DynaNotes™ Review Guide

BIO Biology End-of-Course

DYNA NOTES

Category 1 – Cell Structure and Function

CELLS

cell: smallest unit of living things
- simple cells are prokaryotic
- complex cells containing organelles with specific functions are eukaryotic

Characteristic	Prokaryotic	Eukaryotic
cell membrane	yes	yes
cytoplasm	yes	yes
ribosomes	smaller	larger
nucleus	no	yes
organelles	no	yes

Example: eukaryotic cell (animal cell with organelles)

Cell Part or Organelle	Description
cell membrane	surrounds cell; controls what enters/leaves cell; recognizes other cells; maintains homeostasis
cytoplasm	suspends organelles in a eukaryotic cell; enclosed within the cell membrane
nucleus	controls the cell's activities; contains chromosomes made of DNA
mitochondria	breaks down food to release energy
endoplasmic reticulum *smooth or rough*	can move and change proteins (rough produce lipids (smooth ER); pipe-like
ribosome	makes proteins; round structures l rough endoplasmic reticulum
golgi body/complex	changes and packages cell prod
lysosome	breaks down materials in the cell us and enzymes that speed u estion
vacuole	holds materials like wat a plant c

The following organelles are found only in pla

cell wall: surrounds cell membrane; support ell

chloroplast: contains chlorophyll (green pigme

CELLULAR PROCESSES

homeostasis: regulation of conditi pH or ten) wit a cell which allows for stable, "n ance)

energy conversion: during ph from the sun to make a sugar called respiration, mitochondria release molecules se

molecule transportation: molecules mo of cells across the cell membrane by various means; activ transport proteins) requires assive transport does not

synthesis of n create new ules f simpler molecu from amino

VIRUSES

virus: tiny non-living
- no metabolism (dep
- cause diseases like
- at with antib

Virus	
ucture	nucleic acids, cell membrane, cytoplasm, divides into cells after g not require

SPECIALIZED C

DNA ho nform that c cell ca and what molecules it g make.

Example: White bloo animals are specializ pathogens like virus

Plant Part	Examples
leaf	cells c ing chloroplasts for photosynth cells c ol size of stomates (pores) allowing
stem	xylem cells move water and minerals and phlo nutrients like glucose throughout the plant u structures (provide support for leaves, branche
root	epidermis cells on root hairs increase surface area to allow for the absorption of water and mineral nutrients

CELL CYCLE

cell cycle: sequence of phases g of cell growth and division; timing and rate of cell cycle a to an organism's normal growth and development; c frequ y varies by cell type

Phase	Steps in Ph
interphase	G_1: intens und en duction S: DNA G_2: grow cell divi
mitosis	prophase → anapl telopha

cytok cytoplasm and organelles are d ed

mit during the cell cycle hich the nu is divided, resu l daughter cel same genetic information found in leus; pr ical f organism's growth

molecu ation: **Example:** DNA replication

f two s entary pairs; s uble

DNA on: process transfo e DNA into two identical c ies; en lp DNA strands unw nd each DNA strand s as a e (pattern) for a new complementary to form by matching (pairing) nitrogen each new molecule f the al molecule

CHA N CE

disruption of c cycle: loss of control within the cell cycle can lead iseases li ncer **Example:** Oncogenes cause uncontrollable cell sion, re ng in the formation and spread of cancerous tumors.

ell di entiation: process by which genetically identical cells (des d from the same parent cell and retaining the same DNA seq e) become more specialized and different from each other; RNA, and environmental factors can influence which genes are transcribed and expressed **Example:** Blood cells and muscle cells are differentiated and perform specific functions in an organism.

BIOMOLECULES

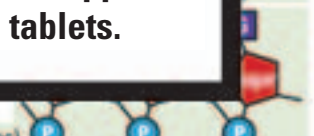
Biomolecule	Structure	Functions
carbohydrate (sugar, starch)	contains carbon, oxygen, and hydrogen atoms; ratio of hydrogen atoms to oxygen atoms is 2:1	source of energy (like glucose); structural molecule (like cellulose)
lipid (steroid, wax, oil, fatty acid)	contains carbon, oxygen, hydrogen, and possibly other atoms; ratio of hydrogen atoms to oxygen atoms is high; insoluble in water	source of energy; cell membrane component; protective coating (like wax); chemical messenger (like cholesterol)
protein	contains carbon, nitrogen	structural molecule s); e (like

tein

tains

complex molecules (polymers)

Example: DNA strand (linked nucleotides)



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