

Organelles Ribosomes = synthesize proteins; made of rRNA Rough ER = compartmentalize cell and modify proteins synthesized by ribosomes Smooth ER = detoxification of drugs, store calcium ions, and lipid production Golgi Complex = package and fold proteins coming from ER; synthesize lysosomes Mitochondria = ATP production for cellular respiration; contain double membrane; inner foldings are called cristae Lysosomes = break down waste; digest food by using phagocytosis or engulfing nutrients to digest them with enzymes Vacuole = water storage Chloroplast = photosynthesis Centrioles = small, paired cylindrical structures during cellular division, only in animal cells	Cell Size the greater the SA/V ratio, the more efficient the cell is	Cell Membrane small non polar molecules (N₂, O₂, CO₂) can pass membrane easily, but larger polar molecules and ions cannot pass hydrophobic region alone aquaporins = channel protein for water channel proteins = a channel for smaller molecules like ions carrier proteins = for larger molecules like glucose; once it enters inside, it spins to the other side of membrane glycoproteins and glycolipids help with cell signaling and the attachment of the cell to other structures hydrophobic fatty acid tails repel charged and polar molecules	endosymbiotic theory (cont) early ancestor of eukaryotic cell engulfed a prokaryotic cell, and the prokaryotic cell became an endosymbiont (a cell living in another cell) which was the mitochondria and chloroplast
Facilitated Diffusion passive transport that does not require energy concentration gradient = particles move from highly concentrated area of particles to less concentrated area channel proteins = hydrophilic passage for molecules to avoid hydrophobic core; ex: aquaporins carrier proteins = slower than channel proteins; alter shape to transport hydrophilic molecules	Tonicity hypertonic solution = more solute than inside of cell; water rush OUT OF CELL (hyper run outside); plasmolyze hypotonic solution = less solute than inside of cell; water rushes INTO CELL (optimal for plants); turgid osmoregulation = cells can regulate their solute concentrations, maintain water balance, allows organisms to control their internal environment water potential = tendency for water to move in one direction to another (water will flow from areas of high water potential to low) (high pressure to low) (low solute to areas of high solute) osmosis = high water potential to low water potential isotonic = same; flaccid	cell compartmentalization eukaryotes compartmentalize their internal processes in membrane-bound organelles; much more efficient eukaryotic cells = RNA is made from DNA, RNA moves out of nucleus to ribosome or ER prokaryotic cells = RNA is made from DNA, RNA is immediately converted into a protein because there is no nucleus or ER	Transport simple diffusion = passive; small non-polar molecules with concentration gradient facilitated diffusion = passive; small polar molecules and ions with concentration gradient; transport protein needed osmosis = facilitate diffusion of water active transport = energy needed; bulky molecules traveling against concentration gradient endocytosis = taking bulk material INTO cell three types of endocytosis: 1. phagocytosis = cell engulfs large molecule, brings into cell, becomes food vacuole (phagosome) 2. pinocytosis = cell engulfs small solutes, bring into cell, becomes vesicles 3. receptor-mediated endocytosis = receptor binds to cell. when solutes bind to receptor, forms vesicle that will bind to lysosome until solutes are digested
	prokaryotes vs eukaryotes prokaryotes (bacteria): cytoplasm, nucleoid (circular DNA), cell wall, cell membrane, ribosomes, flagella (movement), capsule outside of membrane eukaryotes (fungi, protists, plants) : nucleus, nucleolus, only plasma membrane, membrane-bound organelles	endosymbiotic theory how eukaryotic cells evolved from prokaryotic cells?	



Transport (cont)

exocytosis = taking bulk material
OUT OF cell; transport vesicle
from golgi apparatus will fuse
with membrane and release its
contents outside of cell

plant cell vs animal cell

plants: cell wall, central vacuole,
plasmodesmata, chloroplast

animals : lysosomes, centro-
somes, flagella



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