

## Biology Key Terms

**amoeboid** -- Having no definite shape to the cell, able to change shape.

**amphiesma** -- The outer covering of a dinoflagellate, consisting of several membrane layers.

**aperture** -- Small opening, for example the opening in the test of a foram.

**bacteriophage** -- Virus which infects and destroys a bacterial host. Some phages, however, will incorporate their DNA into that of their host, and remain dormant for an extended period. For this reason, they have become essential tools of genetic engineers.

**capsid** -- The protein "shell" of a free virus particle.

**cell** -- Fundamental structural unit of all life. The cell consists primarily of an outer plasma membrane, which separates it from the environment; the genetic material (DNA), which encodes heritable information for the maintenance of life; and the cytoplasm, a heterogeneous assemblage of ions, molecules, and fluid.

**cell cycle** -- Complete sequence of steps which must be performed by a cell in order to replicate itself, as seen from mitotic event to mitotic event. Most of the cycle consists of a growth period in which the cell takes on mass and replicates its DNA. Arrest of the cell cycle is an important feature in the reproduction of many organisms, including humans.

**cell membrane** -- The outer membrane of a cell, which separates it from the environment. Also called a plasma membrane or plasmalemma.

**cell wall** -- Rigid structure deposited outside the cell membrane. Plants are known for their cell walls of cellulose, as are the green algae and certain protists, while fungi have cell walls of chitin.

**chloroplast** -- A chlorophyll-containing plastid found in algal and green plant cells.

**chromosome** -- Linear piece of eukaryotic DNA, often bound by specialized proteins known as histones.

**coenocytic** -- Condition in which an organism consists of filamentous cells with large central vacuoles, and whose nuclei are not partitioned into separate compartments. The result is a long tube containing many nuclei, with all the cytoplasm at the periphery.

**colonial** -- Condition in which many unicellular organisms live together in a somewhat coordinated group. Unlike true multicellular organisms, the individual cells retain their separate identities, and usually, their own membranes and cell walls.

**contractile vacuole** -- In many protists, a specialized vacuole with associated channels designed to collect excess water in the cell. Microtubules periodically contract to force this excess water out of the cell, regulating the cell's osmotic balance.

**cytoplasm** -- All the contents of a cell, including the plasma membrane, but not including the nucleus.

**cytoskeleton** -- Integrated system of molecules within eukaryotic cells which provides them with shape, internal spatial organization, motility, and may assist in communication with other cells and the environment. Red blood cells, for instance, would be spherical instead of flat if it were not for their cytoskeleton.

**dikaryotic** -- Having two different and distinct nuclei per cell; found in the fungi. A dikaryotic individual is called a dikaryon.

**diploid** -- Having two different sets of chromosomes in the same nucleus of each cell. Most metazoans and plants are diploid. Compare with haploid.

**double membrane** -- In mitochondria and plastids, there is a two-layered membrane which surrounds the organelle. This is believed to be the result of endosymbiosis, with the outer membrane coming from the eukaryotic cell, and the inner membrane belonging to the original prokaryote which was "swallowed".

**endoplasmic reticulum** -- (ER) network of membranes in eukaryotic cells which helps in control of protein synthesis and cellular organization.

**eukaryote** -- n. An organism whose cells have cytoskeletons for support and their DNA contained in a nucleus, separated from the other contents of the cell; e.g., protists, plants, animals, and fungi.

**extracellular matrix** -- (ECM) Region outside of metazoan cells which includes compounds attached to the plasma membrane, as well as dissolved substances attracted to the surface charge of the cells. The ECM functions both to keep animal cells adhered together, and well as buffering them from their environment.

**eyespot** -- Light-sensitive organelle found in many groups of protists, and in some metazoans.

**filament** -- Long chain of proteins, such as found in hair, muscle, or in flagella.

**fission** -- Division of single-celled organisms, especially prokaryotes, in which mitosis does not occur. Also used to refer to mitosis in certain unicellular fungi.

**flagellum** -- Hair-like structure attached to a cell, used for locomotion in many protists and prokaryotes. The prokaryotic flagellum differs from the eukaryotic flagellum in that the prokaryotic flagellum is a solid unit composed primarily of the protein flagellin, while the eukaryotic flagellum is composed of several protein strands bound by a membrane, and does not contain flagellin. The eukaryotic flagellum is sometimes referred to as an undulipodium.

**frustule** -- The mineral "skeleton" of a diatom or other unicellular organism.

**Golgi apparatus** -- Eukaryotic organelle which package cell products, such as enzymes and hormones, and coordinate their transport to the outside of the cell.

**haploid** -- Having a single set of chromosomes in the nucleus of each cell. Mosses, and many protists and fungi, are haploid, as are some insects, bryophytes, and the gametes of all organisms. Contrast with diploid.

**haptonema** -- Peg-like structure unique to the Prymnesiophyta; its function is not known.

**lorica** -- A vase-shaped or cup-shaped outer covering. Found in many protists, including some flagellates, ciliates, chrysophytes, and choanoflagellates, as well as in some animal cells.

**lysosome** -- Eukaryotic organelle which carries digestive enzymes. The lysosome fuses with a vacuolar membrane containing ingested particles, which are then acted upon by the enzymes.

**mastigoneme** -- Small hair-like filaments found on the "hairy" flagellum of the Chromista.

**membrane** -- Semi-fluid structure which bounds all cells, and partitions the interior of eukaryotic cells. It consists primarily of two lipid layers, with proteins "dissolved" in the lipids.

**mesokaryotic** -- Nuclear condition unique to the dinoflagellates in which the chromosomes remain permanently condensed.

**microtubules** -- Type of filament in eukaryotic cells composed of units of the protein tubulin. Among other functions, it is the primary structural component of the eukaryotic flagellum.

**microvilli** -- Thin fingerlike protrusions from the surface of a cell, often used to increase absorptive capacity or to trap food particles. The "collar" of choanoflagellates is actually composed of closely spaced microvilli.

**mitochondrion** -- Complex organelle found in most eukaryotes; believed to be descended from free-living bacteria that established a symbiotic relationship with a primitive eukaryote. Mitochondria are the site of most of the energy production in most eukaryotes; they require oxygen to function.  
**membrane.**

**mitosis** -- The process of nuclear division in eukaryotes. It is one step in cytokinesis, or cellular division.

**MTOC** -- (microtubule organizing center) MTOCs are bundles of protein tubes which may be found at the base of a eukaryotic flagellum. In animals, they also function in creating the arrays of microtubules that pull the chromosomes apart during mitosis.

**multicellular** -- Any organism which is composed of many cells is termed multicellular.

**nanometer** -- n. A unit of measure; one millionth ( $10^{-9}$ ) of a meter.

**nuclear membrane** -- The double membrane which surrounds the eukaryotic nucleus. It has many pores in its surface which regulate the flow of large compounds into and out of the nucleus.

**nucleoid** -- Region in prokaryotes where the DNA is concentrated. Unlike a nucleus, it is not bound by a membrane.

**nucleus** -- Membrane-bound organelle which contains the DNA in the form of chromosomes. It is the site of DNA replication, and the site of RNA synthesis.

**organelle** -- n. A membrane-bound structure in a eukaryotic cell that partitions the cell into regions which carry out different cellular functions, e.g., mitochondria, endoplasmic reticulum, lysosomes.

**plasma membrane** -- Outer membrane of a cell, sometimes called the cell membrane. The term plasma membrane is used more frequently when discussing prokaryotes.

**plasmid** -- Circular loop of DNA in prokaryotes. Eukaryotic DNA is organized into chromosomes.

**plastid** -- Any of several pigmented cytoplasmic organelles found in plant cells and other organisms, having various physiological functions, such as the synthesis and storage of food.

**prokaryotic** -- Literally "before the nucleus", the term applies to all bacteria and archaea. Prokaryotic cells have no internal membranes or cytoskeleton. Their DNA is circular, not linear.

**protoplasm** -- All the contents of a cell, including the nucleus. (see: cytoplasm)

**pseudopodia** -- Fingerlike extensions from an amoeboid cell; literally "false feet".

**repeat sequences** -- The length of a nucleotide sequence that is repeated in a tandem cluster.

**reticulopodia** -- Long thread-like pseudopodia that branch apart and rejoin, forming a fine network. They are characteristic of forams.

**ribosome** -- (ribosomal RNA)

**syncytic** -- see Hexactinellida

**test** -- n. A hard shell produced by some unicellular protists; may be made of calcium carbonate, silica, or sand grains.

**theca** -- General term for any stiff outer covering of a unicellular protist, and usually made up of interlocking plates. dinoflagellates and diatoms are examples of protists with thecae.

**transduction** -- Viral transfer of DNA to new host.

**trichocyst** -- Organelle in ciliates and dinoflagellates which releases long filamentous proteins when the cell is disturbed. Used as a defense against would-be predators.

**ultrastructure** -- The detailed structure of a specimen, such as a **cell**, **tissue**, or **organ**, that can be observed only by electron microscopy. Also called fine structure.

**undulipodium** -- Another term for a eukaryotic flagellum.

**vacuole** -- Membrane-bound fluid-filled space within a cell. In most plant cells, there is a single large vacuole filling most of the cell's volume. Some bacterial cells contain gas vacuoles.