

Structure & Function of Macromolecules?

dehydration reaction: water molecule **formed** when 2 molecules are **covalently** bonded connecting monomers to form a polymer

enzymes: speed up chemical RXNs can be made of

hydrolysis: bond between monomers broken by adding a water molecule polymers disassembled to monomers by this

glycosidic linkage: **covalent** bond formed between monosaccharides in a dehydration reaction

saturated fatty acids: as many H bonds possible

unsaturated fatty acids: one or more double bonds w/ 1 fewer H fewer carbon

polypeptide: polymer of Amino Acids

Proteins!

primary structure: linear amino acid chain initial folding of linear polypeptide is driven by hydrogen bond formation of polypeptide backbone

Proteins! (cont)

secondary structure: forms alpha helices and beta pleated sheets through hydrogen bonding between polypeptide backbone to form alpha-helices and beta-sheets - secondary structure

tertiary structure: hydrophobic interaction drives this structure 3D shape interactions between side chains

quaternary structure: 2 or more aggregated polypeptide chains ex: hemoglobin, collagen

Protein folding: not very efficient = about 30% of all newly synthesized polypeptides are misfolded and tagged

ubiquitin liagase: ubiquitin tags misfolded proteins for the proteasome to breakdown

Nucleic Acids

pyrimidine: C and T and Uracil smaller than purines

purines: A and G larger than pyrimidines

General Cell Stuff

Plant cells: mitochondria, nucleus(nucleolous, nuclear envelope, chromatin), peroxisomes, cell wall, chloroplasts, ribosomes, ERs, Golgi, central vacuole

Animal Cells

Endomembrane system

Included is ...: nuclear envelope, ER, Golgi, lysosomes, vessicles and vacuoles

Tasks: protein synthesis, transport proteins into membranes, organelles, or out of cell, metabolism, movement of lipids

Rough ER: ribosomes attached

Enzymes

Enzymes: Enzymes often change shape when they bind their substrate(s). NOT always protien

allosteric site: CAN be the same as an active site ATP can be a substrate at active site or bind allosterically as inhibitor



Fibers of the cytoskeleton

microtubules	thickest	contain tubulin dimers	maintain cell shape cell motility (cilia/flagella) chromosome mvmt organelle mvmt
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microfilaments	thinnest solid rods aka actin filaments	made of actin	maintain adhesion change cell shape contractions cell motility animal cell division
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intermediate filaments	mid-range	made of protein	anchor nucleus
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microtubules	guide vesicles from ER to Golgi and from Golgi to plasma membrane	separation of chromosomes
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centrosome	microT grow from centrosome near nucleus	centrioles - within centrosome
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Fibers of the cytoskeleton (cont)

cilia and flagella	motile cilia typically <i>do not</i> have signal receiving antennae (nonmotile)	bending of flagella and cilia = dyneins 9 motor proteins attached to microT
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motor proteins	two ATPase heads that bind swivel unbind (repeat) for a walking motion to move proteins	ATP for energy	dyneins (-) kinesins (+)
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Membranes

lipid bilayer

C

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