

# Glossary

Pronunciations in the text and this glossary use the following rules:

1. Accent marks follow stressed syllables. The primary stress is shown by ', and the secondary stress by ''.
2. Unless otherwise noted, assume that vowels at the ends of syllables are long and vowels followed by consonants are short. Exceptions to this rule are indicated by a bar (̄) over the vowel, which indicates a long vowel, or a breve sign (˘) over the vowel, indicating that the vowel is short.

For example, the phonetic spelling of “thrombophlebitis” is *thromˈbo-flē-bi-tis*. The next-to-last syllable (*bi*) receives the greatest stress, and the first syllable (*throm*) gets the secondary stress. The vowel in the second syllable comes at the end of the syllable and is long. The vowel that comes at the end of the third syllable is short because it has a breve sign.

**Abdominal** *ab-domˈīnəl* pertaining to the anterior body trunk inferior to the ribs.

**Accommodation** (1) adaptation in response to differences or changing needs; (2) adjustment of the eye for seeing objects at close range.

**Acetylcholine (ACh)** *aˈse-til-koˈlēn* a chemical transmitter substance released by certain nerve endings.

**Acid** a substance that liberates hydrogen ions when in an aqueous solution; proton donor; compare with *base*.

**Acid-base balance** the maintenance of proper pH in the body; involves buffers, the respiratory system, and the kidneys.

**Acidosis** *asˈi-doˈsis* a condition in which the blood has an excess hydrogen ion concentration and a decreased pH; also called *ketoacidosis*.

**Acquired immune deficiency syndrome (AIDS)** immunodeficiency caused by human immunodeficiency virus (HIV) attacking T cells; symptoms include severe weight loss, night sweats, swollen lymph nodes, and opportunistic infections.

**Acromial** *ab-kroˈme-ul* pertaining to the point of the shoulder.

**Acrosome** *akˈro-sōm* an enzyme-containing structure covering the nucleus of the sperm.

**Actin** *akˈtin* one of the principal contractile proteins found in muscle; makes up the thin filaments.

**Action potential** an electrical event occurring when a stimulus of sufficient intensity is applied to a neuron or muscle cell, allowing sodium ions to move into the cell and reverse the polarity.

**Active immunity** immunity produced by an encounter with an antigen; provides immunological memory.

**Active site** region on the surface of a globular protein (such as an enzyme) where it interacts with other molecules of complementary shape and charge (such as substrate).

**Active transport** net movement of a substance across a membrane against a concentration or electrical gradient; requires release and use of cellular energy.

**Adaptive defense system** branch of the immune system that targets specific antigen; involves B and T lymphocytes and antigen-presenting cells; also called *specific defense system*.

**Adenosine triphosphate (ATP)** *ab-denˈo-sēn tri-fosˈfāt* the compound that is the important intracellular energy source; cellular energy.

**Adipose tissue** *adˈi-pōs* fat.

**Adrenal glands** *ab-dreˈnəl glanz* hormone-producing glands located superior to the kidneys; each consists of a medulla and a cortex.

**Aerobic respiration** respiration in which oxygen is consumed and glucose is broken down entirely; water, carbon dioxide, and large amounts of ATP are the final products.

**Afferent** *afer-ent* carrying to or toward a center.

**Agglutinins** *ab-glooˈtī-nīnz* antibodies in blood plasma that cause clumping of corpuscles or bacteria.

**Agglutinogens** *agˈloo-tinˈo-jēnz* (1) antigens that stimulate the formation of a specific agglutinin; (2) antigens found on red blood cells that are responsible for determining the ABO blood group classification.

**Albumin** *al-buˈmīn* a protein found in virtually all animals; the most abundant plasma protein.

**Alkalosis** *alˈkab-lōˈsis* a condition in which the blood has a lower hydrogen ion concentration than normal and an increased pH.

**Allergy** *alˈer-je* overzealous immune response to an otherwise harmless antigen, resulting in tissue damage; also called *hypersensitivity*.

**Alveolus** *al-veˈo-lus* (1) a general term referring to a small cavity or depression; (2) an air sac in the lungs.

**Amino acid** *ab-meˈno* an organic compound containing nitrogen, carbon, hydrogen, and oxygen; the building block of protein.

**Amphiarthrosis** *amˈfe-ar-throˈsis* a slightly movable joint.

**Anabolism** *ab-nabˈo-līzm* the energy-requiring building phase of metabolism in which simpler substances are combined to form more complex substances.

**Anaerobic glycolysis** *an-aˈer-ōb-ik* a process in which glucose is broken down in the absence of oxygen, resulting in the formation of 2 ATP molecules and lactic acid.

**Anatomical position** reference point for regional and directional terminology; standing, feet parallel, palms facing forward.

**Anatomy** the science of the structure of living organisms.

**Anemia** *ab-neˈme-ab* reduced oxygen-carrying capacity of the blood caused by a decreased number of erythrocytes or decreased percentage of hemoglobin in the blood.

**Antebrachial** *anˈte-braˈke-ul* pertaining to the forearm.

**Antecubital** anterior surface of the elbow.

**Antibody** *anˈtī-bodˈe* a specialized substance produced by the body that can provide immunity against a specific antigen.

**Antigen (Ag)** *anˈtī-jen* any substance—including toxins, foreign proteins, or bacteria—that, when introduced to the body, is recognized as foreign and activates the immune system.

**Antigen-presenting cells (APCs)** cells that display portions of foreign antigens to T cells; include dendritic cells, macrophages, and B lymphocytes.

**Antimicrobial proteins** defensive proteins that assist the innate defenses by attacking microbes directly or by preventing their reproduction; see *complement* and *interferon*.

**Aorta** *a-orˈtab* the major systemic artery; arises from the left ventricle of the heart.

**Apocrine gland** *apˈo-krīn* the less numerous type of sweat gland. Its secretions contain water, salts, fatty acids, and proteins.

**Aponeurosis** *apˈo-nu-roˈsis* fibrous or membranous sheet connecting a muscle and the part it moves.

**Appendicular skeleton** *apˈen-dīkˈu-lar* bones of the limbs and limb girdles that are attached to the axial skeleton.

**Aqueous humor** *aˈkwe-us huˈmer* the watery fluid in the anterior chambers of the eye.

**Arachnoid granulation** special projections of the arachnoid mater that protrude through the dura mater; site of cerebrospinal fluid absorption into the dural venous sinuses.

**Arachnoid mater** middle layer of the meninges; has weblike extensions attach to the inner layer, the pia mater.

**Arrector pili** *ab-rekˈtor piˈli* tiny, smooth muscles attached to hair follicles; when activated, they cause the hair to stand upright.

**Arteriole** *ar-terˈe-ōl* minute artery.

**Arteriosclerosis** *ar-tērˈe-o-skler-oˈsis* any of a number of proliferative and degenerative changes in the arteries leading to their decreased elasticity and hardening; end stage of atherosclerosis.

**Artery** a vessel that carries blood away from the heart.

**Arthritis** *ar-thriˈtis* inflammation of the joints.

**Articular cartilage** hyaline cartilage covering the epiphysis of a bone at a joint.

**Asthma** *az'mab* disease or allergic response characterized by bronchial spasms and difficult breathing.

**Astigmatism** *ab-stig'mab-tizm* a visual defect resulting from irregularity in the lens or cornea of the eye causing the image to be out of focus.

**Astrocyte** *as'tro-sit* type of CNS supporting cell; assists in exchanges between blood capillaries and neurons.

**Atherosclerosis** *d'ther-o'skler-o'sis* changes in the walls of large arteries consisting of lipid deposits on the artery walls; the early stage of arteriosclerosis and increased rigidity.

**Atlas** the first cervical vertebra; articulates with the occipital bone of the skull and the second cervical vertebra (axis).

**Atom** *at'um* the smallest part of an element; indivisible by ordinary chemical means.

**Atomic mass number** the sum of the number of protons and neutrons in the nucleus of an atom; also known as *mass number*.

**Atomic number** the number of protons in an atom.

**Atomic symbol** a one- or two-letter symbol indicating a particular element.

**Atrioventricular (AV) node** *d'tre-o-ven-trik'u-lar* a specialized mass of conducting cells located at the atrioventricular junction in the heart.

**Atrioventricular (AV) valves** two valves set between the atria and ventricles to prevent backflow; includes the mitral (bicuspid) on the left and the tricuspid on the right.

**Atrium** *d'tre-um* a chamber of the heart receiving blood from the veins; superior heart chamber.

**Atrophy** *at'ro-fe* a reduction in size or wasting away of an organ or cell resulting from disease or lack of use.

**Auricle** the external part of the ear surrounding the auditory canal; also called *pinna*.

**Autonomic nervous system** the division of the nervous system that functions involuntarily; innervates cardiac muscle, smooth muscle, and glands; also called *involuntary nervous system*.

**Axial skeleton** *ak'se-al* the skull, vertebral column, ribs, and sternum.

**Axilla** *ak-sib'lab* armpit; pertaining to axillary region.

**Axis** (1) the second cervical vertebra; has a vertical projection called the dens around which the atlas rotates; (2) the imaginary line about which a joint or structure revolves.

**Axon** *ak'son* neuron process that carries impulses away from the nerve cell body; efferent process; the conducting portion of a nerve cell.

**Axon terminal** one of multiple ends of the axon that branch from the motor neuron axon; interacts with the sarcolemma of different muscle cells to form neuromuscular junctions.

**B cells** lymphocytes that oversee humoral immunity; their descendants differentiate into antibody-producing plasma cells; also called *B lymphocytes*.

**Ball-and-socket joint** multiaxial synovial joint in which the rounded head of one bone fits into a socket (depression) on the other.

**Basal metabolic rate (BMR)** *mel'ab-bol'ik* the rate at which energy is expended (heat produced) by the body per unit time under controlled (basal) conditions: 12 hours after a meal, at rest.

**Basal nuclei** *nu'kle-i* gray matter areas deep within the white matter of the cerebral hemispheres; also called *basal ganglia*.

**Base** (1) a substance that accepts hydrogen ions; proton acceptor; compare with *acid*; (2) the broad, posterosuperior aspect of the heart where large vessels enter or leave the heart; (3) the broad inferior area of each lung resting on the diaphragm.

**Basement membrane** a thin layer of extracellular material to which epithelial cells are attached in mucosa surfaces.

**Basilar membrane** the membrane in the cochlear duct that vibrates to transmit sound waves and also houses the receptor cells for hearing.

**Basophils** *ba'so-filz* white blood cells whose granules stain deep blue with basic dye; have a relatively pale nucleus and granular-appearing cytoplasm.

**Benign** *be-nin'* not malignant.

**Bicarbonate buffer system** system composed of bicarbonate ion ( $\text{HCO}_3^-$ ) and its salt, sodium bicarbonate ( $\text{NaHCO}_3$ ), that resists changes in blood pH.

**Bile** a greenish yellow or brownish fluid produced in and secreted by the liver, stored in the gallbladder, and released into the small intestine.

**Blind spot** gap in vision caused by a lack of photoreceptors at the optic disc.

**Blood** liquid connective tissue composed of plasma and cells responsible for transporting substances such as nutrients and oxygen around the body.

**Blood pressure** the pressure exerted by blood against the inner walls of blood vessels.

**Blood sugar** the amount of glucose in the blood.

**Bone markings** surface features of bones where muscles, tendons, and ligaments attach, and where blood vessels and nerves pass.

**Bone remodeling** the process of repairing or maintaining bone by adding or removing bone matrix in response to damage or mechanical stress.

**Bony callus** "splint" of spongy bone that replaces fibrocartilage callus during bone remodeling.

**Bony thorax** *bōn'e tho'raks* bones of the thorax, including ribs, sternum, and thoracic vertebrae; also called *thoracic cage*.

**Brachial** *bra'ke-al* pertaining to the arm.

**Bradycardia** *brad'e-kar'de-ab* slow heart rate, usually defined as a rate under 60 beats per minute.

**Brain stem** the portion of the brain consisting of the medulla, pons, and midbrain.

**Broad ligament** large ligament formed by a fold of peritoneum that encloses the ovaries and holds them in place, and suspends the uterus from the pelvis.

**Bronchioles** *brong'ke-ōlz* the smallest conducting passages in the lungs.

**Buccal** *buk'al* pertaining to the cheek.

**Buffer** a substance or substances that help to stabilize the pH of a solution.

**Bulbourethral glands** tiny glands inferior to the prostate that produce clear mucus that neutralizes urine prior to ejaculation.

**Burn** tissue damage resulting in cell death caused by electricity, chemicals, too much heat or UV radiation. Burns vary in degree of severity. See *rule of nines*.

**Bursa** *ber'sab* a small sac filled with fluid and located at friction points, especially joints.

**Calcaneal** *kal-ka'ne-ul* pertaining to the heel of the foot.

**Calyx** *ka'liks* a cuplike extension of the pelvis of the kidney.

**Canaliculus** *kan'ab-lik'u-lus* extremely small tubular passage or channel.

**Cancer** a malignant, invasive cellular neoplasm that has the capability of spreading throughout the body or body parts.

**Carbohydrate** *kar'bo-hi'drāt* organic compound composed of carbon, hydrogen, and oxygen; includes starches, sugars, cellulose.

**Cardiac cycle** sequence of events encompassing one complete contraction and relaxation of the atria and ventricles of the heart.

**Cardiac muscle** specialized muscle of the heart with striations and intercalated discs; involuntary muscle.

**Cardiac output (CO)** the blood volume (in liters) ejected per minute by each ventricle.

**Cardiac veins** veins that drain the myocardium and empty into the coronary sinus.

**Cardiovascular system** organ system that distributes blood to all parts of the body.

**Carpal** *kar'pal* (1) one of the eight bones of the wrist; (2) pertaining to the wrist.

**Cartilage** *kar'ti-lij* white, semiopaque connective tissue.

**Cartilaginous joint** *kar'ti-laj'i-nus* bones united by cartilage; no joint cavity is present.

**Catabolism** *kab-tab'o-lizm* the process in which living cells break down substances into simpler substances; destructive metabolism.

**Catalyst** *kat'ab-list* substance that increases the rate of a chemical reaction without itself becoming chemically changed or part of the product; see *enzyme*.

**Cataract** *kat'ab-rakt* partial or complete loss of transparency of the crystalline lens of the eye.

**Catecholamines** *kat'ē-kol'ab-mēnz* epinephrine and norepinephrine.

**Cauda equina** *kaw'da e-kwi'nab* the collection of spinal nerves at the inferior end of the vertebral canal.

**Cell** the basic biological unit of living organisms, enclosed by a limiting membrane; cells in more complex organisms contain a nucleus and a variety of organelles.

**Cell body** the part of a neuron containing the nucleus; the metabolic center of a neuron.

**Cell division** the phase of a cell's life cycle when it reproduces itself.

**Cellular immunity** *sel'u-lar ĭ-mu'ni-te* immunity conferred by lymphocytes called T cells; also called *cell-mediated immunity*.

**Central nervous system (CNS)** the brain and the spinal cord.

**Centriole** *sen'tre-ol* a minute body found near the nucleus of the cell composed of microtubules; active in cell division.

**Centromere** *sen'tro-mear* button-like body holding sister chromatids together; also, the site of attachment to the mitotic spindle.

**Cephalic** *seb-fā'lik* pertaining to the head.

**Cerebellum** *ser'e-bel'um* part of the hind-brain; involved in producing smoothly coordinated skeletal muscle activity.

**Cerebral cortex** *sē-re'bral* outer gray matter of the cerebrum.

**Cerebral white matter** area of the cerebrum deep to the cerebral cortex containing fiber tracts carrying impulses to, from, or within the cortex.

**Cerebrospinal fluid (CSF)** the fluid produced by choroid plexuses; fills the ventricles and surrounds the central nervous system.

**Cerebrovascular accident (CVA)** a condition in which brain tissue is deprived of a blood supply, as in blockage of a cerebral blood vessel; also called a *stroke*.

**Cerebrum** *sē-re'brum* the largest part of the brain; consists of right and left cerebral hemispheres.

**Cerumen** *sē-roo'men* earwax.

**Cervical** *ser'vi-kal* term referring to the neck or the necklike portion of an organ or structure.

**Cervical cancer** uncontrolled cellular growth in the cervix that is almost always associated with one or more strains of human papilloma virus (HPV).

**Cervical vertebrae** the seven vertebrae of the neck region.

**Cervix** *ser'viks* the inferior necklike portion of the uterus leading to the vagina.

**Chemical bond** an energy relationship holding atoms together; involves the interaction of electrons.

**Chemical reaction** process in which molecules are formed, changed, or broken down.

**Chemoreceptors** *ke'mo-re-sep'terz* receptors sensitive to various chemicals in solution.

**Chief cells** cells of the gastric glands that secrete inactive pepsinogen.

**Cholesterol** *ko-les'ter-ol* a steroid found in animal fats as well as in most body tissues; made by the liver.

**Chordae tendineae** tendinous chords that anchor the flaps of the closed AV valves to prevent inversion and backflow of blood.

**Chorionic villi** embryonic tissue projections that will combine with tissue of the uterine lining to form the placenta.

**Choroid** *ko'roid* the pigmented nutritive layer of the eye; part of the vascular layer.

**Choroid plexus** structure in each of the four brain ventricles that produces cerebrospinal fluid (CSF).

**Chromatid** *kro'mab-tid* one copy of the DNA after replication but before cell division; still paired with the other copy, together called *sister chromatids*, by a centromere.

**Chromatin** *kro'mab-tin* the structures in the nucleus that carry the hereditary factors (genes).

**Chromosome** *kro'ma-sōm* barlike body of tightly coiled chromatin; visible during cell division.

**Chyme** *kīm* the semifluid stomach contents consisting of partially digested food and gastric secretions.

**Cilia** *sil'e-ab* tiny, hairlike projections on cell surfaces that move in a wavelike manner.

**Ciliary body** *sil'e-er-e* smooth muscle of the vascular tunic of the eye that is connected to the lens by the ciliary zonule.

**Ciliary zonule** suspensory ligament that attaches the lens to the ciliary body in the anterior eye.

**Citric acid cycle** the aerobic pathway occurring within the mitochondria, in which energy is liberated during metabolism of carbohydrates, fats, and amino acids and CO<sub>2</sub> is produced.

**Clavicle** *klav'ī-kl* collar bone; part of the pectoral girdle that attaches medially to the manubrium and laterally to the scapula.

**Cleavage** *klēv'ij* an early embryonic phase consisting of rapid cell divisions without intervening growth periods.

**Cleavage furrow** indentation formed by a contractile ring of microfilaments; continues to contract until cytokinesis is complete and two daughter cells are formed. See *cytokinesis*.

**Clitoris** *kli'to-ris* a small, erectile structure in the female, homologous to the penis in the male.

**Clonal selection** *klō'nul* the process during which a B cell or T cell becomes sensitized through binding contact with an antigen.

**Clone** descendants of a single cell.

**Coccyx** *kok'siks* three to five fused bones forming the inferior section of the spine; tailbone.

**Cochlea** *kōk'le-ab* a cavity of the inner ear resembling a snail shell; houses the hearing receptor.

**Cochlear duct** the location of the spiral organ of Corti in the cochlea; contains endolymph.

**Codon** *ko'don* the three-base sequence on a messenger RNA molecule that provides the genetic information used in protein synthesis; codes for a given amino acid.

**Coenzymes** nonprotein molecules, such as vitamins, that are necessary for the function of some enzymes.

**Colon** the part of the large intestine between the cecum and the rectum.

**Common hepatic duct** the duct that drains bile from the liver.

**Compact bone** dense bone composed of osteons that makes up the outer layer of flat, short and irregular bones; major component of long bones.

**Complement** a group of plasma proteins that normally circulate in inactive forms; when activated by complement fixation, causes lysis of foreign cells and enhances phagocytosis and inflammation.

**Compound** substance composed of two or more different elements, the atoms of which are chemically united.

**Concentration gradient** a difference in amount of a substance between two areas.

**Conchae** *kong'ke* projections from the walls of the nasal cavity that increase air turbulence and the surface area of mucous membrane exposed to the air to aid in warming and moistening.

**Concussion** brain injury with reversible damage.

**Conducting zone structures** all respiratory passages that carry air to the terminal bronchioles and beyond.

**Conduction deafness** hearing loss due to interference in transmitting sound waves to the inner ear.

**Condylar joint** *kon'dī-ler* biaxial synovial joint in which the convex surface of one bone fits into the concave surface of another.

**Cones** one of the two types of photoreceptor cells in the retina of the eye. Provides for color vision.

**Conjunctiva** *kon'junkt-i'vab* the thin, protective mucous membrane lining the eyelids and covering the anterior surface of the eyeball.

**Connective tissue** a primary tissue; form and function vary extensively. Functions include support, storage, and protection.

**Control center** component of homeostatic control receiving sensory input and sending motor output.

**Contusion** brain injury in which the damage cannot be reversed.

**Convergence** *kon-ver'jens* turning toward a common point from different directions.

**Cornea** *kor'ne-ab* the transparent anterior portion of the eyeball.

**Coronal suture** interlocking joint formed at the intersection of the two parietal bones with the frontal bone; also called the *frontal suture*.

**Coronary arteries** arteries that branch off the aorta and supply the myocardium.

**Coronary sinus** enlarged vessel that receives blood from the cardiac veins and empties into the right atrium.

**Corpora quadrigemina** *cor'pora kwod''rī-jem'in-ub* four nuclei in the midbrain containing visual and hearing reflex centers.

**Corpus callosum** *kor'pus kab-lo'sum* large fiber tract of the cerebral white matter that connects the cerebral hemispheres.

**Corpus luteum** *kor'pus lu'te-um* structure formed by the ruptured follicle cells after ovulation; secretes estrogen and progesterone.

**Cortex** *kor'teks* the outer surface layer of an organ.

**Corticosteroids** hormones secreted by the adrenal cortex, including mineralocorticoids, glucocorticoids, and sex hormones.

**Covalent bond** *ko-va'lent* a bond involving the sharing of electrons between atoms.

**Coxal** pertaining to the hip.

**Cranial nerves** the 12 pairs of nerves that arise from the brain.

**Cranium** part of the skull that encloses and protects the brain.

**Creatine phosphate (CP)** *kre'ab-tēn fos'fāt* a compound that transfers a phosphate group to ADP to regenerate ATP in muscle fibers.

**Crista ampullaris** receptors in the ampullae of the semicircular canals that detect dynamic equilibrium.

**Cross bridge** the link formed when a myosin head binds to the corresponding binding site on actin during contraction.

**Crural** pertaining to the anterior leg; shin.

**Cryptorchidism** *krip-tor'kī-dizm* a developmental defect in which one or both testes fail to descend into the scrotum.

**Cupula** *ku'pu-lab* a domelike structure; in the cristae of the inner ear, a gel-like cap covering the "hairs" of receptor cells.

**Cushing's syndrome** *koosh'ingz sin'drōm* a disease produced by excess secretion of glucocorticoids (such as cortisol); characterized by adipose tissue accumulation, weight gain, and osteoporosis.

**Cutaneous membrane** the skin; composed of epidermal and dermal layers.

**Cyanosis** *sī'ab-no'sis* a bluish coloration of the mucous membranes and skin caused by deficient oxygenation of the blood.

**Cystic duct** duct that carries bile from the gallbladder.

**Cystitis** *sis-ti'tis* an inflammation of the urinary bladder.

**Cytokines** *si'to-kīnz* chemical messengers involved in immunity that enhance the immune and inflammatory responses.

**Cytokinesis** *sī'to-kī-ne'sis* division of cytoplasm that occurs after the cell nucleus has divided.

**Cytoplasm** *si'to-plazm* the substance of a cell other than that of the nucleus.

**Cytoskeleton** literally, cell skeleton; internal framework of proteins that determine cell shape. See *microtubules*, *intermediate filaments*, and *microfilaments*.

**Cytosol** *si'to-zol* the liquid component of cytoplasm containing water and solutes.

**Cytotoxic T cell** effector T cell that directly kills foreign cells; also called a *killer T cell*.

**Dead space volume** volume of air that never reaches the alveoli and does not participate in gas exchange.

**Decomposition reaction** a destructive chemical reaction in which complex substances are broken down into simpler ones.

**Defecation reflex** *def'ib-ka'shun* the elimination of the contents of the bowels (feces).

**Deglutition** *de'gloo-tish'un* the act of swallowing.

**Dehydration synthesis** process by which a larger molecule is synthesized from smaller ones by removal of a water molecule at each site of bond formation.

**Dendrites** *den'drīz* the branching extensions of neurons that carry electrical signals to the cell body; the receptive portion of a nerve cell.

**Deoxyribonucleic acid (DNA)** *de-ok'sī-rī'bo-nu-kle'ik* nucleic acid found in all living cells; carries the organism's hereditary information.

**Depolarization** *de-pō'lar-i-za'shun* the loss of a state of polarity; the loss of a negative charge inside the plasma membrane.

**Dermis** *der'mis* the deep layer of the skin; composed of dense, irregular connective tissue.

**Diabetes mellitus** *dī'ab-bē'tēz mel'ī-tus* a disease caused by deficient insulin release or inadequate responsiveness to insulin, leading to inability of the body cells to use carbohydrates at a normal rate.

**Diapedesis** *dī'ab-pē-de'sis* the passage of blood cells through intact vessel walls into the tissues.

**Diaphragm** *dī'ab-fram* (1) any partition or wall separating one area from another; (2) a muscle that separates the thoracic cavity from the abdominopelvic cavity.

**Diaphysis** *dī-af'ī-sis* elongated shaft of a long bone.

**Diarthrosis** *dī'ar-thro'sis* a freely movable joint.

**Diastole** *dī-as'to-le* a period (between contractions) of relaxation of the heart during which it fills with blood.

**Diastolic pressure** *dī'as-tō'lik* the arterial blood pressure during ventricular relaxation (diastole).

**Diencephalon** *dī'en-sef'ab-lon* that part of the forebrain between the cerebral hemispheres and the midbrain including the thalamus, the third ventricle, and the hypothalamus; also called *interbrain*.

**Diffusion** *dī-fu'zhun* the spreading of particles in a gas or solution with a movement toward uniform distribution of particles; also called simple diffusion.

**Digestive system** system that processes food into absorbable units and eliminates indigestible wastes.

**Digital** pertaining to the digits; fingers, toes.

**Distal convoluted tubule (DCT)** segment of kidney tubule between the ascending nephron loop and the collecting duct; site of some reabsorption and some secretion.

**Diverticulum** *dī'ver-tik'u-lum* a pouch or sac in the walls of a hollow organ or structure.

**Dorsal ramus** branch of a spinal nerve that serves the skin and muscles of the posterior trunk.

**Dorsal root** the root at which sensory neurons enter the spinal cord.

**Dorsal root ganglion** the location of cell bodies of sensory neurons which enter the spinal cord via the dorsal root.

**Ductus arteriosus** a shunt in the fetal heart that connects the aorta and pulmonary trunk in order to bypass the immature lungs.

**Ductus deferens** *duk'tus def'er-enz* segment of the male duct system that links the epididymis to the ejaculatory duct.

**Ductus venosus** a shunt in the fetal heart that bypasses the immature liver.

**Duodenum** *doo'ub-de'num* the first part of the small intestine.

**Dura mater** *du'rab ma'ter* the outermost and toughest of the three membranes (meninges) covering the brain and spinal cord.

**Dynamic equilibrium** sense that reports on angular or rotatory movements of the head in space.

**Dyspnea** *disp'ne-ab* labored, difficult breathing.

**Eccrine gland** *ek'rin* the more numerous type of sweat gland found all over the body, but particularly abundant on the palms, soles of feet, and the forehead. Its secretions contain water, salts and metabolic wastes such as urea and uric acid.

**Edema** *ē-de'mab* an abnormal accumulation of fluid in body parts or tissues; causes swelling.

**Effector** *ef-fek'tor* an organ, gland, or muscle capable of being activated by nerve endings.

**Efferent** *ef'er-ent* carrying away or away from.

**Efferent arteriole** arteriole leaving the glomerulus and connecting it to the peritubular capillaries.

**Ejaculation** *e-jak'u-la'shun* the sudden ejection of semen from the penis.

**Electrical energy** energy form resulting from the movement of charged particles.

**Electrocardiogram (ECG)** *e-lek'tro-kar' de-o-gram* a graphic record of the electrical activity of the heart.

**Electroencephalogram (EEG)** *(e-lek'tro-en-sef' ab-lo-gram* graphic record of the electrical activity of the brain.

**Electrolyte** *e-lek'tro-līt* a substance that breaks down into ions when in solution and is capable of conducting an electric current.

**Electron (e<sup>-</sup>)** negatively charged subatomic particle; orbits the atomic nucleus.

**Electron transport chain** metabolic pathway within the mitochondria in which energy harvested from high-energy hydrogen atoms is used to make ATP. Final delivery of H to molecular oxygen produces water.

**Element** *el'ē-ment* any of the building blocks of matter; oxygen, hydrogen, carbon, for example.

**Embolus** a free-floating clot in an unbroken vessel.

**Embryo** *em'bre-o* an organism in its early stages of development; in humans, the first 2 months after conception.

**Emmetropia** the eye that focuses images correctly on the retina is said to have this "harmonious vision."

**Endocardium** *en'do-kar'de-um* the endothelial membrane lining the interior of the heart.

**Endocrine glands** *en'do-krin* ductless glands that empty their hormonal products directly into the blood.

**Endocytosis** *en'do-si-to'sis* means by which fairly large extracellular molecules or particle enter cells. See *phagocytosis*, *pinocytosis*, *receptor-mediated endocytosis*.

**Endolymph** *en'do-limf* thick fluid inside the membranous labyrinth similar to perilymph.

**Endometrium** *en-do-me'tre-um* the mucous membrane lining of the uterus.

**Endomysium** *en'do-mis'e-um* the thin connective tissue surrounding each muscle cell.

**Endoneurium** a delicate connective tissue sheath surrounding each fiber in a nerve.

**Endoplasmic reticulum (ER)** *en'do-plas'mik rē-tik'u-lum* a membranous network of tubular or saclike channels in the cytoplasm of a cell.

**Energy** the ability to do work.

**Enteroendocrine cells** cells of the gastric glands that secrete locally acting hormones, such as gastrin.

**Enzyme** *en'zīm* a substance formed by living cells that acts as a catalyst in chemical reactions in the body; see *catalyst*.

**Eosinophils** *e'o-sin'o-filz* granular white blood cells whose granules readily take up a stain called eosin.

**Ependymal cell** *ē-pen'dī-mal* type of CNS supporting cell; lines the central cavities of the brain and spinal cord and circulates cerebrospinal fluid with their beating cilia.

**Epocardium** visceral layer of a serous membrane that tightly hugs the external surface of the heart and is actually part of the heart wall; also called *visceral pericardium*.

**Epidermis** *ep'ī-der'mis* the outer layers of the skin; an epithelium.

**Epididymis** *ep'ī-did'ī-mis* that portion of the male duct system in which sperm mature. Empties into the ductus deferens (vas deferens).

**Epiglottis** *ep'ī-glot'is* the elastic cartilage at the back of the throat; covers the glottis during swallowing.

**Epimysium** *ep'ī-mis'e-um* the sheath of fibrous connective tissue surrounding a muscle.

**Epineurium** a tough, fibrous sheath that binds together the fascicles in a nerve.

**Epiphyseal line** calcified line in the epiphysis of a long bone that contained hyaline cartilage during the period of long bone growth, which ends when calcification is complete.

**Epiphyseal plate** plate of hyaline cartilage in the epiphysis of a long bone that allows for growth in length.

**Epiphysis** *ē-pif'ī-sis* the end of a long bone.

**Epithalamus** roof of the third ventricle; composed of the pineal gland and the choroid plexus of the third ventricle.

**Epithelial membranes** membranes composed of epithelial tissue with an underlying layer of connective tissue; covering and lining membranes. See *mucous membrane* and *serous membrane*.

**Epithelium** *ep'ī-the'le-um* one of the primary tissues; covers the surface of the body and lines the body cavities, ducts, and vessels.

**Erection** enlargement and increased rigidity of the penis resulting when erectile tissue fills with blood.

**Erythrocytes** *ē-rit'h'ro-sīts* red blood cells.

**Erythropoietin** hormone that stimulates erythrocyte production; secreted by kidneys.

**Esophagus** muscular tube that carries food from the pharynx to the stomach.

**Estrogens** *es'tro-jenz* hormones that stimulate female secondary sex characteristics; female sex hormones.

**Eupnea** *ūp-ne'ab* easy, normal breathing.

**Exchange reaction** a chemical reaction in which bonds are both made and broken; atoms become combined with different atoms.

**Excretion** *ek-skere'shun* the elimination of waste products from the body.

**Exocrine glands** *ek'so-krin* glands that have ducts through which their secretions are carried to a body surface (skin or mucosa).

**Exocytosis** *ek'so-si-to'sis* method for the movement of substances from the cell interior to the extracellular space as a secretory vesicle fuses with the plasma membrane.

**Expiration** *eks'pī-ra'shun* the act of expelling air from the lungs; exhalation.

**Extracellular fluid (ECF)** fluid within the body but outside the cells; see *interstitial fluid*.

**Extracellular matrix** nonliving material in connective tissue consisting of ground substance and fibers that separate the living cells.

**Facilitated diffusion** passive transport process driven by a concentration gradient and requiring a membrane protein to act as a carrier or channel.

**Fallopian tube** *fal-lo'pe-an* see *uterine tube*.

**Fascicle** *fas'ī-kul* a bundle of nerve or muscle fibers bound together by connective tissue.

**Feces** *fe'sēz* material discharged from the bowel composed of food residue, secretions, and bacteria.

**Femoral** pertaining to the thigh.

**Fenestrated capillaries** unique capillaries with large pores that allow extensive exchange.

**Fertilization** *fer'ī-lī-za'shun* fusion of the nuclear material of an egg and a sperm.

**Fetus** *fe'tus* the unborn young; in humans, the period from the third month of development until birth.

**Fibrillation** *fī-brī-la'shun* irregular, uncoordinated contraction of muscle cells, particularly of the heart musculature.

**Fibrin** *fī'brin* the fibrous insoluble protein formed during the clotting of blood.

**Fibrocartilage callus** repair tissue formed during bone remodeling; "splint" composed of cartilage matrix, bony matrix, and collagen fibers.

**Fibrous joint** bones joined by fibrous tissue; no joint cavity is present.

**Fibrous pericardium** loose-fitting sac surrounding the heart that anchors the heart to surrounding structures.

**Fibrous protein** a strandlike protein that appears most often in body structures; very important in binding structures together and for providing strength in certain body tissues; also called *structural protein*.

**Fibular** pertaining to the area of the fibula, the lateral bone of the leg.

**Filtration** *fil-tra'shun* the passive process of forcing water and solutes through a membrane using a fluid pressure gradient.

**Fimbriae** *fim'bre-e* fingerlike projections that line the distal end of each uterine tube that create fluid currents to wave the oocyte inside after ovulation.

**Fissure** *fis'zher* (1) a groove or cleft; (2) the deepest depressions or inward folds on the brain.

**Flaccid** *flā'sid* soft; flabby; relaxed.

**Flagella** *flab-jel'ab* long, whiplike extensions of the cell membrane of some bacteria and sperm; serve to propel the cell.

**Follicle** *fol'ī-kul* (1) structure in an ovary consisting of a developing egg surrounded by follicle cells; (2) colloid-containing structure in the thyroid gland; (3) collection of lymphocytes in a lymph node.

**Follicle cells** cells that surround and help nourish a developing oocyte.

**Fontanels** *fon'tab-nelz'* the fibrous membranes in the skull where bone has not yet formed; babies' "soft spots."

**Foramen** *fo-ra'men* a hole or opening in a bone or between body cavities.

**Formed elements** cellular portion of blood.

**Fovea centralis** *fo've-ab sen-trā'lis* pit containing only cones lateral to the blind spot of the eye.

**Frequency** (1) the number of sound waves per unit time, measured in Hertz; (2) the need to urinate often.

**Frontal (coronal) section (plane)** a longitudinal plane that divides the body or an organ into anterior and posterior portions.

**Fused tetanus** *tel'ab-nus* a completely smooth, sustained muscle contraction resulting from rapid stimulation with no time for relaxation between stimulation events; also called *complete tetanus*.

**Gallstones** particles of hardened cholesterol or calcium salts that are occasionally formed in the gallbladder and bile ducts.

**Gamete** *gam'ēt* male or female sex cell (sperm/egg).

**Ganglion** *gang'le-on* a group of nerve cell bodies located in the peripheral nervous system.

**Gap junction** a passageway between two neighboring cells; formed by transmembrane proteins called connexons.

**Gastric glands** glands within the gastric pits of the stomach that secrete the components of gastric juice and include chief, parietal, mucous neck, and enteroendocrine cells.

**Gastric juice** fluid formed by secretions of the gastric glands, characterized by extreme acidity and pepsin, a protein-digesting enzyme.

**Gastrin** *gas'trin* a hormone that stimulates gastric secretion, especially release of hydrochloric acid.

**Gastrointestinal (GI) tract** continuous hollow muscular tube including all structures from mouth to anus.

**Gene** *jēn* biological units of heredity located in chromatin; transmits hereditary information.

**Gland** an organ specialized to secrete or excrete substances for further use in the body or for elimination.

**Glaucoma** *glaw-ko'mab* an abnormal increase of the pressure within the eye.

**Globular protein** a protein whose functional structure is basically spherical. Also referred to as *functional protein*; includes hemoglobin, enzymes, and some hormones.

**Glomerular capsule** *glo-mer'u-ler* double-walled cuplike end of a renal tubule; encloses a glomerulus; also called *Bowman's capsule*.

**Glomerular filtration** the process of forcing fluids and small particles out of the blood and into the glomerular capsule and renal tubule.

**Glomerulus** *glo-mer'u-lus* a knot of coiled capillaries in the kidney; forms filtrate.

**Glottis** *glot'is* the opening between the vocal cords in the larynx.

**Gluconeogenesis** *glu'ko-ne'o-jen'ē-sis* the formation of new glucose molecules from noncarbohydrate substances, such as fats and proteins.

**Glucose** *gloo'kōs* the principal sugar in the blood; a monosaccharide.

**Gluteal** *gloo'te-al* pertaining to the buttock.

**Glycerol** *glis'er-ol* a sugar alcohol; one of the building blocks of fats.

**Glycogen** *gli'ko-jen* the main carbohydrate stored in animal cells; a polysaccharide.

**Glycogenesis** *gli'ko-jen'ē-sis* formation of glycogen from glucose.

**Glycogenolysis** *gli'ko-jen-ol'ī-sis* breakdown of glycogen to glucose.

**Glycolysis** *gli-kol'ī-sis* breakdown of glucose to pyruvic acid; an anaerobic process.

**Goblet cells** individual cells (simple glands) that produce mucus.

**Goiter** *goy'ter* a benign enlargement of the thyroid gland.

**Golgi apparatus** *gol'je ap'ub-rat'is* membrane-bound organelle responsible for modifying, packaging, and shipping proteins produced by rough ER to the appropriate destination.

**Gonads** *go'nadz* organs producing gametes; ovaries or testes.

**Gout** *gouty* arthritis; caused by uric acid buildup in joints. See *arthritis*.

**Graafian follicle** *graf'e-an fol'li-kul* see *vesicular follicle*.

**Graded potential** a local change in membrane potential that varies directly with the strength of the stimulus; declines with distance.

**Graded response** a response that varies directly with the strength of the stimulus.

**Gray matter** the gray area of the central nervous system; contains unmyelinated nerve fibers and nerve cell bodies.

**Gum** the tissue that surrounds the teeth like a tight collar; also called *gingiva* (*jin'jī-vab*).

**Gyrus** *ji'rus* an outward fold of the surface of the cerebral cortex.

**Hair** flexible epithelial structure composed of keratinized cells; produced by hair follicle.

**Hair follicle** Structure with inner root sheath of epithelial tissue that produces the hair; the outer root sheath is dermal connective tissue that provides the blood supply to epithelial cells.

**Hard palate** roof of mouth formed by the fusion of the two maxillae bones.

**Haustra** pocketlike sacs caused by tone of the teniae coli (longitudinal muscle bands) of the colon.

**Haversian system** *bā-ver'zhen* see *osteon*.

**Heartburn** pain in the esophagus due to reflux of gastric juice.

**Helper T cell** the type of T lymphocyte that orchestrates cellular immunity by direct contact with other immune cells and by releasing chemicals called cytokines; also helps to mediate the humoral response by interacting with B cells.

**Hematocrit** *he-mat'o-krit* the percentage of erythrocytes to total blood volume.

**Hematoma** blood-filled swelling; bruise.

**Hematopoiesis** *hem'ab-to-po-e'sis* formation of blood cells.

**Hemocytoblasts** *he'mo-si'to-blastz* stem cells that give rise to all the formed elements of the blood.

**Hemoglobin (Hb)** *he'mo-glo-bin* the oxygen-transporting pigment of erythrocytes.

**Hemolysis** *he-mol'ī-sis* the rupture of erythrocytes.

**Hemostasis** the stoppage of bleeding.

**Hepatic portal vein** single vein that drains the digestive tract organs and carries nutrient-rich blood to the liver before it enters general circulation.

**Hiatal hernia** protrusion of the superior part of the stomach above the diaphragm, resulting in entry of gastric juice into the esophagus.

**High-density lipoproteins** proteins that carry cholesterol from the tissues to the liver for destruction.

**Hilum** *hi'lum* a depressed area where vessels enter and leave an organ.

**Histamine** *bis'tab-mēn* a substance that causes vasodilation and increased vascular permeability.

**Homeostasis** *ho'me-o-sta'sis* a state of dynamic body equilibrium or stable internal environment of the body.

**Homeostatic imbalance** a disturbance or change in homeostasis that affects function.

**Hormones** *hor'mōnz* chemical messengers secreted by endocrine glands; responsible for specific regulatory effects on certain cells, tissues, or organs.

**Human chorionic gonadotropin (hCG)** an LH-like hormone produced by the developing embryo that tells the corpus luteum to continue producing hormones to prevent menses.

**Humerus** long bone of the upper arm; articulates with the scapula to form the shoulder joint and the radius and ulna to form the elbow joint.

**Humoral immunity** *hu'mor-al* immunity provided by antibodies released by sensitized B cells and their plasma cell progeny. Also called *antibody-mediated immunity*.

**Hyaline cartilage** cartilage connective tissue containing collagen fibers; has glassy appearance; found on ends of long bones and forms C-shaped rings in trachea.

**Hydrocephalus** a condition in which cerebrospinal fluid accumulates and puts pressure on the brain of an adult; in an infant, the skull may expand because the skull bones are not yet fused.

**Hydrogen bond** weak bond in which a hydrogen atom forms a bridge between two electron-hungry atoms. An important intramolecular bond.

**Hydrolysis** *hi-drol'ī-sis* the process in which water is used to split a substance into smaller particles.

**Hydrophilic** *hi'dro-fil'ik* refers to molecules, or portions of molecules, that interact with water and charged particles.

**Hydrophobic** *hi'dro-fo'bik* refers to molecules, or portions of molecules, that interact only with nonpolar molecules.

**Hyoid bone** *hi'oid* neck bone suspended by ligaments; does not articulate with any other bone.

**Hyperglycemia** *hi'per-gli-se'me-ab* high blood sugar.

**Hyperopia** *hi'per-o'pe-ab* farsightedness; distant objects are focused.

**Hyperpnea** *hy-perp'ne-ab* pattern of breathing faster and deeper during exercise.

**Hypersensitivities** allergies; overreaction of the immune system to a perceived threat, resulting in tissue damage.

**Hypertthyroidism** overactivity of the thyroid, resulting in higher-than-normal levels of thyroid hormone, causing an increased metabolic rate.

**Hypertonic** *hi'per-ton'ik* excessive, above normal, tone or tension.

**Hypertrophy** *hi-per'tro-fe* an increase in the size of a tissue or organ independent of the body's general growth.

**Hyperventilation** pattern of breathing in which excess carbon dioxide is exhaled in an effort to raise blood pH to its normal range.

**Hypodermis** adipose tissue beneath the skin. See *subcutaneous*.

**Hypoglycemia** low blood sugar.

**Hypospadias** *hi'pō-spa'de-as* condition occurring in male babies only where the urethral opening is located on the ventral surface of the penis.

**Hypothalamus** *hi'pō-thal'ab-mus* the region of the diencephalon forming the floor of the third ventricle of the brain.

**Hypothyroidism** decreased thyroid activity, resulting in a slow metabolic rate.

**Hypotonic** *hi'pō-ton'ik* below normal tone or tension.

**Hypoxia** *hi-pok'se-ab* a condition in which inadequate oxygen is available to tissues.

**Ileum** *il'e-um* the terminal part of the small intestine; between the jejunum and the cecum of the large intestine.

**Ilium** *il'e-um* large flaring bone of the hip; the most superior bone of the pelvis.

**Immune response** antigen-specific defenses mounted by activated lymphocytes (T cells and B cells).

**Immune system** the body system responsible for protecting the body from pathogens and foreign cells; involves both humoral and cell-mediated defenses.

**Immunodeficiency** *im'mu-no-de-fish'en-se* disease resulting from the deficient production or function of immune cells or certain molecules (complement, antibodies, and so on) required for normal immunity.

**Immunoglobulin (Ig)** *im'mu-no-glob'u-lin* a protein molecule, released by plasma cells, that mediates humoral immunity; an antibody.

**Inclusions** *in-klu'zhun* chemical substances stored in the cytoplasm of a cell.

**Incontinence** *in-kon'ti-nens* the inability to control the external urethral sphincter.

**Infarct** *in'farkt* a region of dead, deteriorating tissue resulting from a lack of blood supply.

**Inferior vena cava** large vein that carries blood from veins inferior to the diaphragm back to the right atrium.

**Inflammatory response** *in-flam'ab-tor'e* a physiological response of the body to tissue injury; includes dilation of blood vessels and increased blood vessel permeability.

**Inguinal** *in'gwī-nal* pertaining to the groin region.

**Innate defense system** natural defenses that protect against all foreign material, not specifically for any one antigen; also called *nonspecific defense system*.

**Inorganic compound** a compound that lacks carbon; for example, water.

**Insertion** *in-ser'shun* the movable attachment of a muscle as opposed to its origin.

**Inspiration** *in'spī-ra'shun* the drawing of air into the lungs; inhalation.

**Inspiratory reserve volume (IRV)** amount of air that can be forcibly inhaled in addition to tidal volume.

**Insulin** pancreatic hormone that decreases blood glucose.

**Integration** the process in which the nervous system processes and interprets sensory input and makes decisions about what should be done.

**Integumentary system** *in-teg'u-men'tub-re* the skin and its accessory organs (*jin'jī-vab*).

**Intercalated discs** *in-ter'kab-la'ted* specialized connections for communication between cardiac muscle cells containing gap junctions and desmosomes.

**Intermediate filaments** one of three types of rods in the cytoskeleton of a cell; resists pulling forces on the cell.

**Interneuron** completes the pathway between afferent and efferent neurons; also called an *association neuron*.

**Interosseous membrane** flexible fibrous connective tissue attachment connects the radius and ulna, and the tibia and fibula along their lengths.

**Interphase** the period in a cell's life cycle when it performs its usual metabolic activities and prepares for cell division by copying the DNA (genes).

**Interstitial cells** *in'ter-stish'al* cells in the testes between the seminiferous tubules that produce testosterone.

**Interstitial fluid (tissue fluid)** *in'ter-stish'al* the fluid between the cells; also called *extracellular fluid*.

**Intervertebral discs** *in'ter-ver'tē-bral* the discs of fibrocartilage between the vertebrae.

**Intrapleural pressure** pressure in the space between the pleurae; always negative compared to intrapulmonary pressure.

**Intrinsic conduction system** control system built into the heart that sets the rate of contraction by stimulating the myocardium in an atrial to ventricular direction; also called *nodal system*.

**Intrinsic factor** *in-trin'sik* a substance produced by the stomach that is required for vitamin B<sub>12</sub> absorption.

**Ion** *i'on* an atom with a positive or negative electric charge.

**Ionic bond** bond formed by the complete transfer of electron(s) from one atom to another (or others). The resulting charged atoms, or ions, are oppositely charged and attract each other.

**Iris** *i'ris* the pigmented, involuntary muscle that acts as the diaphragm of the eye; part of the vascular tunic of the eye.

**Irritability** *ir'ī-tab-bil'ī-te* ability to respond to a stimulus.

**Ischemia** *is-ke'me-ab* a local decrease in blood supply.

**Ischium** *is'ke-um* inferior bone of the hip; "sit bone."

**Isometric contraction** *i'so-met'rik* refers to "same length"; the muscle generates tension but does not shorten, and no movement occurs.

**Isotonic contraction** *i'so-ton'ik* refers to "same tone"; the muscle shortens as it contracts, and movement occurs.

**Isotope** *i'sī-tōp* different atomic form of the same element. Isotopes vary only in the number of neutrons they contain.

**Jaundice** *jawn'dis* an accumulation of bile pigments in the blood producing a yellow color of the skin.

**Jejunum** *jē-joo'num* the part of the small intestine between the duodenum and the ileum.

**Joint** the junction of two or more bones; an articulation.

**Juxtamedullary nephrons** nephrons that sit close to the cortex-medulla junction, with nephron loops that dip deep into the renal medulla.

**Keratin** *ker'ab-tin* a tough, insoluble protein found in tissues such as hair, nails, and epidermis of the skin.

**Ketoacidosis** low blood pH due to the metabolism of fats to produce ATP in the absence of sufficient glucose.

**Kilocalories (kcal)** unit used to measure the energy value of food.

**Kinetic energy** energy of motion.

**Kinins** *ki'ninz* group of polypeptides that dilate arterioles, increase vascular permeability, and induce pain.

**Kyphosis** *ki-fo'sis* hump formed by the abnormal curvature of the thoracic spine in a posterior direction.

**Labia** *la'be-ab* lips.

**Lacrimal** *lak'rī-mal* pertaining to tears.

**Lactation** *lak-ta'shun* the production and secretion of milk.

**Lacteal** *lak'te-al* special lymphatic capillaries of the small intestine that take up lipids.

**Lactic acid** *lak'tik* the product of anaerobic metabolism, especially in muscle.

**Lacuna** *lab-ku'nab* a little depression or space; in bone or cartilage, lacunae are occupied by cells.

**Lambdoid suture** interlocking joint between the occipital bone and the parietal bones.

**Lamella** concentric rings of bone matrix with lacuna between them.

**Lamina** *lam'ī-nab* (1) a thin layer or flat plate; (2) the portion of a vertebra between the transverse process and the spinous process.

**Larynx** *lar'inks* the cartilaginous organ located between the trachea and the pharynx; voice box.

**Leukemia** *lu-ke'me-ab* a cancerous condition in which there is an excessive production of immature leukocytes.

**Leukocyte** *lu'ko-sīt* white blood cell.

**Ligament** *lig'ab-ment* a cord of fibrous tissue that connects bones.

**Lingual tonsils** pair of tonsils at the base of the tongue.

**Lipid** *lip'id* organic compound formed of carbon, hydrogen, and oxygen; examples are neutral fats and cholesterol.

**Liver** gland of the digestive tract that produces bile and is the major metabolic gland of the body.

**Long bone** a bone that is longer than it is wide. See *humerus* and *femur*.

**Lordosis** *lor-do'sis* the abnormal curvature of the lumbar spine in an anterior direction.

**Low-density lipoproteins** proteins that carry cholesterol to the tissues.

**Lumbar** *lum'bar* the portion of the back between the thorax and the pelvis; the loin.

**Lumen** *lu'men* the space inside a tube, blood vessel, or hollow organ.

**Lungs** organs of the respiratory system responsible for air exchange with the outside and gas exchange with the blood.

**Luteinizing hormone (LH)** gonadotropic hormone released by the anterior pituitary gland.

**Lymph** *limf* the watery fluid in the lymph vessels collected from the tissue spaces.

**Lymphatic system** *lim-fat'ik* the lymphatic vessels and the lymphoid tissues and organs, including lymph nodes.

**Lymphocytes** *lim'fo-sūtz* agranular white blood cells formed in the bone marrow that mature in the lymphoid tissue.

**Lymphoid organs** organs in the lymphatic system, including lymph nodes, spleen, and tonsils; see *lymphatic system*.

**Lysosomes** *li'so-sōmz* organelles that originate from the Golgi apparatus and contain strong digestive enzymes.

**Lysozyme** *li'so-zīm* an enzyme found in sweat, saliva, and tears that is capable of destroying certain kinds of bacteria.

**Macrophage** *mak'ro-fā'* cell particularly abundant in lymphatic and connective tissues; important in the immune response as an antigen presenter to T cells and B cells.

**Maculae** *mak'u-le* static equilibrium receptors found in the vestibule.

**Main (primary) bronchi** divisions of the trachea that lead into the right and left lungs.

**Major nutrients** nutrients the body requires in significant amounts; include carbohydrates, proteins, and fats.

**Malignant** *mab-lig'nant* life-threatening; pertains to neoplasms that spread and lead to death, such as cancer.

**Malleus** *mā'le-us* lateral bone of the middle ear; also called the *hammer*.

**Mammary glands** *mam'mer-e* milk-producing glands of the breasts.

**Manubrium** *mab-nu'bre-um* the most superior of the three bones of the sternum.

**Mass movements** long, powerful, slow-moving contractions of the large intestine that move materials toward the rectum.

**Mastication** *mas'ti-ka'shun* the act of chewing.

**Matter** anything that occupies space and has mass.

**Maxillary bones** *mak-sil'ub-re* paired facial bones that fuse to form the upper jaw and articulate with all other facial bones except the mandible; also called *maxillae*.

**Mechanical energy** energy form directly involved in putting matter into motion.

**Mechanoreceptors** *mek'ab-no-re-sep'terz* receptors sensitive to mechanical pressures such as touch, sound, or contractions.

**Median (midsagittal) section** specific sagittal plane that lies exactly in the midline.

**Mediastinum** *me'de-as-ti'num* the region of the thoracic cavity between the lungs that houses the heart.

**Medulla** *mē-dul'ab* the central portion of certain organs.

**Medulla oblongata** most inferior part of brainstem involved in visceral control.

**Medullary cavity** central cavity in the diaphysis of a long bone containing marrow.

**Megakaryocytes** large, multinucleate cells that fragment to produce platelets.

**Meiosis** *mi-o'sis* the two successive cell divisions in gamete formation producing nuclei with half the full number of chromosomes (haploid).

**Melanin** *mel'ab-nin* the dark pigment synthesized by melanocytes; responsible for skin color.

**Membranous urethra** the part of the male urethra that connects the prostatic urethra to the penis.

**Memory cell** member of T cell and B cell clones that provides for immunological memory.

**Menarche** *mē-nar'ke* establishment of menstrual function; the first menstrual period.

**Meninges** *mē-nin'jēz* the membranes that cover the brain and spinal cord.

**Menopause** *men'o-pawz* the physiological end of menstrual cycles.

**Menstrual cycle** the periodic, cyclic discharge of blood, secretions, tissue, and mucus from the mature female uterus in the absence of pregnancy; a series of cyclic changes of the endometrium in response to changing ovarian hormone levels; also called *menstruation*, *uterine cycle*.

**Mental** pertaining to the chin.

**Merkel cell** cells associated with nerve endings that serve as touch receptors.

**Mesentery** *mes'en-ter'e* the double-layered membrane of the peritoneum that supports most organs in the abdominal cavity.

**Messenger RNA (mRNA)** long nucleotide strands that reflect the exact nucleotide sequence of the DNA gene; carry this information to the ribosome for protein synthesis.

**Metabolism** *mē-tab'o-lizm* the sum total of the chemical reactions that occur in the body.

**Metacarpal** *mel'ab-kar'pal* one of the five bones of the palm of the hand.

**Metastasis** *mē-tas'tab-sis* the spread of cancer from one body part or organ into another not directly connected to it.

**Metatarsal** *mel'ab-tar'sal* one of the five bones between the tarsus and the phalanges of the foot.

**Microfilaments** *mi'kro-fil'ab-ments* thin strands of the contractile protein actin; one of three types of rods in the cytoskeleton of a cell.

**Microglia** *mi-krog'le-ab* type of CNS supporting cell; phagocytes that ingest debris such as bacteria or dead cells.

**Microtubules** *mi'kro-too'bulz* one of three types of rods in the cytoskeleton of a cell; hollow tubes made of spherical protein that determine the cell shape and the distribution of cellular organelles.

**Microvilli** *mi'kro-vil'i* the tiny projections on the free surfaces of some epithelial cells; increase surface area for absorption.

**Micturition** *mik'tu-rish'un* urination, or voiding; emptying the bladder.

**Midbrain** part of the brain stem containing reflex centers for vision and hearing, and fiber tracts (cerebral peduncles) that convey both ascending and descending impulses.

**Minor nutrients** vitamins and minerals; nutrients the body needs in small amounts.

**Miscarriage** termination of a pregnancy before the embryo or fetus is viable outside the uterus.

**Mitochondria** *mi'to-kon'dre-ab* the rod-like cytoplasmic organelles responsible for ATP generation.

**Mitosis** *mi-to'sis* the division of the cell nucleus; often followed by division of the cytoplasm of a cell.

**Mixed nerves** nerves containing the processes of motor and sensory neurons; their impulses travel to and from the central nervous system.

**Molecule** *mol'ē-kyool* particle consisting of two or more atoms held together by chemical bonds.

**Monoclonal antibodies** *mon'o-klōn'ul* pure preparations of identical antibodies that exhibit specificity for a single antigen.

**Monocyte** *mon'o-sī* large single-nucleus white blood cell; agranular leukocyte.

**Monosaccharide** *mon'o-sak'ī-rīd* literally, one sugar; the building block of carbohydrates; examples include glucose and fructose.

**Motor division** the part of the PNS that sends motor signals from the CNS to muscles or glands; also called *efferent division*.

**Motor unit** a motor neuron and all the muscle cells it supplies.

**Mucosa** innermost layer of the gastrointestinal tract; see *mucous membrane*.

**Mucous membrane (mucosa)** membrane that forms the linings of body cavities open to the exterior (digestive, respiratory, urinary, and reproductive tracts).

**Multiple sclerosis (MS)** autoimmune disorder of the CNS where the myelin sheaths are converted into hardened scleroses in the brain and spinal cord; results in loss of control.

**Multipolar neuron** structural class of neuron with more than two processes extending from the cell body.

**Muscle fatigue** inability of a muscle to contract even while being stimulated.

**Muscle tissue** one of four main tissue types; specialized to contract (shorten) in order to produce a force that will cause movement.

**Muscle tone** sustained partial contraction of a muscle in response to stretch receptor inputs; keeps the muscle healthy and ready to react.

**Muscle twitch** a single rapid contraction of a muscle followed by relaxation.

**Muscular system** organ system consisting of skeletal muscles and their connective tissue attachments.

**Muscularis externa** smooth muscle layer of the gastrointestinal tract composed of an inner circular layer and an outer longitudinal layer.

**Myasthenia gravis** *mi'as-the'ne-ab grā'vis* an autoimmune disease affecting muscles; characterized by weakness and fatigue due to a shortage of acetylcholine receptors.

**Myelin** *mi'ē-lin* a white, fatty lipid substance.

**Myocardial infarction** *mi'o-kar'de-al in-fark'shun* a condition characterized by dead tissue areas in the myocardium caused by interruption of blood supply to the area.

**Myocardium** *mi'o-kar'de-um* the cardiac muscle layer of the heart wall.

**Myofibrils** *mi'o-fi'brilz* contractile organelles found in the cytoplasm of muscle cells.

**Myofilament** *mi'o-fil'ab-ment* filaments composing the myofibrils. Of two types: actin and myosin.

**Myometrium** *mi'o-me'tre-um* the thick uterine musculature.

**Myopia** *mi-o'pe-ab* nearsightedness; near objects are in focus.

**Myosin** *mi'o-sin* one of the principal contractile proteins found in muscle; makes up the thick filaments.

**Nasal** pertaining to the nose.

**Nasal septum** tissue at midline that separates the nasal cavity into right and left sides.

**Natural killer (NK) cells** unique lymphocytes that are part of the nonspecific defenses; kill cells that do not exhibit self markers.

**Neck** (1) portion of the body connecting the head to the thorax that contains the trachea and esophagus; (2) portion of a tooth connecting the crown and root.

**Negative feedback** feedback that causes the stimulus to decline or end.

**Nephron** *nef'ron* structural and functional unit of the kidney.

**Nephron loop** portion of the renal tubule between the proximal and distal convoluted tubules; also called *loop of Henle*.

**Nerve** bundle of neuronal processes (axons) outside the central nervous system.



**Nerve impulse** a self-propagating wave of depolarization; also called an *action potential*.

**Nervous system** fast-acting control system that employs nerve impulses to trigger muscle contraction or gland secretion.

**Nervous tissue** one of four main tissue types; specialized for irritability (respond to stimuli) and conductivity.

**Neuroglia** *nu-rōg'le-ab* the nonneuronal tissue of the central nervous system that performs supportive and other functions; also called *glial cells* or *glia*.

**Neuromuscular junction** *nu'ro-mus'ku-lar* the region where a motor neuron comes into close contact with a skeletal muscle cell.

**Neurons** *nu'ronz* cells of the nervous system specialized to transmit messages throughout the body.

**Neurotransmitter** chemical released by neurons that may, upon binding to receptors of neurons or effector cells, stimulate or inhibit them.

**Neutral fats** dietary fats; also called *triglycerides*.

**Neutralization** *nu'tral-i-za'shun* (1) a chemical reaction that occurs between an acid and a base; (2) blockage of the harmful effects of bacterial exotoxins or viruses by the binding of antibodies to their functional sites.

**Neutron (n<sup>0</sup>)** *nu'tron* uncharged subatomic particle; found in the atomic nucleus.

**Neutrophils** *nu'tro-filz* the most abundant of the white blood cells.

**Nose** the only external organ of the respiratory system.

**Nuclear envelope** the double membrane barrier of the nucleus; separates the nucleoplasm from the cytoplasm.

**Nucleic acid** *nu-kle'ik* class of organic molecules that includes DNA and RNA.

**Nucleoli** *nu-kle'o-li* small spherical bodies in the cell nucleus; function in ribosome synthesis.

**Nucleotide** *nu'kle-o-tid* building block of nucleic acids.

**Nucleus** *nu'kle-us* (1) a dense central body in most cells containing the genetic material of the cell; (2) cluster of neuronal cell bodies in the brain or spinal cord.

**Nutrient** chemical substance used by the body for normal growth, maintenance, and repair.

**Occipital** *ok-sip'i-tal* pertaining to area at the back of the head.

**Olecranal** *ol-eh-kra'nel* pertaining to the posterior surface of the elbow.

**Oligodendrocyte** *ol'ĩ-go-den'dro-sũ* type of CNS supporting cell that has many cellular processes, each of which makes up a myelin sheath.

**Oocyte** *o'o-sũ* an immature egg.

**Oogenesis** *o'o-jen'ẽ-sis* the process of formation of the ova.

**Optic chiasma** *op'tik ki-as'mab* the partial crossover of fibers of the optic nerves.

**Optic disc** site where the optic nerve meets the retina; causes the blind spot.

**Oral cavity** the mouth; contains teeth and the tongue.

**Orbital** eye area.

**Organ** a part of the body formed of two or more tissues that performs a specialized function.

**Organ system** a group of organs that work together to perform a vital body function; e.g., nervous system.

**Organelles** *or'gab-nelz'* specialized structures in a cell that perform specific metabolic functions.

**Organic compound** a compound containing carbon; examples include proteins, carbohydrates, and fats.

**Organism** an individual living thing.

**Origin** the muscle attachment that is not movable or is less movable than the insertion.

**Orthostatic hypotension** temporary hypotension due to abrupt movement from a sitting or reclining position to an upright position.

**Osmoreceptor** *oz'mo-re-sep'tor* a structure sensitive to osmotic pressure or concentration of a solution.

**Osmosis** *oz-mo'sis* the diffusion of water (a solvent) through a membrane from a dilute solution into a more concentrated one.

**Ossicles** *os'sĩ-kulz'* the three bones of the middle ear: hammer (malleus), anvil (incus), and stirrup (stapes); also called the *auditory ossicles*.

**Ossification** the process of bone formation.

**Osteoarthritis (OA)** most common form of arthritis; caused by wear and tear at joints that leads to articular cartilage breakdown. See *arthritis*.

**Osteoblasts** *os'te-o-blasts'* bone-forming cells.

**Osteoclasts** *os'te-o-klasts'* large cells that resorb or break down bone matrix.

**Osteocyte** *os'te-o-sĩt'* a mature bone cell.

**Osteon** *os'te-on* the structural and functional unit of compact bone; Haversian system.

**Osteoporosis** *os'te-o-po-ro'sis* an increased softening of the bone resulting from a gradual decrease in rate of bone formation; a common condition in older people.

**Otolith** *o'to-liĩb* one of the small calcified masses in the maculae of the vestibular apparatus in the inner ear.

**Otolithic membrane** gelatinous membrane in a macula with receptor "hairs" embedded in it and studded with otoliths.

**Otosclerosis** *o'to-skẽ-ro'sis* fusion of the ossicles (bones) in the middle ear; results in conduction deafness.

**Oval window** the superior, membrane-covered opening in the middle ear wall; sound is conveyed to the oval window by the stirrup (stapes).

**Ovarian cycle** *o-va're-an* the monthly cycle of follicle development, ovulation, and corpus luteum formation in an ovary.

**Ovarian follicles** saclike structures consisting of follicle cells and a developing oocyte.

**Ovarian ligaments** bilateral ligaments that anchor the ovaries to the uterus.

**Ovary** *o'var-e* the female sex organ in which ova (eggs) are produced.

**Ovulation** *ov'u-la'shun* the release of an ovum (or oocyte) from the ovary.

**Ovum** *o'vum* the female gamete (germ cell); an egg.

**Oxygen deficit** *ok'sĩ-jen* the volume of oxygen required after exercise to oxidize the lactic acid formed during exercise.

**Oxyhemoglobin** *ok'se-be'mo-glo'bin* hemoglobin combined with oxygen.

**P wave** wave on an ECG representing depolarization of the atria.

**Pacemaker** see *sinoatrial node*.

**Palate** *pal'et* roof of the mouth.

**Palatine tonsils** pair of tonsils flanking the oropharynx.

**Pancreas** *pan'kre-as* gland posterior to the stomach, between the spleen and the duodenum; produces both endocrine and exocrine secretions.

**Pancreatic juice** *pan'kre-at'ik* a secretion of the pancreas containing enzymes for digestion of all food categories.

**Papilla** *pab-pil'ab* small nipplelike projection.

**Papillary layer** superficial layer of dermis bordering epidermis; contains dermal papillae, the cause of fingerprints. See *dermal papillae*.

**Paranasal sinuses** air-filled spaces within the maxillae on either side of the nasal cavity that are lined with mucous membrane; help lighten the skull.

**Parasympathetic division** *par'ab-sim'pab-thet'ik* a division of the autonomic nervous system; also referred to as the *craniosacral division*.

**Parathyroid glands** *par'ab-thi'roid* small endocrine glands located on the posterior aspect of the thyroid gland.

**Parathyroid hormone (PTH)** hormone released by the parathyroid glands that regulates blood calcium level.

**Parietal cells** cells of the gastric glands that produce hydrochloric acid (HCl).

**Parietal pericardium** outermost layer of the serous pericardium that lines the interior surface of the fibrous pericardium.

**Parietal peritoneum** lining of the abdominopelvic cavity that is continuous with the serosa, or visceral peritoneum of the gastrointestinal tract.

**Parietal pleura** *ploor'ab* serous membrane layer covering the cavity in which the lung resides.

**Parotid glands** large salivary glands anterior to the ears.

**Passive immunity** short-lived immunity resulting from the introduction of "donated antibodies" obtained from an immune animal or human donor; immunological memory is not established.

**Pathogen** disease-causing microorganism (some bacteria, fungi, viruses, etc.).

**Pectoral** *pek'to-ral* pertaining to the chest.

**Pectoral girdle** composite of two bones, scapula and clavicle, that attach the upper limb to the axial skeleton; also called the *shoulder girdle*.

**Pedicle** bony extension connecting the centrum and transverse process of a vertebra.

**Pelvic** pertaining to the anterior area overlying the pelvis.

**Pelvic girdle** incomplete bony basin formed by the two coxal bones and the sacrum.

**Penis** *pe'nis* the male organ of copulation and urination.

**Pepsin** an enzyme capable of digesting proteins in an acid pH.

**Perforating canal** canal running at right angles to the central canal in an osteon. Also called *Volkmann's canal*.

**Perforating fibers** connective tissue fibers that secure the periosteum to the bone; also called *Sharpey's fibers*.

**Pericardium** *per"i-kar'de-um* the membranous sac enveloping the heart.

**Perilymph** *per' i-limf* plasmalike fluid filling the bony labyrinth.

**Perimysium** *per"i-mis'e-um* the connective tissue enveloping bundles of muscle fibers.

**Perineum** *per"i-ne'um* that region of the body extending from the anus to the scrotum in males and from the anus to the vulva in females.

**Perineurium** coarse connective tissue wrapping that binds groups of fibers in a nerve, forming fascicles, or fiber bundles.

**Periosteum** *per-e-os'te-um* double-layered connective tissue membrane that covers and nourishes the bone.

**Peripheral nervous system (PNS)** *pě-rij'er-al* a system of nerves that connects the outlying parts of the body with the central nervous system.

**Peripheral resistance** the resistance to blood flow offered by the systemic blood vessels; a measure of the amount of friction encountered by blood.

**Peristalsis** *per"i-stal'sis* the waves of contraction seen in tubelike organs; propels substances along the tract.

**Peritoneum** *per"i-to-ne'um* the serous membrane lining the interior of the abdominal cavity and covering the surfaces of the abdominal organs.

**Peritubular capillaries** low-pressure capillaries that arise from the efferent arteriole and surround the renal tubule of each nephron to aid in reabsorption.

**Peroxisomes** *per-ok'sib-sōmz* membranous sacs in the cytoplasm containing powerful oxidase enzymes that use molecular oxygen to detoxify harmful or toxic substances, such as free radicals.

**Petechiae** *pě-te'ke-e* rashlike spots on the skin that indicate widespread bleeding.

**pH** the symbol for hydrogen ion concentration; a measure of the relative acidity or alkalinity of a solution.

**Phagocyte** *fag'o-sīt* cell capable of engulfing and digesting particles or cells harmful to the body using the process of phagocytosis.

**Phagocytosis** *fag"o-si-to'sis* the ingestion of solid particles by cells.

**Phalanges** *fah-lan'jēz* the bones of the finger or toe.

**Pharyngeal-esophageal phase** the second, involuntary phase of swallowing.

**Pharyngeal tonsil** *far-rin'je-al* single tonsil, also called *adenoid*, located in the nasopharynx.

**Pharyngotympanic tube** tube that connects the middle ear and the pharynx; allows pressure to be equalized on both sides of the eardrum; also called the *auditory tube* and the *eustachian tube*.

**Pharynx** *far'inks* the muscular tube extending from the posterior of the nasal cavities to the esophagus.

**Phospholipid** *fos"fo-lip'id* a modified triglyceride containing phosphorus.

**Photoreceptors** *fō'to-re-sep'torz* specialized receptor cells that respond to light energy.

**Physiology** *fiz'e-ol'o-je* the science of the functioning of living organisms.

**Pia mater** innermost meningeal layer; clings to the surface of the brain and spinal cord.

**Pinocytosis** *pin"ub-si-to'sis* the engulfing of extracellular fluid by cells.

**Pivot joint** uniaxial synovial joint in which the rounded end of one bone fits into a sleeve or ring of bone or ligaments.

**Placenta** *plab-sen'tab* the temporary organ that provides nutrients and oxygen to the developing fetus, carries away wastes, and produces the hormones of pregnancy.

**Plane joint** nonaxial synovial joint in which the two bones have flat articular surfaces; a plane joint allows only short gliding movements.

**Plantar** *plan'tar* pertaining to the sole of the foot.

**Plasma** *plaz'mab* the fluid portion of the blood.

**Plasma cell** member of a B cell clone; specialized to produce and release antibodies.

**Plasma membrane** membrane that encloses cell contents; outer limiting membrane.

**Platelet** *plāt'let* one of the irregular cell fragments of blood; involved in clotting.

**Pleura** *ploo'rab* the serous membrane covering the lung and lining the thoracic cavity.

**Plexus** network of nerves formed by joining ventral rami of spinal nerves; contains both sensory and motor fibers.

**Plcae circulares** *pli'kub" ser ku-lar'ēz* cork-screw-like folds within the small intestine that increase the surface area and slow the progression of food through the small intestine; also called *circular folds*.

**Pneumothorax** *nu"mo-tho'raks* the presence of air or gas in a pleural cavity.

**Polar body** a minute cell produced during meiosis in the ovary.

**Polycythemia** *pol'e-si-tbe'me-ab* presence of an abnormally large number of erythrocytes in the blood.

**Polymer** *pol' i"mer* a long, chainlike molecule consisting of many similar or repeated units.

**Polysaccharide** *pol'e-sak' i-rīd* literally, many sugars; a polymer of linked monosaccharides; examples include starch and glycogen.

**Pons** (1) any bridgelike structure or part; (2) the brain area connecting the medulla with the midbrain, providing linkage between upper and lower levels of the central nervous system.

**Popliteal** related to the posterior knee.

**Positive feedback** feedback that tends to cause a variable to change in the same direction as the initial change; enhances the stimulus.

**Potential energy** stored energy; energy at rest; compare to *kinetic energy*.

**Precipitation** formation of insoluble complexes that settle out of solution.

**Pressure gradient** difference in hydrostatic (fluid) pressure that drives filtration.

**Primary curvatures** spinal curvatures in the thoracic and sacral areas that are present at birth.

**Primary (essential) hypertension** high blood pressure that cannot be directly linked to any specific cause.

**Primary humoral response** the initial response of the humoral arm of the immune system to an antigen; involves clonal selection and establishes immunological memory.

**Primary motor area** area of the cerebral cortex responsible for voluntary movement; located in the precentral gyrus.

**Primary somatic sensory area** area of the cerebral cortex responsible for interpreting impulses from cutaneous sense organs and proprioceptors; located in the postcentral gyrus.

**Progesterone** ovarian hormone produced by the corpus luteum and later the placenta; responsible for maintaining the uterine lining during pregnancy, inhibiting contraction of uterine muscle, and helping to prepare the breasts for lactation.

**Proprioceptor** *pro"pre-o-sep'tor* a receptor located in a muscle or tendon; concerned with locomotion, posture, and muscle tone.

**Prostate** accessory organ of the male reproductive tract that produces a milky fluid that contributes to semen by activating sperm.

**Prostatic urethra** the segment of the urethra that passes through the prostate.

**Protein** *pro'tēn* a complex nitrogenous substance; the main building material of cells.

**Proton (p<sup>+</sup>)** *pro'ton* subatomic particle that bears a positive charge; located in the atomic nucleus.

**Proximal convoluted tubule (PCT)** segment of the renal tubule between the glomerular capsule and the descending nephron loop; site of most reabsorption and some secretion.

**Puberty** *pu'ber-te* the period at which reproductive organs become functional.

**Pubic** pertaining to the genital region.

**Pubic symphysis** cartilaginous joint formed at the anterior of the two hip bones where the pubis bones articulate.

**Pubis** *pu'bis* most anterior bone of the hip; the pubis from each hip bone meets to articulate at the pubic symphysis joint anteriorly. See *pubic symphysis*.

**Pulmonary circulation** system of blood vessels that carry blood to and from the lungs for gas exchange.

**Pulmonary edema** *ě-de'mab* a leakage of fluid into the air sacs and tissue of the lungs.

**Pulmonary pleura** *ploor'ab* serous membrane layer covering the surface of each lung; also called *visceral pleura*.

**Pulmonary trunk** large artery connecting the right ventricle with the pulmonary arteries.

**Pulp** the part of the tooth that provides nutrients and sensation; composed of blood vessels, connective tissue, and nerves.

**Pulse** the rhythmic expansion and recoil of arteries resulting from heart contraction; can be felt from the outside of the body.

**Pupil** an opening in the center of the iris through which light enters the eye.

**Purkinje fibers** *pur-kin'je* the modified cardiac muscle fibers of the conduction system of the heart that carry impulses to the myocardium.

**Pus** the fluid product of inflammation, composed of white blood cells, the debris of dead cells, and a thin fluid.

**Pyelonephritis** *pi'ë-lo-në-fr'i'tis* an inflammation of the kidney pelvis and surrounding kidney tissues.

**Pyloric valve** valve formed by the pyloric sphincter between the stomach and small intestine.

**Pyramidal tracts** major motor pathways concerned with voluntary movement; connect primary motor area in the frontal lobes of each cerebral hemisphere with the spinal cord; also called *corticospinal tracts*.

**Pyrogen** *pi'ro-jen* an agent or chemical substance that induces fever.

**QRS complex** wave on an ECG representing depolarization of the ventricles.

**Radiant energy** energy of the electromagnetic spectrum, which includes heat, light, ultraviolet waves, infrared waves, and other forms.

**Radioactivity** the process of spontaneous decay seen in some of the heavier isotopes, during which particles or energy is emitted from the atomic nucleus; results in the atom becoming more stable.

**Radioisotope** *ra'de-o-i'si-tōp* isotope that exhibits radioactive behavior.

**Radius** lateral forearm bone; articulates with the capitulum of the humerus at the elbow and the carpals distally.

**Real image** image formed on the retina that is reversed left to right and inverted (upside down) as a result of the refraction bending of light by the lens.

**Receptor** *re-sep'tor* (1) a peripheral nerve ending specialized for response to particular types of stimuli; (2) molecule that binds specifically with other molecules, e.g., hormones and neurotransmitters.

**Receptor-mediated endocytosis** the type of endocytosis in which engulfed particles attach to receptors on the cell surface before endocytosis occurs.

**Rectum** portion of the large intestine between the sigmoid colon and the anal canal.

**Red marrow** bone marrow that is the site of blood cell production; see *hematopoiesis*.

**Reduction** restoring broken bone ends (or a dislocated bone) to its original position.

**Reflex** automatic reaction to a stimulus.

**Refract** bend; usually refers to light.

**Regulatory T cell** type of T lymphocyte that slows or stops activity of B and T cells once the antigenic threat is ended.

**Renin** *re'nin* an enzyme released by the kidneys that is involved with raising blood pressure.

**Renin-angiotensin mechanism** system triggered by low blood pressure or changes to filtrate solute concentrations that results in angiotensin II production and rising blood pressure.

**Repolarization** restoration of the membrane potential to the initial resting (polarized) state.

**Reproductive system** organ system that functions to produce offspring.

**Residual volume** air remaining in the lungs after exhalation that cannot be voluntarily exhaled.

**Resistance exercise** refers to building muscle mass and strength; also called *isometric exercise*.

**Respiration** the process of supplying the body with oxygen and removing carbon dioxide; includes both internal and external respiration.

**Respiratory membrane (air-blood barrier)** membrane composed of the alveolar wall, the capillary wall, and their basement membranes; gases must cross this membrane for proper exchange to occur.

**Respiratory system** organ system that carries out gas exchange; includes the nose, pharynx, larynx, trachea, bronchi, and lungs.

**Respiratory zone** part of the lung that leads into the alveoli and is involved in gas exchange.

**Responsiveness** the ability to sense changes (stimuli) in the environment and then to react to them; see also *irritability*.

**Rete testis** *re'te* structures that carry sperm from the seminiferous tubules to the epididymis.

**Reticular layer** deep layer of the dermis; contains hair follicles, sweat glands, sebaceous glands and is highly vascular.

**Retina** *ret' i-nab* light-sensitive layer (tunic) of the eye; contains rods and cones.

**Rheumatoid arthritis (RA)** chronic inflammatory form of arthritis caused by an autoimmune disorder in which the immune system mistakenly attacks the joints bilaterally. See *arthritis*.

**Ribonucleic acid (RNA)** *ri'bo-nu-kle'ik* the nucleic acid that contains ribose; acts in protein synthesis.

**Ribosomes** *ri'bo-sōmz* cytoplasmic organelles at which proteins are synthesized.

**Rickets** disease in which the bones of children fail to calcify properly, leading to bowing of the leg bones.

**Rods** one of the two types of photosensitive cells in the retina.

**Round ligaments** ligaments that anchor the uterus to the pelvis anteriorly.

**Round window** inferior, membrane-covered opening in the middle ear wall between the vestibule and the cochlea.

**Rule of nines** method of computing the extent of burns by dividing the body into 11 areas, each accounting for 9 percent of the total body area plus an area around the genitals representing 1 percent of the body.

**Sacral** *sa'krul* referring to the lower portion of the back, just superior to the buttocks at the base of the spine.

**Sacrum** *sa'krum* bone made up of five fused bones; forms the posterior of the pelvis.

**Saddle joint** biaxial synovial joint in which both articulating bones have both convex and concave surfaces.

**Sagittal section (plane)** *saj' i-tal* a longitudinal (vertical) plane that divides the body or any of its parts into right and left portions.

**Sagittal suture** interlocking joint formed by the intersection of the two parietal bones at the midline of the skull.

**Salivary amylase** enzyme in saliva that begins the digestion of starch.

**Salivary glands** three pairs of glands that produce a mixture of mucus and serous fluid containing the enzyme salivary amylase, lysozyme, and IgA antibodies.

**Salt** ionic compound that dissociates into charged particles (other than hydrogen or hydroxyl ions) when dissolved in water.

**Sarcomere** *sar'ko-mēr* the smallest contractile unit of muscle; extends from one Z disc to the next.

**Sarcoplasmic reticulum** specialized smooth endoplasmic reticulum found in muscle cells that stores and releases calcium during muscle contraction.

**Satellite cell** type of neuroglia in the PNS; protects and cushions peripheral nerve cell bodies.

**Scapula** *skap'u-lub* triangular bone of the pectoral girdle that articulates with the clavicle and humerus.

**Schwann cell** type of neuroglia in the PNS; many Schwann cells form the myelin sheath on a single neuron.

**Sclera** *skle'rab* the firm white fibrous outer layer of the eyeball; protects and maintains eyeball shape.

**Scoliosis** *sko'le-o'sis* the abnormal curvature of the spine in a lateral direction.

**Scrotum** *skro'tum* a divided sac that suspends the testes outside the body at the root of the penis.

**Sebaceous glands** *seh-ba'shus* glands that empty their sebum secretion into hair follicles.

**Sebum** *se'bum* the oily secretion of sebaceous glands.

**Second messenger** intracellular molecule generated by binding of a chemical to a membrane receptor; mediates intracellular responses.

**Secondary curvatures** spinal curvatures in the cervical and lumbar regions that develop after birth.

**Secondary humoral response** second and subsequent responses of the humoral arm of the immune system to a previously met antigen; more rapid and more vigorous than the primary response.

**Secondary oocyte** the developing oocyte after the first meiotic division; the cell that gets ovulated.

**Secondary sex characteristics** anatomical features that develop under influence of sex hormones that are not directly involved in the reproductive process. Include male or female pattern of muscle development, bone growth, body hair, etc.

**Secretion** *se-kre'shun* (1) the passage of material formed by a cell to its exterior; (2) cell product that is transported to the cell exterior.

**Segmentation** the mixing of foodstuffs by the alternating contraction and relaxation of the circular muscle layer in the muscularis externa of the gastrointestinal tract.

**Selective permeability** characteristic exhibited by a barrier, such as a membrane, that allows some substances through and excludes others.

**Semen** *se'men* fluid mixture produced by male reproductive structures; contains sperm, nutrients, and mucus.

**Semicircular canals** circular canals of the inner ear situated in three different planes; location of dynamic equilibrium receptors.

**Semilunar valves** *sem'i-lu'nar* valves that prevent blood return to the ventricles after contraction; see *pulmonary valve* and *aortic valve*.

**Seminal vesicles** *sem'i-nul* glands located at the base of the bladder that contribute to semen by providing a food source for sperm.

**Seminiferous tubules** *sem'i-nif'er-us* highly convoluted tubes within the testes that form sperm.

**Sensory division** the part of the PNS that sends sensory input to the CNS from sensory receptors around the body; also called *afferent division*.

**Serosa** outermost layer of the gastrointestinal tract; also called the *visceral peritoneum*.

**Serous fluid** *ser'us* a clear, watery fluid secreted by the cells of a serous membrane.

**Serous membrane** membrane that lines a cavity without an opening to the outside of the body (except for joint cavities, which have a synovial membrane); serosa.

**Serous pericardium** double-layered serous membrane deep to the fibrous pericardium; the layers secrete serous fluid to reduce friction as the heart beats.

**Serum** the fluid portion of plasma minus clotting proteins.

**Sinoatrial (SA) node** *si'no-a'tre-al* the mass of specialized myocardial cells in the wall of the right atrium; pacemaker of the heart.

**Sinus** *si'nus* (1) a mucous membrane-lined, air-filled cavity in certain cranial bones; (2) a dilated channel for passage of blood or lymph.

**Skeletal muscle** muscle composed of cylindrical multinucleate cells with obvious striations; the muscle(s) attached to the body's skeleton; also called *voluntary muscle*.

**Skeletal system** system of protection and support composed primarily of bone and cartilage.

**Skull** component of the axial skeleton containing cranium (bony enclosure for the brain) and facial bones.

**Small intestine** segment of the gastrointestinal tract between the stomach and large intestine; site where most absorption occurs.

**Smooth (visceral) muscle** muscle consisting of spindle-shaped, unstriated (nonstriated) muscle cells; involuntary muscle.

**Soft palate** portion of the roof of the mouth that is not supported by bone.

**Solute** *sol'yoot* the dissolved substance in a solution.

**Solute pump** protein carrier involved in active transport.

**Solution** a homogenous mixture of two or more components.

**Solvent** the substance present in the largest amount in a solution.

**Somatic nervous system** *so-mat'ik* a division of the peripheral nervous system; also called the *voluntary nervous system*.

**Sperm** mature male sex cell.

**Spermatic cord** a group of blood vessels, nerves, and ducts that are wrapped in a connective tissue sheath that travels through the inguinal canal.

**Spermatids** *sper'mab-tidz* gametes after the second meiotic division that still need to undergo spermiogenesis.

**Spermatogenesis** *sper'mab-to-jen'ě-sis* the process of sperm production in the male; involves meiosis.

**Spermatogonia** *sper'mab-to-go'ne-ab* male stem cells that will produce sperm.

**Spermiogenesis** *sper'me-o-gen'ě-sis* the last stage of sperm development in which all excess cytoplasm is sloughed off and the sperm takes its mature shape.

**Spinal cord** part of the CNS that provides a two-way conduction system to and from the brain; also a major reflex center.

**Spinal nerves** 31 pairs of nerves originating from the spinal cord; formed when the dorsal and ventral roots merge.

**Spinous process** bony projection from the posterior of the vertebral arch.

**Spiral organ of Corti** the location of the hearing receptors in the cochlea.

**Splanchnic nerves** *splan'nik* preganglionic sympathetic neurons that do not synapse at the sympathetic trunk ganglion, but instead synapse at a collateral ganglion anterior to the spinal cord, then innervate the visceral organs.

**Spongy bone** internal layer of bone in flat, short, and irregular bones, and in the epiphyses of long bones.

**Spongy (penile) urethra** the portion of the urethra that travels down the penis and opens to the outside of the body.

**Squamous suture** interlocking joint formed by the intersection of temporal bones with the parietal bones.

**Stapes** *sta'pěz* medial bone of the middle ear; also called the *stirrup*.

**Static equilibrium** *stat'ik e'kwilib're-um* balance concerned with changes in the position of the head.

**Sterility** the inability to produce offspring.

**Sternum** breastbone; flat bone composed of the manubrium, body, and xiphoid process.

**Steroids** *stě'roidz* a specific group of chemical substances including certain hormones and cholesterol.

**Stroke volume (SV)** a volume of blood ejected by a ventricle during systole.

**Submucosa** layer of the gastrointestinal tract just deep to the mucosa that contains blood vessels, nerves, lymphoid tissue (MALT), and lymphatic vessels.

**Sudoriferous glands** *su'do-rif'er-us* the glands that produce a saline solution called sweat

**Sulcus** *sul'kus* a furrow on the brain, less deep than a fissure.

**Superior vena cava** large vein that carries blood from veins superior to the diaphragm back to the right atrium.

**Sural** *soo'ral* related to the posterior leg; calf.

**Surfactant** *sur-fak'tant* a chemical substance coating the pulmonary alveoli walls that reduces surface tension, thus preventing collapse of the alveoli after expiration.

**Suspensory ligaments** ligaments that secure the ovaries to the lateral walls of the pelvis.

**Swallowing** complex process of moving food from the mouth into the esophagus; involves the buccal and pharyngeal-esophageal phases; also called *deglutition*.

**Sympathetic division** a division of the autonomic nervous system; opposes parasympathetic functions; called the *fight-or-flight division*; also called *thoracolumbar division*.

**Synapse** *sin'aps* the region of communication between neurons, or a neuromuscular junction between a neuron and a muscle cell.

**Synaptic cleft** *sī-nap'tik* the fluid-filled space at a synapse between neurons.

**Synarthrosis** *sin'ar-thro'sis* an immovable joint.

**Synovial fluid** *sī-no've-al* a fluid secreted by the synovial membrane; lubricates joint surfaces and nourishes articular cartilages.

**Synovial joint** freely movable joint exhibiting a joint cavity enclosed by a fibrous capsule lined with synovial membrane.

**Synovial membrane** membrane that lines the fibrous capsule of a synovial joint.

**Synthesis reaction** chemical reaction in which larger molecules are formed from simpler ones.

**Systemic circulation** system of blood vessels that carries nutrient- and oxygen-rich blood to all body organs.

**Systole** *sis'to-le* the contraction phase of heart activity.

**Systolic pressure** *sis-tō'lik* the pressure generated by the left ventricle during systole.

**T cells** lymphocytes that mediate cellular immunity; include helper, cytotoxic, regulatory, and memory cells. Also called *T lymphocytes*.

**T wave** wave on an ECG representing repolarization of the ventricles.

**Tachycardia** *tak'e-kar'de-ab* an abnormal, excessively rapid heart rate; over 100 beats per minute.

**Talus** *tā'lus* ankle bone; articulates with the tibia and calcaneus; allows plantar flexion.

**Tarsal** *tabr'sal* (1) one of the seven bones that form the ankle and heel; (2) relating to the ankle.

**Tectorial membrane** *tek-to're-al* gel-like membrane in the cochlear duct in which the "hairs" of the receptor cells are embedded.

**Tendon** *ten'dun* cord of dense fibrous tissue attaching a muscle to a bone.

**Tendon sheath** elongated bursa that wraps a tendon subject to friction.

**Testis** *tes'tis* the male primary sex organ that produces sperm.

**Testosterone** *tes-tos'tē-rōn* male sex hormone produced by the testes; during puberty promotes virilization and is necessary for normal sperm production.

**Thalamus** *tha'lub-mus* a mass of gray matter in the diencephalon of the brain.

**Thoracic** *tho-ras'ik* refers to the area between the neck and abdomen supported by the ribs, costal cartilages and sternum; chest.

**Thoracic vertebrae** the 12 vertebrae that are in the middle part of the vertebral column and articulate with the ribs.

**Thrombin** *throm'bin* an enzyme that induces clotting by converting fibrinogen to fibrin.

**Thrombus** *throm'bus* a fixed clot that develops and persists in an unbroken blood vessel.

**Thymus** *thi'mus* an endocrine gland active in the immune response.

**Thyroid gland** *thi'roid* one of the largest of the body's endocrine glands; straddles the anterior trachea.

**Tidal volume (TV)** amount of air inhaled or exhaled with a normal breath.

**Tight junction** area where plasma membranes of neighboring cells are tightly bound together, forming an impermeable barrier.

**Tissue** a group of similar cells specialized to perform a specific function; primary tissue types are epithelial, connective, muscle, and nervous tissues.

**Trachea** *tra'ke-ab* The windpipe; the respiratory tube extending from larynx to bronchi.

**Tracheoesophageal fistula** *tra'ke-o-ē-sof' ab-je' al fis'tu-lab* congenital defect in which the esophagus and trachea are connected physically; the esophagus often ends in a blind sac that does not lead to the stomach.

**Tract** a collection of nerve fibers in the CNS having the same origin, termination, and function.

**Transcription** one of the two major steps in protein synthesis; the transfer of information from DNA base sequence to the complementary messenger RNA base sequence.

**Transient ischemic attack (TIA)** the temporary restriction of blood flow to an area of the brain.

**Translation** the second major step in protein synthesis; information carried by messenger RNA is decoded and used to assemble amino acids into a protein.

**Transverse process** lateral bony projection that originates at the vertebral arch; occur in pairs, one on each side.

**Transverse section (plane)** plane that divides the body or its parts into superior and inferior parts; cross section.

**Triglycerides** *tri-glis'er-idz* compounds composed of fatty acids and glycerol; fats and oils; also called neutral fats.

**Trigone** *tri'gon* smooth, triangular region of the bladder formed by the openings of the two ureters and the urethra.

**Trochanter** *tro-kan'ter* a large, somewhat blunt process.

**Tropic hormone** *tro'pik* a hormone that regulates the function of another endocrine organ.

**True ribs** rib pairs 1–7; are attached directly to the sternum via costal cartilage.

**True vocal cords** folds in the mucous membrane of the larynx that vibrate to produce sound; also called *vocal folds*.

**Tubercle** *tu'ber-kul* a nodule or small rounded process.

**Tuberosity** *tu'bē-ros' i-te* a broad process, larger than a tubercle.

**Tubular reabsorption** the process of reclaiming nutrients, ions, and water that the body needs from the filtrate in the renal tubule.

**Tubular secretion** the process of actively moving substances from peritubular blood into the renal tubule for elimination from the body.

**Tunica externa** *tu'nī-kab eks'tern-ab* outermost layer of blood vessel walls made of fibrous connective tissue.

**Tunica intima** *tu'nī-kab in'ti-mab* the innermost lining of blood vessels made of endothelium on a basement membrane; the only layer forming a capillary wall.

**Tunica media** *tu'nī-kab me'de-ab* the middle layer of blood vessel walls containing smooth muscle and elastic fibers.

**Tympanic membrane** *tim-pan'ik* the eardrum.

**Ulna** medial bone of the forearm; articulates with the trochlea of the humerus and the carpals.

**Umbilical** pertaining to the navel area.

**Umbilical cord** *um-bīl' i-kul* a structure bearing arteries and veins connecting the placenta and the fetus.

**Unfused tetanus** *tel'ab-nus* a muscle contraction in which the muscle does not completely relax between stimulation events; causes an increase in force because individual twitches are added together, or summed; also called *incomplete tetanus*.

**Unipolar neuron** structural class of neuron with one process extending from the cell body.

**Urea** *u-re'ab* the main nitrogen-containing waste excreted in the urine.

**Ureters** *yer'ē-terz* tubes that carry urine from kidney to bladder.

**Urethra** *u-re'thrab* the canal through which urine passes from the bladder to the outside of the body.

**Urinary system** system primarily responsible for water, electrolyte, and acid-base balance and the removal of nitrogen-containing wastes from the blood.

**Urine** filtrate containing waste and excess ions excreted by the kidneys.

**Uterine cycle** see *menstrual cycle*.

**Uterine tube** the oviduct: the tube through which the ovum is transported to the uterus; also called *fallopian tube*.

**Uterosacral ligaments** bilateral ligaments that anchor the uterus posteriorly.

**Uterus** *u'ter-us* hollow pelvic organ of the female reproductive system that functions to receive, retain, and nourish a fertilized egg.

**Uvula** *u'vu-lab* tissue tag hanging from soft palate.

**Vaccine** weakened or killed antigen injected into a person for the purpose of stimulating a primary immune response; conveys artificial active immunity; results in immunological memory.

**Vagina** *vab-ji'nab* the female copulatory organ that runs from the cervix to the outside of the body.

**Valence shell** *va'lens* the outermost energy level of an atom that contains electrons; the electrons in the valence shell determine the bonding behavior of the atom.

**Valves** structures that close to prevent backflow of blood in the heart or in large veins.

**Vascular layer** middle layer (tunic) of the eyeball wall that contains the choroid, ciliary body, and iris.

**Vascular shunt** a vessel that directly connects the arteriole and venule of a capillary bed.

**Vasoconstriction** *vās'o-kon-strik'shun* narrowing of blood vessels.

**Vein** *vān* a vessel carrying blood away from the tissues toward the heart.

**Ventral ramus** branch of a spinal nerve that serves the anterior and lateral trunk; ventral rami of spinal nerves T<sub>1</sub>–T<sub>12</sub> form the intercostal nerves; all other ventral rami form the four nerve plexuses.