 1-92
Distal Convoluted Tubules Lined with Cuboidal Epithelium Cross section of rat. (×400)

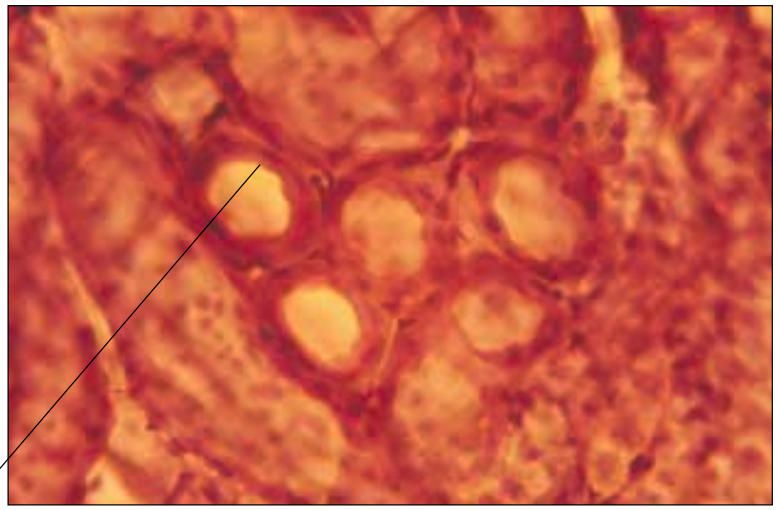


Figure 1-93
Ureter Star-shaped lumen is lined with transitional epithelium that varies in thickness to change shape as lumen stretches. Delicate lamina propria separates epithelium from alternating layers of circular and longitudinal smooth muscle. (×25)

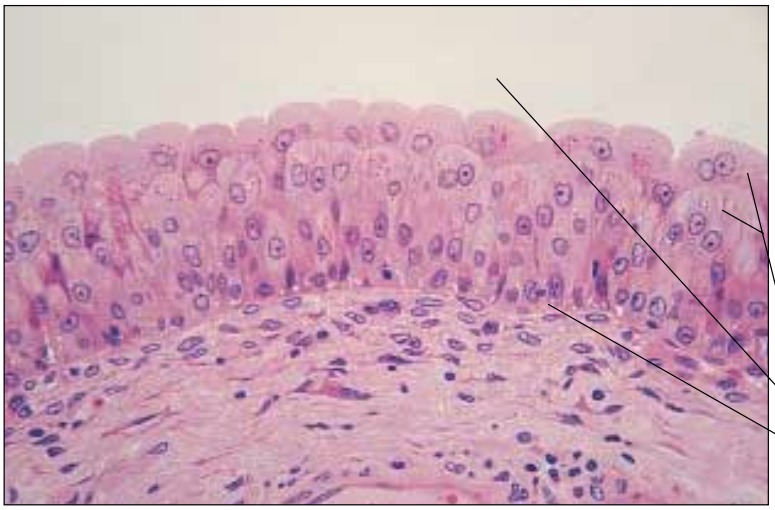


Figure 1-94
Urinary Bladder Umbrella cells of transitional epithelium stretch and flatten as bladder fills. Basement membrane separates epithelium from underlying connective tissue containing blood vessels. Monkey. (×100)

Figure 1-95
Urethra (within Penis) Lumen is lined with transitional epithelium and is embedded in corpus spongiosum of the penis. Paraurethral glands located above the lumen in the figure secrete mucus into the urethra. A smooth muscle layer (tunica muscularis) surrounds the urethral structures. (×10)

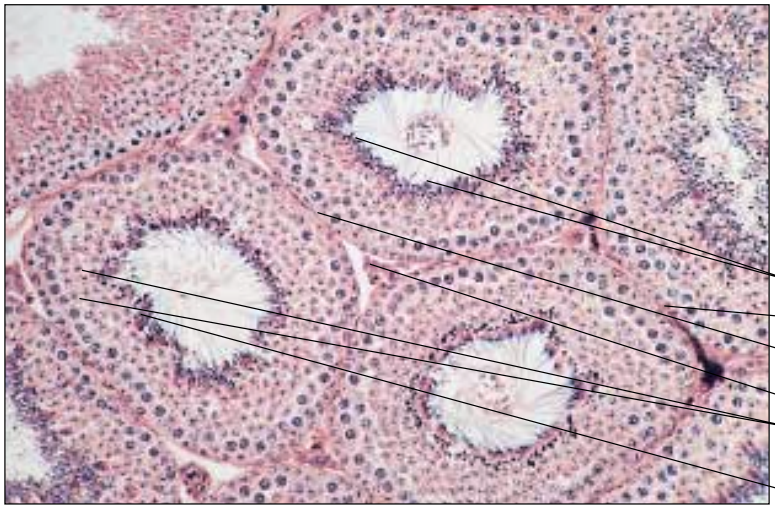


Figure 1-96
Seminiferous Tubules of Testis Lined with Sertoli Cells and Germinativum in Various Stages of Development Tunica propria surrounds each tubule. Interstitial spaces contain blood vessels and clumps of interstitial (Leydig) cells that secrete testosterone. (×50)

Figure 1-97

Spermatozoa Head contains numerous enzymes and nucleus with DNA. Thick midpiece just behind head is packed with mitochondria. (×250)

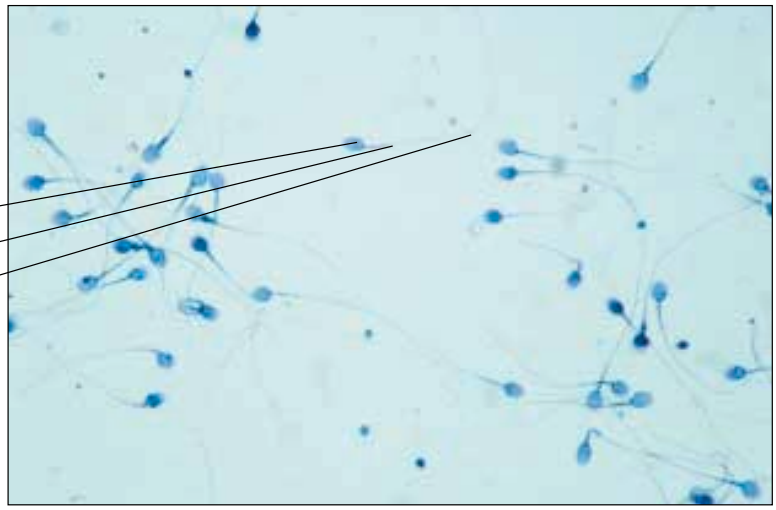


Figure 1-98

Epididymis Tall, pseudostratified columnar epithelium with microvilli surrounds a lumen packed with clumps of spermatozoa. Narrow band of smooth muscle cells encircles each tubule.

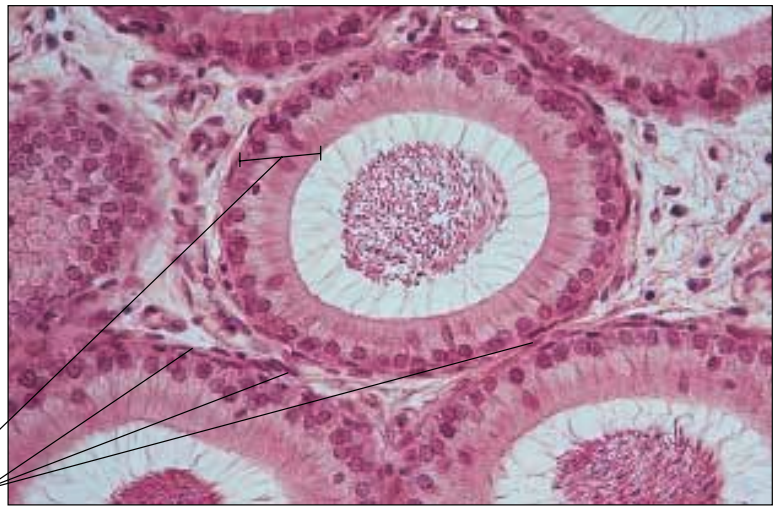


Figure 1-99

Ductus Deferens Ciliated columnar epithelial cells line a spermatozoa-filled lumen. Three layers of smooth muscle cells surround mucosa, a circular layer between two longitudinal ones. (×50)

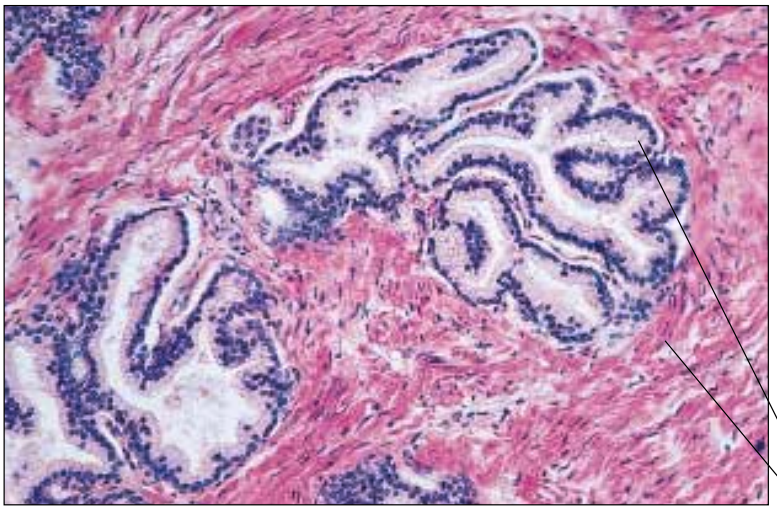


Figure 1-100

Prostate Gland Mucosal surfaces, lined with tall columnar cells and darkly stained basal nuclei, are arranged in numerous deep folds. Lumina open directly into prostatic urethra. Smooth muscle and fibrocollagenous stroma surround luminal structures. Human. (×50)

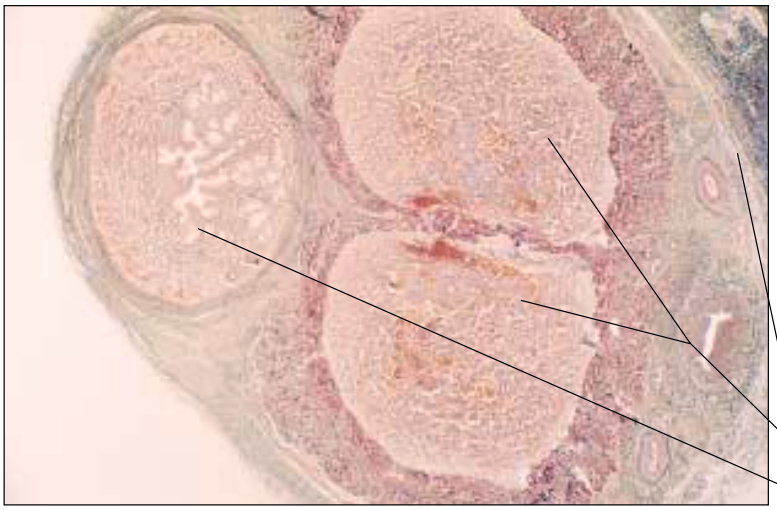


Figure 1-101

Penis Two corpora cavernosa lie superior to single corpus spongiosum containing penile urethra. Septum between corpora cavernosa is incomplete. Dense fibrous connective tissue, tunica albuginea, surrounds the three vascular cavernosa. The inferior aspect appears on the left, the superior aspect on the right. (×5)

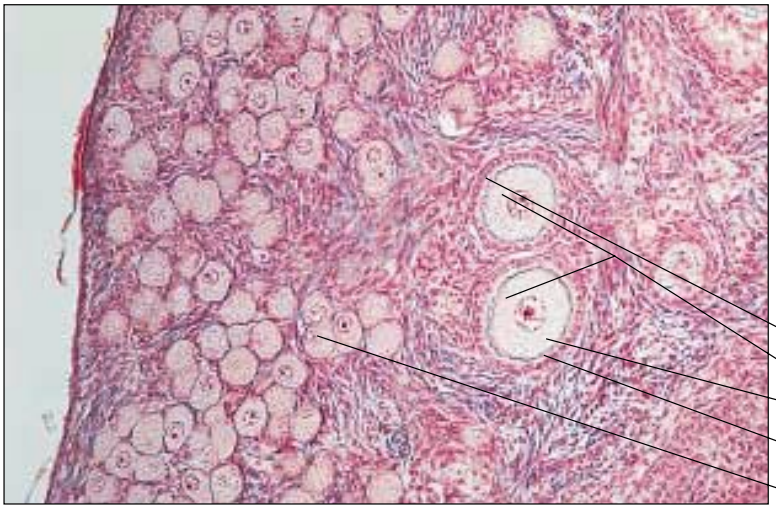


Figure 1-102

Ovary with Numerous Primordial Follicles and Two Primary Follicles Primordial follicles contain oocytes that are not stimulated to complete the first meiotic division. Two primary follicles each contain an ovum with nucleus and clear surrounding cytoplasm. Thin, clear **zona pellucida** is surrounded by a ring of even cuboidal cells, the **corona radiata.** (×25)

Figure 1-103

Detail of Oocyte in Primordial Follicle
Clear nucleus contains well-defined nucleolus. Neither zona pellucida nor corona radiata is evident. (×250)

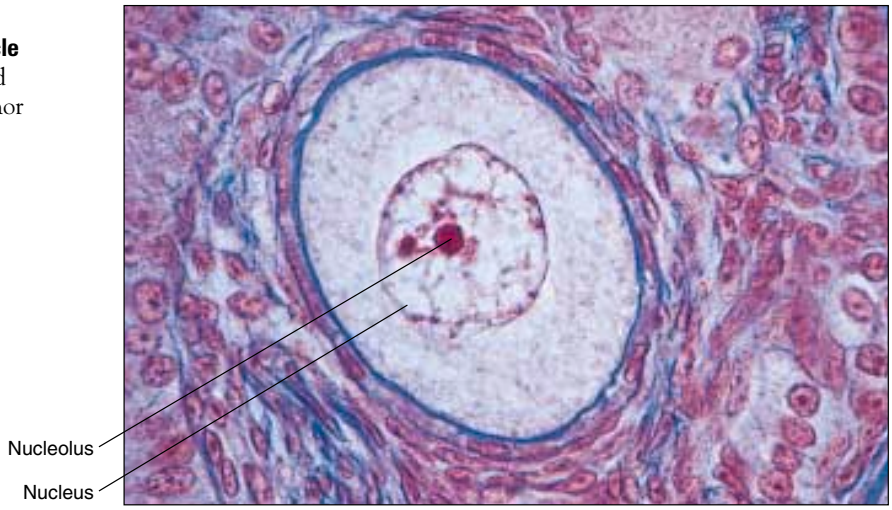
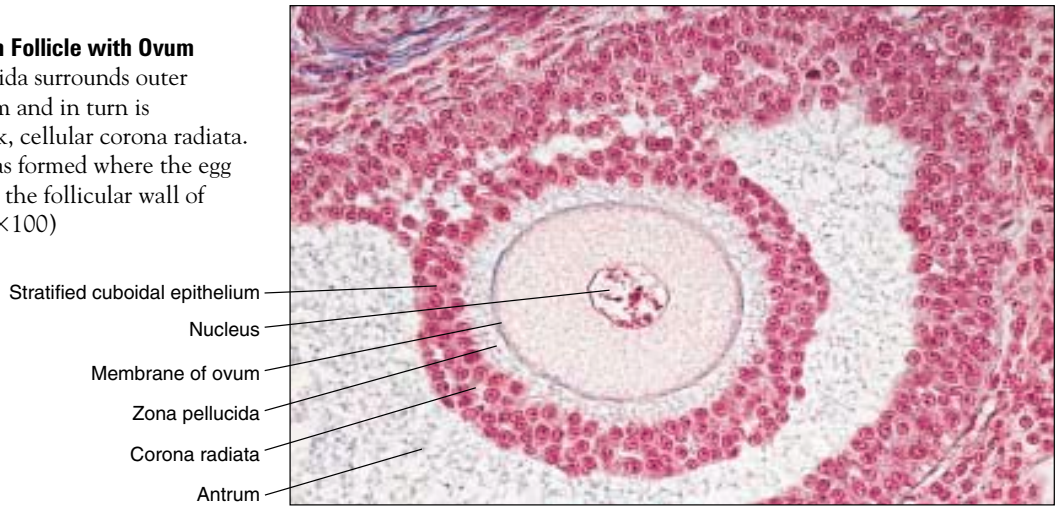


Figure 1-104

Secondary Ovarian Follicle with Ovum
Bright zona pellucida surrounds outer membrane of ovum and in turn is surrounded by dark, cellular corona radiata. A large **antrum** has formed where the egg is not anchored to the follicular wall of **granulosa cells.** (×100)



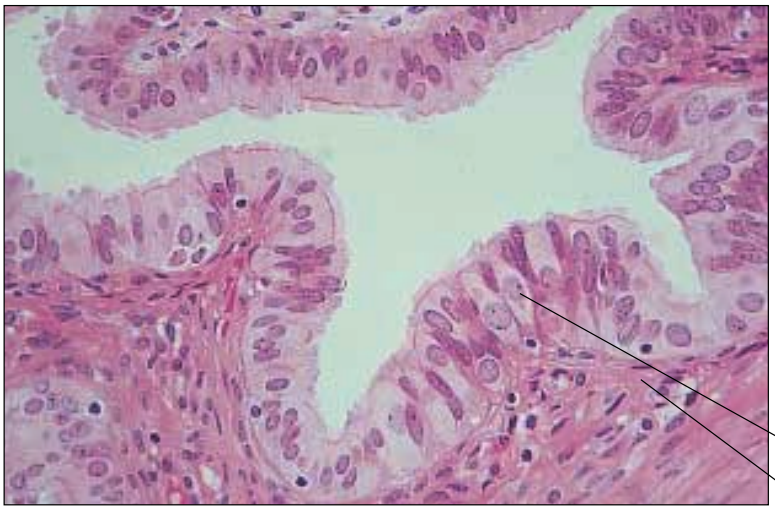


Figure 1-105

Fallopian (Uterine) Tube Extensive folding of mucosa, lined with ciliated columnar epithelium, is common. Epithelium rests on thin basement membrane and flat connective tissue layer. Rhythmic beating of cilia helps transport ovum toward uterus; cell structure also suggests secretory function. Human. (×100)

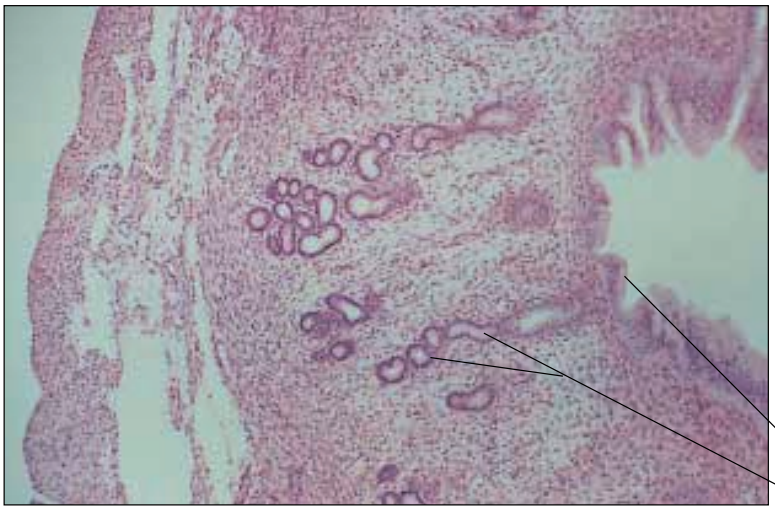


Figure 1-106

Uterus Endometrial lining *(right)* during proliferative phase of uterine cycle shows thickening of epithelial surfaces and numerous coiled glandular ducts. (×25)