

Section Cell Organelles 3 2 Power Notes

Mitochondrion

mammalian red blood cells). The multicellular animal Henneguya salminicola is known to have retained mitochondrion-related organelles despite a complete

A mitochondrion (pl. mitochondria) is an organelle found in the cells of most eukaryotes, such as animals, plants and fungi. Mitochondria have a double membrane structure and use aerobic respiration to generate adenosine triphosphate (ATP), which is used throughout the cell as a source of chemical energy. They were discovered by Albert von Kölliker in 1857 in the voluntary muscles of insects. The term mitochondrion, meaning a thread-like granule, was coined by Carl Benda in 1898. The mitochondrion is popularly nicknamed the "powerhouse of the cell", a phrase popularized by Philip Siekevitz in a 1957 Scientific American article of the same name.

Some cells in some multicellular organisms lack mitochondria (for example, mature mammalian red blood cells). The multicellular animal Henneguya salminicola...

Myosin

in the transport of cargo (e.g. RNA, vesicles, organelles, mitochondria) from the center of the cell to the periphery, but has been furthermore shown

Myosins () are a family of motor proteins (though most often protein complexes) best known for their roles in muscle contraction and in a wide range of other motility processes in eukaryotes. They are ATP-dependent and responsible for actin-based motility.

The first myosin (M2) to be discovered was in 1864 by Wilhelm Kühne. Kühne had extracted a viscous protein from skeletal muscle that he held responsible for keeping the tension state in muscle. He called this protein myosin. The term has been extended to include a group of similar ATPases found in the cells of both striated muscle tissue and smooth muscle tissue.

Following the discovery in 1973 of enzymes with myosin-like function in Acanthamoeba castellanii, a global range of divergent myosin genes have been discovered throughout the realm...

Telocyte

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Telocytes are a type of interstitial (stromal) cells with very long (tens to hundreds of micrometres) and very thin prolongations (mostly below the resolving power of light microscopy) called

telopodes.

Staining

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Staining is a technique used to enhance contrast in samples, generally at the microscopic level. Stains and dyes are frequently used in histology (microscopic study of biological tissues), in cytology (microscopic study of cells), and in the medical fields of histopathology, hematology, and cytopathology that focus on the study and diagnoses of diseases at the microscopic level. Stains may be used to define biological tissues (highlighting, for example, muscle fibers or connective tissue), cell populations (classifying different blood cells), or organelles within individual cells.

In biochemistry, it involves adding a class-specific (DNA, proteins, lipids, carbohydrates) dye to a substrate to qualify or quantify the presence of a specific compound. Staining and fluorescent tagging can serve...

Flagellum

three-dimensional motion with a power and recovery stroke. Yet another traditional form of distinction is by the number of 9+2 organelles on the cell. Intraflagellar

A flagellum (; pl.: flagella) (Latin for 'whip' or 'scourge') is a hair-like appendage that protrudes from certain plant and animal sperm cells, from fungal spores (zoospores), and from a wide range of microorganisms to provide motility. Many protists with flagella are known as flagellates.

A microorganism may have from one to many flagella. A gram-negative bacterium *Helicobacter pylori*, for example, uses its flagella to propel itself through the stomach to reach the mucous lining where it may colonise the epithelium and potentially cause gastritis, and ulcers – a risk factor for stomach cancer. In some swarming bacteria, the flagellum can also function as a sensory organelle, being sensitive to wetness outside the cell.

Across the three domains of Bacteria, Archaea, and Eukaryota, the flagellum...

Osmosis

moves out of the cell and the cell shrinks. In doing so, the cell becomes flaccid. In extreme cases, the cell becomes plasmolyzed – the cell membrane disengages

Osmosis (, US also) is the spontaneous net movement or diffusion of solvent molecules through a selectively-permeable membrane from a region of high water potential (region of lower solute concentration) to a region of low water potential (region of higher solute concentration), in the direction that tends to equalize the solute concentrations on the two sides. It may also be used to describe a physical process in which any solvent moves across a selectively permeable membrane

(permeable to the solvent, but not the solute) separating two solutions of different concentrations. Osmosis can be made to do work. Osmotic pressure is defined as the external pressure required to prevent net movement of solvent across the membrane. Osmotic pressure is a colligative property, meaning that the osmotic...

Lens (vertebrate anatomy)

the epithelial cells into crystallin filled fiber cells without organelles occurs within the confines of the lens capsule. Older cells cannot be shed

The lens, or crystalline lens, is a transparent biconvex structure in most land vertebrate eyes. Relatively long, thin fiber cells make up the majority of the lens. These cells vary in architecture and are arranged in concentric layers. New layers of cells are recruited from a thin epithelium at the front of the lens, just below the basement membrane surrounding the lens. As a result the vertebrate lens grows throughout life. The surrounding lens membrane referred to as the lens capsule also grows in a systematic way, ensuring the lens maintains an optically suitable shape in concert with the underlying fiber cells. Thousands of suspensory ligaments are embedded into the capsule at its largest diameter which suspend the lens within the eye. Most of these lens structures are derived from the...

Active transport

biology, active transport is the movement of molecules or ions across a cell membrane from a region of lower concentration to a region of higher concentration—against

In cellular biology, active transport is the movement of molecules or ions across a cell membrane from a region of lower concentration to a region of higher concentration—against the concentration gradient. Active transport requires cellular energy to achieve this movement. There are two types of active transport: primary active transport that uses adenosine triphosphate (ATP), and secondary active transport that uses an electrochemical gradient. This process is in contrast to passive transport, which allows molecules or ions to move down their concentration gradient, from an area of high concentration to an area of low concentration, with energy.

Active transport is essential for various physiological processes, such as nutrient uptake, hormone secretion, and nerve impulse transmission. For...

Chromatophore

(2003). "Dynactin is required for bidirectional organelle transport". The Journal of Cell Biology. 160 (3): 297-301. doi:10.1083/jcb.200210066. PMC 2172679

Chromatophores are cells that produce color, of which many types are pigment-containing cells, or groups of cells, found in a wide range of animals including amphibians, fish, reptiles, crustaceans and cephalopods. Mammals and birds, in contrast, have a class of cells called melanocytes for coloration.

Chromatophores are largely responsible for generating skin and eye colour in ectothermic animals and are generated in the neural crest during embryonic development. Mature chromatophores are grouped into subclasses based on their colour under white light: xanthophores (yellow), erythrophores (red), iridophores (reflective / iridescent), leucophores (white), melanophores (black/brown), and cyanophores (blue). While most chromatophores contain pigments that absorb specific wavelengths of light...

Blood

cells lack a nucleus and organelles in mammals. The red blood cells (together with endothelial vessel cells and other cells) are also marked by glycoproteins

Blood is a body fluid in the circulatory system of humans and other vertebrates that delivers necessary substances such as nutrients and oxygen to the cells, and transports metabolic waste products away from those same cells.

Blood is composed of blood cells suspended in blood plasma. Plasma, which constitutes 55% of blood fluid, is mostly water (92% by volume), and contains proteins, glucose, mineral ions, and hormones. The blood cells are mainly red blood cells (erythrocytes), white blood cells (leukocytes), and (in mammals) platelets (thrombocytes). The most abundant cells are red blood cells. These contain hemoglobin, which facilitates oxygen transport by reversibly binding to it, increasing its solubility. Jawed vertebrates have an adaptive immune system, based largely on white blood cells...

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