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Molecular Biology

Glossary

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Actin	A protein found in the cytoskeleton and muscle cells; it is the principal constituent of the thin filament
Active site	Substrate-binding region of an enzyme.
Active transport	The use of energy to move a substance across a membrane against a concentration gradient.
Adenosine triphosphate	A nucleotide molecule consisting of adenine, ribose, and three phosphate moieties. The outer two phosphates are bound by high-energy bonds. ATP plays a central role in energy exchange in biological systems. (Adenosine diphosphate [ADP] contains two phosphate groups and one high-energy bond.)
Anaphase	The stage of mitosis or meiosis characterized by the migration of chromatids or homologous chromosomes to opposite poles of the dividing cell.
Antibiotic	Substance that kills or inhibits the growth of bacteria or fungi (usually by disrupting am wall assembly or by binding to ribosomes, thus inhibiting protein synthesis)
Bacillus	Rod-shaped bacterium.
Bacteriophage	A virus that invades bacteria and sometimes uses bacterial RNA and ribosomes to self-replicate. (See transduction.)
cAMP	(See cyclic adenosine monophosphate.)

Centriole	A small organelle in the cytoplasm of animal cells; it organizes the spindle apparatus during mitosis or meiosis.
Centromere	The area of a chromosome at which sister chromatids are joined; it is also the point of attachment to the spindle fiber during mitosis and meiosis.
Cocci	Spherically shaped bacteria.
Codon	A three-base sequence on an mRNA strand; it codes for a specific tRNA anticodon, and thus for a specific amino acid.
Coenocytic	Cells consisting of many nuclei housed within the same cytoplasm (i.e., skeletal muscle tissue)
Coenzyme	An organic cofactor required for enzyme activity.
Cofactor	Nonprotein molecules required by many enzymes for activity.
Cyclic adenosine monophosphate (CAMP)	An intracellular participant in one of the mechanisms of hormonal action. Synthesized from ATP by adenylate cyclase. It is also referred to as a "second messenger."
Cytokinesis	The division and distribution of parent cell cytoplasm to the two daughter cells during mitotic and meiotic cell division
Cytoplasm	The fluid and solutes within a cell membrane, external to the nucleus and cellular organelles
Cytosine	A pyrimidine base found in nucleic acids; it hydrogen bonds with guanine
Deoxyribose	The five-carbon cyclic (pentose) sugar found in DNA
DNA (Deoxyribonucleic acid)	Nucleic acid composed of monomers consisting of the 5-carbon sugar deoxyribose, a phosphate group, and a nitrogenous base (adenine, cytosine, guanine, or thymine); contains the cell's genetic information
Endoplasmic reticulum	Membrane-bound channels in the cytoplasm that transport proteins and lipids to various parts of the cell.

Enzyme	A protein that catalyzes a biochemical reaction
Epinephrine	(See adrenalin.)
Eukaryote	A unicellular or multicellular organism composed of cells that contain a membrane-bound nucleus and other membrane-bound organelles
Extensor	A muscle used in the straightening of a limb
Facultative anaerobes	Prokaryotes that can exist with or without oxygen
Fixation	The process of preparing tissues for microscopic examination
Flagellum	A microscopic, whip-like filament that functions in locomotion of sperm cells and some unicellular organisms, and is composed of microtubules
Flexor	A muscle used in the bending of a limb
Golgi bodies	Organelles that play a role in the packaging and secretion of proteins and other molecules produced intracellularly
Histone	Structural protein found in eukaryotic chromosomes
Hyphae	Branched filaments of a fungus
In situ	At the site of (origin)
In vitro	In a test tube or in culture
In vivo	In a living organism
Induction	The initiation of cell differentiation in a developing embryo due to the influence of other cells.
Interphase	The stage between successive nuclear divisions; it is divided into the G1, S, and G2 stages. Cell growth and DNA replication occur

	during interphase.
Lysogenic cycle (lysogeny)	Bacteriophage infection involving the integration of viral DNA into the bacterial genome without disrupting or destroying the host. The virus may subsequently reemerge and enter a lytic cycle.
Lysosome	A membrane-bound organelle that stores hydrolytic enzymes
Lytic cycle	Bacteriophage infection involving the destruction (lysis) of the host bacterium
Meiosis	A process of cell division in which two successive nuclear divisions produce four haploid gametes from one diploid germ cell.
Messenger RNA (mRNA)	This class of RNA is the product of the transcription process and acts as a template for the synthesis of polypeptides (translation).
Metaphase	The stage of mitosis or meiosis during which single chromosomes or tetrads line up on the central axis of the dividing cell and become attached to spindle fibers.
Microtubule	A small hollow tube composed of two types of protein subunits, serving numerous functions in the cell (e.g., microtubules comprise the internal structures of cilia and flagella)
Mitochondria	Membrane-bound cellular organelles in which the reactions of aerobic respiration and ATP synthesis occur
Mitosis	Cellular division that results in the formation of two daughter cells that are genetically identical to each other and to the parent cell.
Mycelium	A collection of filamentous hyphae which makes up a fungus.
Myosin	A protein found in muscle cells that functions in muscle contraction. Myosin fibers are also called thick filaments
Nuclear membrane	Double membrane enveloping the nucleus, interrupted periodically by pores; found in eukaryotic cells only
Nucleoid	The region in prokaryotic cells where the chromosome is located

Nucleolus	Dense body visible in a nondividing nucleus. Site of ribosomal RNA synthesis
Nucleosome	Packaging unit of DNA in eukaryotic cells, consisting of DNA and histone proteins complexed together
Nucleotide	An organic molecule composed of three subunits: a 5-carbon sugar, a phosphate group, and a purine or a pyrimidine (nitrogenous base). The basic subunits of DNA and RNA
Nucleus	The eukaryotic membrane-bound organelle that contains the cell's chromosomes
Operator	A site on DNA that interacts with a repressor protein, regulating transcription of an operon
Operon	A segment of DNA consisting of a promoter, operator, and structural genes. The structural genes code for products of a specific biochemical pathway; their transcription is regulated by a repressor protein
Passive transport	The movement of a substance across a membrane without the expenditure of energy
Peptide bond	The bond between two amino acids that results from a condensation reaction between the carboxyl end of one amino acid and the amino end of the other.
Permeable	Allowing solutes to pass through; a term usually applied to biological membranes
Phagocytosis	A type of endocytosis in which large particles are engulfed by a cell
Pinocytosis	A type of endocytosis in which small particles or liquid are engulfed by a cell
Polyribosome	A group of ribosomes attached to a strand of mRNA, simultaneously translating it
Prokaryote	Cell lacking a nuclear membrane and membrane-bound organelles, such as a bacterium

Promoter	A specific site on the DNA strand to which RNA polymerase attaches to initiate operon transcription
Prophase	The stage of mitosis or meiosis during which the DNA strands condense to form visible chromosomes; during prophase I of meiosis, homologous chromosomes align
Prosthetic group	A nonpolypeptide unit tightly bound to an enzyme that is essential for that enzyme's activity
Repressor	In an operon, the protein that prevents attachment of RNA polymerase to the promoter by binding to the operator. It is coded for by the regulator
Retrovirus	An RNA virus which contains the enzyme reverse transcriptase, which transcribes RNA into DNA
Ribosome	Organelle composed of RNA and protein; it translates mRNA during polypeptide synthesis
RNA (Ribonucleic acid)	Nucleic acid composed of monomers consisting of the 5-carbon sugar ribose, a phosphate group, and a nitrogenous base (adenine, guanine, cytosine, or uracil); functions in protein synthesis
Sarcolemma	Muscle cell membrane capable of propagating action potentials
Sarcomere	The functional contractile unit of striated muscle
Sarcoplasmic reticulum	The endoplasmic reticulum of a muscle cell; it envelops myofibrils
Somatic cells	Autosomal cells; all cells in the body except germ cells and gametes
Spindle	A structure within dividing cells composed of microtubules; it is involved in the separation of chromosomes during mitosis and meiosis
Stem cells	Undifferentiated, rapidly dividing cells in the marrow of long bones that differentiate into red and white blood cells
Synapsis	The pairing of homologous chromosomes during prophase I of

	meiosis
Telophase	The final stage of mitosis or meiosis during which the chromosomes uncoil, nuclear membranes reform, and cytokinesis occurs
Template	A molecule that directs the synthesis of another molecule by acting as a model or pattern (e.g., mRNA is the template for protein synthesis)
Tetanus	Sustained muscle contraction that results from continuous stimulation
Tonus	A continuous state of muscle contraction
Transcription	The synthesis of RNA molecules from a DNA template
Transduction	The transposition of genetic material from one organism to another by a virus
Transfer RNA (tRNA)	RNA molecules that bind to specific amino acids and carry them to ribosome/mRNA complexes during protein synthesis
Transformation	Uptake and incorporation of "naked" DNA by a recipient bacterial cell
Translation	The process by which protein synthesis is directed by an mRNA nucleotide sequence
Uracil	A pyrimidine found in RNA but not DNA; it forms hydrogen bonds with adenine
Virus	A tiny, organism-like particle composed of protein-encased nucleic acid; viruses are obligate parasites