

# A&P Key Terms

## 03 Cellular

### Level of

# Organization

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## 4. Chapter: A&P Key Terms 03 Cellular Level of Organization

### 1. A&P Key Terms 03 Cellular Level of Organization Questions

<u>active transport</u>	form of transport across the cell membrane that requires input of cellular energy
<u>amphipathic</u>	describes a molecule that exhibits a difference in polarity between its two ends, resulting in a difference in water solubility
<u>anaphase</u>	third stage of mitosis (and meiosis), during which sister chromatids separate into two new nuclear regions of a dividing cell
<u>anticodon</u>	consecutive sequence of three nucleotides on a tRNA molecule that is complementary to a specific codon on an mRNA molecule
<u>autolysis</u>	breakdown of cells by their own enzymatic action
<u>autophagy</u>	lysosomal breakdown of a cell's own components
<u>cell cycle</u>	life cycle of a single cell, from its birth until its division into two new daughter cells
<u>cell membrane</u>	membrane surrounding all animal cells, composed of a lipid bilayer interspersed with various molecules; also known as plasma membrane
<u>centriole</u>	small, self-replicating organelle that provides the origin for microtubule growth and moves DNA during cell division
<u>centromere</u>	region of attachment for two sister chromatids
<u>centrosome</u>	cellular structure that organizes microtubules during cell division
<u>channel protein</u>	membrane-spanning protein that has an inner pore which allows the passage of one or more substances
<u>checkpoint</u>	progress point in the cell cycle during which certain conditions must be met in order for the cell to proceed to a subsequent phase
<u>chromatin</u>	substance consisting of DNA and associated proteins
<u>chromosome</u>	condensed version of chromatin
<u>cilia</u>	small appendage on certain cells formed by microtubules and modified for movement of materials across the cellular surface

<u>cleavage furrow</u>	contractile ring that forms around a cell during cytokinesis that pinches the cell into two halves
<u>codon</u>	consecutive sequence of three nucleotides on an mRNA molecule that corresponds to a specific amino acid
<u>concentration gradient</u>	difference in the concentration of a substance between two regions
<u>cyclin-dependent kinase (CDK)</u>	one of a group of enzymes associated with cyclins that help them perform their functions
<u>cyclin</u>	one of a group of proteins that function in the progression of the cell cycle
<u>cytokinesis</u>	final stage in cell division, where the cytoplasm divides to form two separate daughter cells
<u>cytoplasm</u>	internal material between the cell membrane and nucleus of a cell, mainly consisting of a water-based fluid called cytosol, within which are all the other organelles and cellular solute and suspended materials
<u>cytoskeleton</u>	"skeleton" of a cell; formed by rod-like proteins that support the cell's shape and provide, among other functions, locomotive abilities
<u>cytosol</u>	clear, semi-fluid medium of the cytoplasm, made up mostly of water
<u>DNA polymerase</u>	enzyme that functions in adding new nucleotides to a growing strand of DNA during DNA replication
<u>DNA replication</u>	process of duplicating a molecule of DNA
<u>diffusion</u>	movement of a substance from an area of higher concentration to one of lower concentration
<u>diploid</u>	condition marked by the presence of a double complement of genetic material (two sets of chromosomes, one set inherited from each of two parents)
<u>electrical gradient</u>	difference in the electrical charge (potential) between two regions
<u>endocytosis</u>	import of material into the cell by formation of a membrane-bound vesicle
<u>endoplasmic reticulum (ER)</u>	cellular organelle that consists of interconnected membrane-bound tubules, which may or may not be associated with ribosomes (rough type or smooth type,

	associated with ribosomes (rough type or smooth type, respectively)
<u>exocytosis</u>	export of a substance out of a cell by formation of a membrane-bound vesicle
<u>exon</u>	one of the coding regions of an mRNA molecule that remain after splicing
<u>extracellular fluid (ECF)</u>	fluid exterior to cells; includes the interstitial fluid, blood plasma, and fluid found in other reservoirs in the body
<u>facilitated diffusion</u>	diffusion of a substance with the aid of a membrane protein
<u>flagellum</u>	appendage on certain cells formed by microtubules and modified for movement
<u>G0 phase</u>	phase of the cell cycle, usually entered from the G1 phase; characterized by long or permanent periods where the cell does not move forward into the DNA synthesis phase
<u>G1 phase</u>	first phase of the cell cycle, after a new cell is born
<u>G2 phase</u>	third phase of the cell cycle, after the DNA synthesis phase
<u>Golgi apparatus</u>	cellular organelle formed by a series of flattened, membrane-bound sacs that functions in protein modification, tagging, packaging, and transport
<u>gene expression</u>	active interpretation of the information coded in a gene to produce a functional gene product
<u>gene</u>	functional length of DNA that provides the genetic information necessary to build a protein
<u>genome</u>	entire complement of an organism's DNA; found within virtually every cell
<u>glycocalyx</u>	coating of sugar molecules that surrounds the cell membrane
<u>glycoprotein</u>	protein that has one or more carbohydrates attached
<u>helicase</u>	enzyme that functions to separate the two DNA strands of a double helix during DNA replication
<u>histone</u>	family of proteins that associate with DNA in the nucleus to form chromatin



	nucleus to form chromatin
<u>homologous</u>	describes two copies of the same chromosome (not identical), one inherited from each parent
<u>hydrophilic</u>	describes a substance or structure attracted to water
<u>hydrophobic</u>	describes a substance or structure repelled by water
<u>hypertonic</u>	describes a solution concentration that is higher than a reference concentration
<u>hypotonic</u>	describes a solution concentration that is lower than a reference concentration
<u>integral protein</u>	membrane-associated protein that spans the entire width of the lipid bilayer
<u>intermediate filament</u>	type of cytoskeletal filament made of keratin, characterized by an intermediate thickness, and playing a role in resisting cellular tension
<u>interphase</u>	entire life cycle of a cell, excluding mitosis
<u>interstitial fluid (IF)</u>	fluid in the small spaces between cells not contained within blood vessels
<u>intracellular fluid (ICF)</u>	fluid in the cytosol of cells
<u>intron</u>	non-coding regions of a pre-mRNA transcript that may be removed during splicing
<u>isotonic</u>	describes a solution concentration that is the same as a reference concentration
<u>kinetochore</u>	region of a centromere where microtubules attach to a pair of sister chromatids
<u>ligand</u>	molecule that binds with specificity to a specific receptor molecule
<u>lysosome</u>	membrane-bound cellular organelle originating from the Golgi apparatus and containing digestive enzymes
<u>messenger RNA (mRNA)</u>	nucleotide molecule that serves as an intermediate in the genetic code between DNA and protein
<u>metaphase plate</u>	linear alignment of sister chromatids in the center of the cell, which takes place during metaphase

<u>metaphase</u>	second stage of mitosis (and meiosis), characterized by the linear alignment of sister chromatids in the center of the cell
<u>microfilament</u>	the thinnest of the cytoskeletal filaments; composed of actin subunits that function in muscle contraction and cellular structural support
<u>microtubule</u>	the thickest of the cytoskeletal filaments, composed of tubulin subunits that function in cellular movement and structural support
<u>mitochondrion</u>	one of the cellular organelles bound by a double lipid bilayer that function primarily in the production of cellular energy (ATP)
<u>mitosis</u>	division of genetic material, during which the cell nucleus breaks down and two new, fully functional, nuclei are formed
<u>mitotic phase</u>	phase of the cell cycle in which a cell undergoes mitosis
<u>mitotic spindle</u>	network of microtubules, originating from centrioles, that arranges and pulls apart chromosomes during mitosis
<u>multipotent</u>	describes the condition of being able to differentiate into different types of cells within a given cell lineage or small number of lineages, such as a red blood cell or white blood cell
<u>mutation</u>	change in the nucleotide sequence in a gene within a cell's DNA
<u>nuclear envelope</u>	membrane that surrounds the nucleus; consisting of a double lipid-bilayer
<u>nuclear pore</u>	one of the small, protein-lined openings found scattered throughout the nuclear envelope
<u>nucleolus</u>	small region of the nucleus that functions in ribosome synthesis
<u>nucleosome</u>	unit of chromatin consisting of a DNA strand wrapped around histone proteins
<u>nucleus</u>	cell's central organelle; contains the cell's DNA
<u>oligopotent</u>	describes the condition of being more specialized than multipotency; the condition of being able to differentiate into one of a few possible cell types
<u>organelle</u>	any of several different types of membrane-enclosed specialized structures in the cell that perform

	specialized structures in the cell that perform specific functions for the cell
<u>osmosis</u>	diffusion of molecules down their concentration across a selectively permeable membrane
<u>passive transport</u>	form of transport across the cell membrane that does not require input of cellular energy
<u>peripheral protein</u>	membrane-associated protein that does not span the width of the lipid bilayer, but is attached peripherally to integral proteins, membrane lipids, or other components of the membrane
<u>peroxisome</u>	membrane-bound organelle that contains enzymes primarily responsible for detoxifying harmful substances
<u>phagocytosis</u>	endocytosis of large particles
<u>pinocytosis</u>	endocytosis of fluid
<u>pluripotent</u>	describes the condition of being able to differentiate into a large variety of cell types
<u>polypeptide</u>	chain of amino acids linked by peptide bonds
<u>polyribosome</u>	simultaneous translation of a single mRNA transcript by multiple ribosomes
<u>promoter</u>	region of DNA that signals transcription to begin at that site within the gene
<u>prophase</u>	first stage of mitosis (and meiosis), characterized by breakdown of the nuclear envelope and condensing of the chromatin to form chromosomes
<u>proteome</u>	full complement of proteins produced by a cell (determined by the cell's specific gene expression)
<u>RNA polymerase</u>	enzyme that unwinds DNA and then adds new nucleotides to a growing strand of RNA for the transcription phase of protein synthesis
<u>reactive oxygen species (ROS)</u>	a group of extremely reactive peroxides and oxygen-containing radicals that may contribute to cellular damage
<u>receptor-mediated endocytosis</u>	endocytosis of ligands attached to membrane-bound receptors

<u>receptor</u>	protein molecule that contains a binding site for another specific molecule (called a ligand)
<u>ribosomal RNA (rRNA)</u>	RNA that makes up the subunits of a ribosome
<u>ribosome</u>	cellular organelle that functions in protein synthesis
<u>S phase</u>	stage of the cell cycle during which DNA replication occurs
<u>selective permeability</u>	feature of any barrier that allows certain substances to cross but excludes others
<u>sister chromatid</u>	one of a pair of identical chromosomes, formed during DNA replication
<u>sodium-potassium pump</u>	(also, Na <sup>+</sup> /K <sup>+</sup> ATP-ase) membrane-embedded protein pump that uses ATP to move Na <sup>+</sup> out of a cell and K <sup>+</sup> into the cell
<u>somatic cell</u>	all cells of the body excluding gamete cells
<u>spliceosome</u>	complex of enzymes that serves to splice out the introns of a pre-mRNA transcript
<u>splicing</u>	the process of modifying a pre-mRNA transcript by removing certain, typically non-coding, regions
<u>stem cell</u>	cell that is oligo-, multi-, or pluripotent that has the ability to produce additional stem cells rather than becoming further specialized
<u>telophase</u>	final stage of mitosis (and meiosis), preceding cytokinesis, characterized by the formation of two new daughter nuclei
<u>totipotent</u>	embryonic cells that have the ability to differentiate into any type of cell and organ in the body
<u>transcription factor</u>	one of the proteins that regulate the transcription of genes
<u>transcription</u>	process of producing an mRNA molecule that is complementary to a particular gene of DNA
<u>transfer RNA (tRNA)</u>	molecules of RNA that serve to bring amino acids to a growing polypeptide strand and properly place them into the sequence
<u>translation</u>	process of producing a protein from the nucleotide sequence code of an mRNA transcript

<u>triplet</u>	consecutive sequence of three nucleotides on a DNA molecule that, when transcribed into an mRNA codon, corresponds to a particular amino acid
<u>unipotent</u>	describes the condition of being committed to a single specialized cell type
<u>vesicle</u>	membrane-bound structure that contains materials within or outside of the cell