ANATOMY & PHYSIOLOGY WORD ROOTS, PREFIXES, SUFFIXES, & COMBINING FORMS

cerebro- brain (esp. cerebrum) cerebrospinal (of the brain and

exo- outside, outer layer exophthalmos (abnormal protrusion of

extra- outside, beyond extracellular (outside the cell)

the eye from the orbit)

PREFIXES

spinal cord) **cervic-** neck cervical (of the cervix) a-, an- absence, lack anaerobic (in the absence of oxygen) chiasm- crossing optic chiasma (the point where optic nerves ab- departing from abnormal acou- hearing acoustics (the science of sound) cross) **chole-** *bile* cholecystokinin (a bile-secreting hormone) ac-, acro- extreme, extremity, peak acrodermatitis (inflammation chondr- cartilage chondrogenic (giving rise to cartilage) of the skin of the extremities) chrom- colored chromosomes, which stain darkly **ad-** to, toward adorbital (toward the orbit) aden-, adeno- gland adeniform (resembling a gland in shape) cili- small hair ciliated epithelium circum- around circumnuclear (surrounding the nucleus) adren- toward the kidney adrenal gland, located adjacent to the **clavic-** key clavicle (a "skeleton key") kidnev co-, con- together concentric aero- air aerobic respiration coccy- cuckoo coccyx, which is beak-shaped af- toward afferent neurons, which carry impulses to CNS agon- contest agonistic and antagonistic muscles **coel-** *hollow* coelom (the ventral body cavity) commis- united commissures (connections between the two alb- white corpus albicans of the ovary (white scar tissue) hemispheres of the brain) aliment- nourish alimentary canal (digestive tract) contra- against, opposite contraceptive (preventing conception) **allel-** of one another alleles (alternative gene expressions) corn-, cornu- horn stratum corneum (the outer layer of the amphi- both, on two sides amphibian (living both in water and skin) on land) corp- body corpse ana- apart, up, again anaphase (phase of mitosis in which chro**cort-** bark cortex (the outer layer of the brain and kidney) mosomes separate) anastomos- come together arteriovenous anastomosis (connec**cost-** *rib* intercostal (between the ribs) tion between an artery and a vein) **crani-** skull craniotomy (skull operation) **crypt-** *hidden* cryptochidism (non-descent of the testes) angi- vessel angiitis (inflammation of a lymph or blood vessel) angin- choked angina pectoris (choked feeling in the chest) cusp- pointed bicuspid valves of the heart ${f cutic-}$ skin cuticle of the nail ant-, anti- opposed to, inhibiting anticoagulant (substance that **cvan-** blue cyanosis (blue skin color due to lack of oxygen) prevents blood coagulation) ante-preceding, before antecubital (in front of the elbow) cyst- sac, bladder cystitis (inflammation of urinary bladder) **cyt-** *cell* cytology (study of the cell) aort- great artery aorta of the heart de- reversal, loss deactivation ap-, api- tip, extremity apex of the heart decid-falling off deciduous (milk) teeth append- hang appendicular skeleton aqua-, aque- water aqueous solution den-, dent- tooth dentin of the tooth areola- open space areolar connective tissue **dendr-** tree, branch dendrites (branches of the neuron) arrect- upright arrector pilli muscles, which make hairs stand **derm-** *skin* dermis (the deep layer of skin) desm- bond desmosome, which binds adjacent epithelial cells erect arthr-, arthro- joint arthropathy (any joint disease) di- twice, double dimorphic (having two forms) artic- joint articular surfaces of bones (connection points) dia- through, between diaphragm (wall between two areas) dialys- separate, break apart kidney dialysis, in which waste is atri- vestibule atria (upper chambers of the heart) auscult- listen ausculatory method for measuring blood pressure removed from the blood diastol- stand apart cardiac diastole (the space between succesaut-, auto- self autogeneous (self-generated) ax-, axi-, axo- axis, axle axial skeleton sive contractions of the heart) azyg- unpaired azygous organ (unpaired structure) diure- urinate diuretic (drug that increases urine output) baro- pressure baroreceptors, which monitor blood pressure dors- the back dorsal, dorsum duc-, duct- lead, draw ductus deferens (the tube that carries **bi-** two bicuspid (having two cusps) **bili-** bile bilirubin (a bile pigment) sperm into the urethra) dys- difficult, faulty dyspepsia (disturbed digestion) bio- life biology (study of life) blast- bud, germ blastocyte (undifferentiated embryonic cell) ec-, ex-, ecto- out, outside excrete (to remove from the body) brachi- arm brachial plexus of PNS supplies the arm ectop- displaced ectopic pregnancy, which occurs outside of the **brady-** slow bradycardia (abnormally slow heart rate) brev- short fibularis brevis (a short leg muscle) edem- swelling edema (accumulation of water in body tissues) ef- away efferent nerve fibers, which carry impulses away from broncho- bronchus bronchospasm (spasmodic contraction of bronchial muscle) **bucco-** cheek buccolabial (pertaining to cheek and lip) ejac- to shoot forth ejaculation of semen calor- heat calories (unit of energy) embol- wedge embolus (obstructive object in bloodstream) en-, em- in, inside encysted (enclosed in cyst or capsule) capill- hair capillaries (smallest blood vessels) **enceph-** brain encephalitis (inflammation of the brain) **caput-** head decapitate (to remove the head) carcin- cancer carcinogenic (causes cancer) endo- within, inner endocytosis (taking of particles into a cell) cardi-, cardio- heart cardiotoxic (harmful to the heart) entero- intestine enterologist (one who studies intestinal disorcarneo- flesh trabeculae carnae (muscle ridges in the ventricles ders) of the heart) epi- over, above epidermis (the outer layer of skin) carot- carrot carotene (orange pigment) erythr- red erythrocyte (red blood cell) carot- stupor carotid artery, blockage of which causes fainting) eso- within esophagus cata- down catabolism (chemical breakdown) eu- well euesthesia (normal state of the senses) **caud-** tail caudal (directional term) excret- separate excretory system

cec-blind cecum of large intestine, which is a blind-ended pouch

cephal- head cephalometer (instrument that measures the head)

cele- abdominal celiac artery, located in the abdomen

extrins- from the outside extrinsic regulation of the heart leuko- white leukocyte (white blood cell) fasci-, fascia- bundle, band superficial and deep fascia leva- raise, elevate levator labii superioris (muscles that elevates ${f fenestr-}\ window\ {f fenestrated}\ {f capillaries}$ the upper lip) ferr- iron ferritin (an iron storage protein) lingua- tonque lingual tonsil, which is adjacent to the tongue flagell- whip flagellum (tail of a sperm cell) lip-, lipo- fat, lipid lipophage (cell with fat in its cytoplasm) flat- blow, blown flatulence **lith-** stone cholelithiasis (gallstones) folli- bag, bellows hair follicle **luci-** clear stratum lucidum (clear layer of the epidermis) fontan- fountain fontanelles of the fetal skull lut- yellow corpus luteum (yellow, hormone-secreting structure in foram- opening foramen magnum of the skull the ovary) macro- large macromolecule (large molecule) foss- ditch fossa ovalis of the heart gam-, gamet- married, spouse gametes (sex cells) magn- large foramen magnum (largest opening of the skull) gangli- swelling, knot dorsal root ganglia of the spinal nerves mal- bad, abnormal malfunction (abnormal functioning of an orgastr- stomach gastrin (a hormone related to gastric acid secregan) mamm- breast mammary gland germin- grow germinal epithelium of the gonads mast- breast mastectomy (removal of a mammary gland) gero-, geront- old man gerontology (study of aging) meat- passage external acoustic meatus (the ear canal) gest- carried gestation (the period between conception and birth) **medi-** *middle* medial (directional term) glauc- gray glaucoma, which causes gradual blindness medull- marrow medulla (middle portion of the kidney) glom- ball glomeruli (capillary clusters in the kidneys) mega- large megakaryocyte (large precursor cell of platelets) glosso- tongue glossopathy (any disease of the tongue) meio- less meiosis (nuclear division that halves the number of gluco-, glyco- sweet glycolysis (breakdown of glucose) chromosomes) **glute-** buttock gluteus maximus (largest buttock muscle) melan- black melanocytes, which secrete the black pigment gnost- knowing gnostic sense (awareness of self) melanin) gompho- nail gomphosis (joint between tooth and jaw) men-, menstru- month menses (cyclic menstrual flow) gon-, gono- seed, offspring gonads (the sex organs) meningo- membrane meningitis (inflammation of the membranes gust- taste gustatory sense (sense of taste) of the brain) hapt- fasten, grasp hapten (a partial antigen) mer-, mero- a part merocrine glands, whose secretions do not hema-, hemo- blood hematoma (mass of clotted blood) include the cell hemato- blood hematocyst (cyst containing blood) meso- middle mesoderm (middle germ layer) hemi- half hemiglossal (pertaining to one half of the tongue) meta- beyond, between metatarsus (part of the foot between the **hepta-** *liver* hepatitis (inflammation of the liver) tarsus and phalanges) hetero- different, other heterogeneous metro- uterus endometrium (lining of the uterus) hiat- qap hiatus of the diaphragm (opening for esophagus) micro- small microscope (instrument for looking at very small hippo- horse hippocampus of the brain, which is shaped like a mictur- urinate micturition (the act of voiding the bladder) seahorse mito- thread, filament mitochondria (filament-like structures in **hirsut-** hairy hirsutism (excessive body hair) **hist-** tissue histology (study of tissues) cells) holo- whole holocrine glands, whose secretions are whole cells mnem- memory amnesia (loss of memory) hom-, homo- same homocentric (having the same center) mono- single monoglyceride (a single-sugar carbohydrate) hormon- to excite hormones morpho- form morphology (study of form and structure) humor- a fluid humoral immunity (immunity via antibodies in muliti- many multinuclear (having several nuclei) mur- wall intramural (within a body or an organ) body fluids) hyal- glass, clear hyaline cartilage, which has no visible fibers muta- change mutation (a change in base sequence of DNA) hydr-, hydro- water dehydration (loss of body water) myelo- spinal cord, marrow myeloblasts (bone marrow cells) hyper- excess hypertension (excessive tension) myo- muscle myocardium (heart muscle) **hypno-** *sleep* hypnosis (sleep-like state) **nano-** dwarf nanometer (one-billionth of a meter) hyster-, hystero- uterus, womb hysterectomy (removal of the narco- numbness narcotic (a drug producing stupor or numbed sensations) uterus) ile- intestine ileum (last portion of the small intestine) natri- sodium atrial natrieuretic peptide (a sodium-regulating **im-** *not* impermeable (not permeable) hormone) necro- death necrosis (tissue death) inter- between intercellular (between cells) neo- new neoplasm (an abnormal growth) intercal- insert intercalated discs (connections between heart **nephro-** *kidney* nephritis (inflammation of the kidney) muscle cells) intra- within, inside intracellular (inside the cell) **neuro-** nerve neurophysiology (physiology of the nervous system) noci- harmful nocireceptors (pain receptors) iso- equal, same isothermal (at the same temperature) jugul- throat jugular veins **nom-** name innominate artery juxta- near, close to juxtaglomerular complex (cell cluster next noto- back notochord (embryonic structure preceding the verteto a glomerulus) bral column) karyo- kernel, nucleus karyotype (assemblage of nuclear chromonucle- pit, kernel nucleus nutri- feed, nourish nutrition somes) **kera-** horn keratin (water-repellent protein of the skin) **ob-** before, against obstruction oculo- eye monocular (pertaining to one eye) **kilo-** thousand kilocalorie (one thousand calories) kin-, kines- move kinetic energy odonto- teeth orthodontist labi-, labri lip labial frenulum (membrane joining lip to gum) olfact- smell olfactory nerves lact- milk lactose (milk sugar) oligo- few oligodendrocytes (neuroglial cells with few branches) lacun- space, cavity, lake lacunae (spaces occupied by cartilage **onco-** *a mass* oncology (study of cancer)

lamell- small plate concentric lamellae (bone matrix rings in com-

lat- wide latissimus dorsi (a broad back muscle) laten- hidden latent period of a muscle twitch

later- side lateral (directional term)

and bone cells)

pact bone)

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diseases)

org- living organism

oo- egg oocyte (precursor of female gamete)

ophthalmo- eye ophthalmology (study of the eyes and related

orb- circular orbicularis oculi (muscle that encircles the eye)

orchi- testis cryptorchidism (non-descent of the testes)

 ${f ortho-}\ straight$ orthopedic (correcting of musculoskeletal deforsens- feeling sensation, sensory septi- rotten sepsis (infection) mities) osm- smell anosmia (loss of sense of smell) sero- serum-related serological tests, which assess blood condiosmo- pushing osmosis osteo- bone osteodermia (bony formations in the skin) serrat- saw serratus anterior (a chest wall muscle with a jagged **oto-** ear otoscope (device for examining the ear) ov-, ovi- eqq ovum, oviduct sin-, sino- a hollow sinuses of the skull soma-body somatic nervous system **oxy-** oxygen oxygenation (saturation of substance with oxygen) pan- all, universal panacea (a cure-all) somn- sleep insomnia (inability to sleep) papill- nipple dermal papillae (projections of dermis into epidersphin- squeeze sphincter mis) splanchn- organ splanchnic nerve, which supplies the abdominal para- beside, near paranuclear (beside the nucleus) spondyl- vertebra ankylosing sponylitis (rheumatoid arthritis of pect- breast pectoralis major (a large chest muscle) pelv- a basin pelvic girdle, which cradles the pelvic organs the spine) squam- scale, flat squamous epithelium **peni-** tail penis penna- feather bipennate muscles, whose fascicles have a feathsteno- narrow stenosis (abnormal narrowing of a blood vessel or ered appearance valve) **pent-** *five* pentose (a 5-carbon sugar) **strat-** *layer* strata of the epidermis pep-, peps-, pept- digest pepsin (a digestive enzyme) stria- furrow, streak striations of skeletal and cardiac muscle tisper-, permea- through permeable (can be passed through) sub- beneath, under sublingual (beneath the tongue) **peri-** around perianal (situated around the anus) phago- eat phagocyte (cell that engulfs and digests particles or **sucr-** sweet sucrose (table sugar) sudor- sweat sudoriferous glands (sweat glands) cells) **pheno-** show, appear phenotype (physical appearance) super- above, upon superior (above something) **phleb-** vein phlebitis (inflammation of the veins) **supra-** above, upon supracondylar (above a condyle) pin-, pino- drink pinocytosis (engulfing of small particles by a sym-, syn- together synapse (region of communication between two neurons) platy- flat, broad platysma (a broad, flat neck muscle) synerg- work together synergism pleur- side, rib pleural serosa (membrane lining the thoracic cavsystol- contraction systole (contraction of the heart) tachy- rapid tachycardia (abnormally rapid heartbeat) plex- net, network brachial plexus (network of nerves that suptact- touch tactile sense plies the arm) telo- the end telophase (last phase of mitosis) **pneumo-** air pneumothorax (air in the thoracic cavity) templ-, tempo- time temporal summation of nerve impulses pod- foot podiatry (treatment of foot disorders) tens- stretched muscle tension \mathbf{poly} - multiple polymorphism (having multiple forms) terti- third fibularis tertius (one of three fibularis muscles) **post-** after, behind posterior (behind a specific part) tetan rigid tetanus of the muscles **pre-**, **pro-** before, ahead of prenatal (before birth) **therm-** *heat* thermometer procto- rectum, anus proctoscope (instrument for examining the thromb- clot thrombocytopenia, thrombus rectum) thyro- a shield thyroid gland **pron-** bent forward prone, pronate tissu- woven tissue propri- one's own proprioception (awareness of body parts and tono- tension tonicity, hypertonic movement) tox- poison toxicology (study of poisons) **pseudo-** false pseudotumor (false tumor) trab- beam, timber trabeculae (spicules of bone in spongy bone **psycho-** mind, psyche psychogram (chart of personality traits) ptos- fall ptosis (upper eyelid droop) trans- across, through transpleural (through the pleura) pub- of the pubis puberty trapez- table trapezius (four-sided muscle of the upper back) tri- three trifurcation (division into three branches) **pulmo-** lung pulmonary artery, which carries blood to the lungs **pyo-** pus pyocyst (a cyst that contains pus) trop- turn, change tropic hormones, which target endocrine pyro- fire pyrogen (a fever-inducing substance) troph- nourish trophoblast, from which the fetal portion of plaquad-, quadr- four-sided quadratus lumborum (a square-shaped muscle) centa develops re- back, again reinfect tuber- swelling tuberosity (bump on a bone) rect- straight rectus abdominis, rectum tunic- covering tunica albuginea (covering of the testis) ren- kidney renin (enzyme secreted by the kidney) **tympan-** drum tympanic membrane (the eardrum) retin-, retic- net, network endoplasmic reticulum (a network of ultra- beyond ultraviolet radiation membranous sacs in a cell) vacc- cow vaccines, the first of which were made from cowpox retro- backward, behind retrogression (to move backward in devagin- a sheath vagina velopment) **valen-** strenath valence shell rheum- watery flow, flux rheumatoid arthritis, rheumatic fever venter-, ventr- abdomen, belly ventral (directional term), venrhin-, rhino- nose rhinitis (inflammation of the nose) tricle ruga- fold, wrinkle rugae (folds of the stomach, gallbladder, and vent- wind pulmonary ventilation urinary bladder) vert- turn vertebral column sagitt- arrow sagittal (directional term) vestibul- a porch vestibule (anterior entryway to mouth and salta- leap saltatory spasm (sudden, violent, involuntary muscle vibr- shake, quiver vibrissae (hairs of the nasal vestibule) contraction) sanguin- blood sanguine (the color of dried blood) viscero- organ, viscera visceroinhibitory (inhibiting of visceral sarco- flesh sarcomere (unit of contraction in skeletal muscle) movement) saphen- visible, clear great saphenous vein (superficial vein of viscos- sticky viscosity (resistance to flow) the thigh and leg) vita- life vitamin sclero- hard sclerosis (stiffening of a tissue or organ) vitre- glass vitreous humor (clear jelly of the eye) seb- grease sebum (skin oil) ${f viv-}\ live\ {f in}\ {f vivo}$

vulv- a covering vulva (female external genitalia)

 $\mathbf{semi-}\ half\ \mathrm{semicircular}$

COMBINING FORMS

aneurysm a widening aortic aneurysm, in which a weak spot causes enlargement of blood vessel

arbor tree arbor vitae of the cerebellum (treelike pattern of
white matter)

 ${\bf basal}\ \ basal\ \ basal\ \ lamina$ of epithelial basement membrane

cervix neck cervix of the uterus

 ${f cochlea}$ snail shell ${f cochlea}$ of the inner ear, which is coiled like a snail shell

concha shell nasal conchae (coiled shelves of bone in nasal cavity)

corona crown coronal suture of the skull

delta triangular deltoid muscle

dura hard dura matter (tough outer meninx)

gene beginning genetics

 ${\bf lamina}\ layer,\ sheet\ {\bf basal}\ lamina\ of\ the\ epithelial\ basement\ membrane$

lumen *light* lumen (center of a hollow structure)

lymph water lymphatic circulation (return of clear fluid to the bloodstream)

macula spot macula lutea (yellow spot on the retina)

mater mother dura mater (a membrane that envelops the brain) pectus breast pectoralis major (a large chest muscle)

pia tender, gentle pia mater (delicate inner membrane around the brain and spinal cord)

 $\mathbf{pili}\ hair$ arrector pili muscles of the skin, which make hairs stand erect

plexus net, network brachial plexus (network of nerves that supplies the arm)

 \mathbf{semen} seed, sperm semen (discharge of the male reproductive \mathbf{system})

septum fence nasal septum

stroma *mattress* stroma (connective tissue framework of some organs)

vagus wanderer the vagus nerve, which travels from the brain into the abdominopelvic cavity

vas vessel, duct vasoconstriction, vas deferens

villus shaggy hair microvilli, which appear like hairs in light microscopy

SUFFIXES

- -able $able\ to,\ capable\ of\ viable\ (able\ to\ exist)$
- -ac referring to cardiac (referring to the heart)
- -algia pain in a certain part neuralgia (pain along the course of a nerve)
- -apsi juncture synapse (where two neurons communicate)
- -ary associated with coronary (associated with the heart)
- -asthen weakness myastheia gravis (a disease involving paralysis)
- -blast bud, germ osteoblast
- -bryo swollen embryo
- -cide destroy or kill germicide (an agent that kills germs)
- -cipit head occipital
- -clast break osteoclast (a cell that dissolves bone matrix)
- -crine separate endocrine organs, which secrete hormones into the blood
- $\mbox{-}\mbox{\bf cyte}$ cellosteocyte, adipocyte
- -dips thirst, dry polydipsia (excessive thirst associated with diabetes)
- -ectomy $cutting\ out$ appendectomy (surgical removal of the appendix)
- -ell, -elle small organelle
- -emia condition of the blood anemia (deficiency of red blood cells)
- -esthesi sensation anaesthesia (lack of sensation)

- -ferrent carry efferent nerves, which carry impulses away from the CNS
- -form, -forma shape cribriform plate of the ethmoid bone
- -fuge driving out vermifuge (a substance that expels worms of the intestine)
- -gen an agent that initiates pathogen (any disease-producing agent)
- -glea, -glia glue neuroglia (connective tissue of the nervous system)
- **-gram** a record, data electrocardiogram (recording showing action of the heart)
- **-graph** instrument for recording data electrocardiograph (instrument used to make electrocardiograms)
- -ia condition insomnia (condition of not being able to sleep)
- -iatrics medical specialty geriatrics (branch of medicine dealing with old age and associated diseases)
- -ism condition hyperthyroidism
- -itis inflammation gastritis (inflammation of the stomach)
- -lemma sheath, husk sarcolemma (plasma membrane of a muscle cell)
- -logy study of pathology (the study of disease)
- -lysis loosening, breaking down hydrolysis (chemical decomposition that takes up water)
- -malacia soft osteomalacia (a process that leads to bone softening)
- -mania obsession, compulsion erotomania (exaggeration of the sexual passions)
- -nata birth prenatal (before birth)
- **-nom** *qovern* autonomic nervous system
- -odyn pain coccygodynia (pain in the coccyx region)
- -oid like, resembling cuboid (shaped like a cube)
- -oma tumor lymphoma (a tumor of the lymphatic tissues)
- -opia of the eye myopia (nearsightedness)
- **-ory** referring to, of auditory (related to hearing)
- -pathy disease osteopathy (any disease of the bone)
- -phasia speech aphasia (lack of ability to speak)
- -phil, -philo like hydrophilic (water-loving)
- -phobia fear acrophobia (fear of heights)
- -phragm partition diaphragm, which separates the thoracic and abdominal cavities
- -phylax guard, preserve prophylaxis (to guard in advance, as in preventative treatment)
- -plas *grow* neoplasia (an abnormal growth)
- -plasm form, shape cytoplasm
- -plasty reconstruction of a part rhinoplasty (surgical reconstruction of the nose)
- -plegia paralysis paraplegia (paralysis of the lower half of the body or lower limbs)
- -rrhagia flow, discharge diarrhea (abnormal emptying of the bowels)
- **-scope** instrument of examination stethoscope (instrument used to listen to body sounds)
- -some body chromosome
- -sorb suck in absorb
- -stalsis compression, constriction peristalsis (muscular contractions that propel food along the digestive tract)
- -stasis arrest, fixation hemostasis (arrest of bleeding)
- -stitia come to stand interstitial fluid, which exists between cells
- **-stomy** make an artificial opening enterostomy (formation of an artificial opening into the intestine through the abdominal wall)
- -tegm to cover integumentary (of the skin and other body coverings)
- **-tomy** to cut appendectomy (surgical removal of the appendix)
- -trud thrust detrusor muscle
- -ty condition of, state immunity (condition of resistance to infection)
- -uria urine polyuria (passage of an excessive amount of urine)
- -zyme ferment enzyme