Organelles

Nucleolus	where rRNA & ribosomes are synthesized
Ribosomes	protein factories
Peroxisomes	use converts H_2O_2 to water+O_2
Endome-mbrane System	regulates protein traffic+m-etabolic functions
Nucleus	holds chromatin, surrounded by nuclear envelope
Endoplasmic Reticulum	Rough: makes proteins Smooth: synthesizes lipids, stores Ca++, detoxifies drugs/poisons
Golgi Apparatus	processes, packages, & secretes substances
Lysosomes	intracellular digestion
Mitochondria	powerhouse of the cell :) (respiration)
Vacuoles	storage & pumping out water
Chloroplast	absorbs light & synthesize sugar
Cytosk-eleton	maintains cell shape, flow, positioning
Centrioles Centro-somes MTOCs	organize spindle fibers (cell division)
Cell Wall	protects, maintains shape, regulates water intake

Prokaryotic vs. Eukaryotic Cells

Prokaryotes	Eukaryotes

Prokaryotic vs. Eukaryotic Cells (cont)

-no internal membranes/organelles	-membrane-bound organelles
-circular DNA	-DNA forms chromosomes
-small ribosomes	-larger ribosomes
-anaerobic or aerobic metabolism	-aerobic metabolism
-no cytoskeleton	-cytoskeleton present
-mainly unicellular	-mainly multicellular
-very small	-larger cells

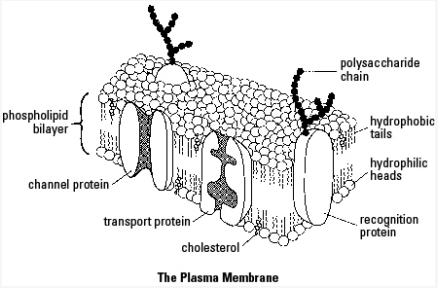
Water Potential (Ψ= Ψp+ Ψs)

water potential	potential energy of water to move elsewhere
solute potential	tendency of water to move across a permeable membrane into solution (Ψs=-iCRT)

Types of Cell Communication

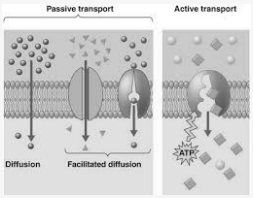
Quorum Sensing	monitors bacteria population density & controls gene expression
Autocrine Signals	produced & used by same cell
Juxtacrine Signals	physically touching cells (gap junctions, plasmodesmata)
Paracrine Signals	adjacent (not touching) cells (synapses, growth factors)
Endocrine Signals	for all tissues, long distance (hormones)

Plasma Membrane Structure

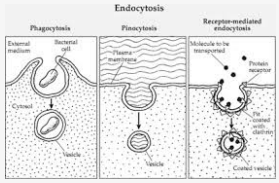


The Plasma Membrane

Plasma Membrane Transport



Endocytosis & Exocytosis



Signal Transduction Pathways- Reception

Reception	ligand binds to cell membrane or intracellular receptors & activates 2nd messenger
Ion channel	allows influx of ions to carry a message
GPCR	ligand binds, changes cytopl-asmic structure, activates G protein, bonds to GTP, catalyzes cAMP production
Protein kinase (RTKs)	ligand binds, aggregates+acti-vates tyrosine kinase regions, activates relay proteins
Intrac-ellular	hydrophobic messengers diffuse into the cell and control genes

Signal Transduction & Response

Signal transd-uction pathway	multistep process in which extracellular signal molecules produce a cascade effect
Second messenger	intermediate molecule (like cAMP) that distributes+amp-lifies signal throughout the cell
Response	regulation of protein synthesis by turning genes on/off

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Apoptosis

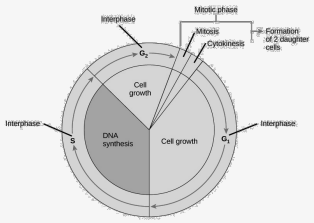
may be engulfed when no longer needed

cells with genetic damage are replaced

defense against infection

signals trigger caspases to carry out apoptosis

The Cell Cycle



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