

Structure of a Generalised Cell

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See what a cell looks like on the inside

Cell Part:Structure:Functions:Plasma membraneMembrane composed of a double layer of lipids (phospholipids, cholesterol) within which proteins are embedded; proteins may extend entirely through the lipid bilayer or protrude on only one face; externally facing proteins and some lipids have attached sugar groupsServes as an external cell barrier; acts in transport of substances into or out of the cell; externally facing proteins act as receptors (for hormones, neurotransmitters) and in cell-to-cell recognitionCytoplasmCellular region between the nuclear and plasma membranes; consists of fluid cytosol, containing dissolved solutes, inclusions (stored nutrients, pigments granules), and organelles, the metabolic machinery of the cytoplasm.Cytoplasmic organelles −MitochondriaRod-like, double-membrane structures; inner membrane folded into projections called cristaeSite of ATP synthesis; powerhouse of the cell −Ribosome'sDense particles consisting of two subunits, each composed of ribosomal RNA and proteins; free or attached to rough ERThe sites of protein synthesis −Rough endoplasmic reticulumMembrane system enclosing a cavity, the cistern a, and coiling through the cytoplasm; externally studded with ribosome'sMakes proteins that are secreted from the cell; makes the cell's membrane −Smooth endoplasmic reticulumMembranous system of tubules; free of ribosomesSite of lipid metabolism −Golgi apparatusA stack of smooth membrane sacs close to the nucleusPackages, modifies, and segregates proteins for secretion from the cell and inclusion in lysosomes; sends membranes from rough ER to their destinations −LysosomesMembranous sacs containing acid hydrolasesSites of intracellular digestion −PeroxisomesMembranous sacs of oxidase enzymesThe enzymes detoxify a number of toxic substances; the most important enzyme, catalase, breaks down hydrogen peroxide −MicrofilamentsFine filaments of the contractile protein actinInvolved in muscle contraction and other types of intracellular movement; help form the cell's cytoskeleton −Intermediate filamentsProtein fibres; composition variesThe stable cytoskeleton elements; resist tensile forces acting on the cell −MicrotubulesCylindrical structures composed of tubulin proteinsSupport the cell and give it shape; involved in intracellular and cellular movements, form centrioles −CentriolesPaired cylindrical bodies, each composed of nine triplets of microtubulesOrganise a microtubule network during mitosis to form the spindle; form bases of cilia and flagellaNucleusSurrounded by the nuclear membrane; contains fluid nucleoplasm, nucleoli, and chromatinControl center of the cell; responsible for transmitting genetic information and providing the instructions for protein synthesis −Nuclear membraneDouble bilipid membrane containing proteins; pierced by pores; continuous with the cytoplasmic ERSeparates the nucleoplasm from the cytoplasm and regulates passage of substances to and from the nucleus −NucleoliDense spherical (non-membrane-bounded) bodiesSite of ribosome subunit manufacture −ChromatinGranular, threadlike material composed of DNA and histone proteins Source: Marieb, EN and Mallat, J. Human Anatomy. 2nd ed. Menlo Park, Calif.: Benjamin Cummings, c1997.