AP Biology
Chapter 6 Guided Reading Assignment

Name Answer Key

1. What is resolving power and why is it important in biology?

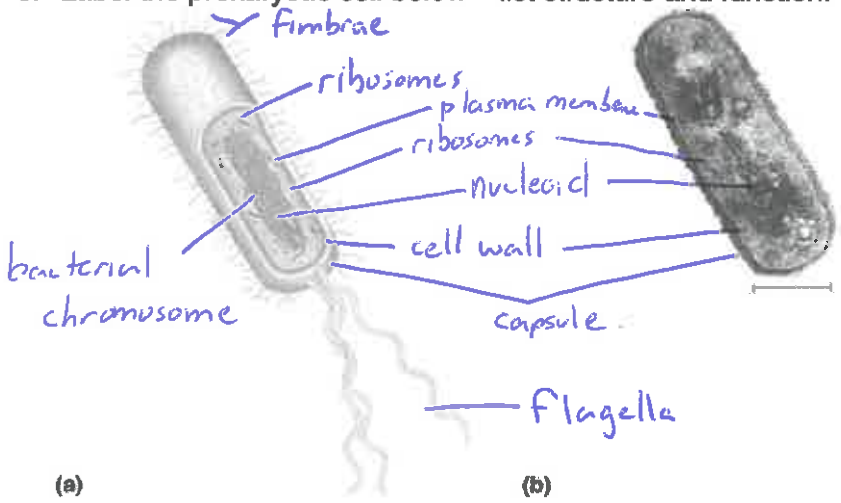
The ability of a microscope to clearly distinguish between two points

2. How does an electron microscope work and what is the difference between a scanning and transmission electron microscope?

SEM - focuses a beam of e^- onto the surface of a specimen → looks 3D

TEM - focuses a beam of e^- through the specimen → shows internal detail.

3. Label the prokaryotic cell below – list structure and function.



4. Why is surface area to volume such an important concept as it applies to the size of a cell?

As SA : V ratio ↓ diffusion slows down & becomes less efficient. Ratio goes down b/c of cell growth

5. For each of the structures below – note the specific structure and the function of the organelle or part of the organelle. The important concept is to note how the specific structure allows for the specific function to be accomplished.

a. Nucleus

i. Nuclear envelope - houses chromosomes, contains nucleoli, pores regulate entry + exit.

ii. Nuclear lamina – maintains shape of nucleus.

iii. Chromosomes - consist of discrete units of DNA

iv. Chromatin - consists of the DNA + proteins

v. Nucleolus - site of ribosomal synthesis.

b. Ribosomes
- made of rRNA, carry out protein synthesis

c. Endoplasmic reticulum

i. Smooth ER - lacks ribosomes, syntesis of lipids
metabolizes CHO's, detoxifies drugs + poisons,
stores Ca^+ ions

ii. Rough ER - bound ribosomes, → secrete glycoproteins
- distributes transport ~~resorbes~~ vesicles,
proteins surrounded by membranes
- membrane factory

d. Golgi Apparatus
- modifies products of ER
- manufactures certain macromolecules.
- sorts + packages materials into transport vesicles.

e. Lysosomes
- membranous sac containing hydrolytic enzymes.
that can digest macro molecules.
- recycle cells own organelles -

f. Vacuoles – derived from ER + Golgi Apparatus.

i. Food - formed by phagocytosis

ii. Contractile - found in many fresh water protists → pump water out of cells

ALL PART OF ENDOMEMBRANE SYSTEM

iii. Central w/tonoplast - found in plants → hold organic compounds + ~~water~~ H_2O

g. Endomembrane system – overall - complex & dynamic player in cell's compartmentalized ~~system~~ organization.

h. Mitochondria - site of cellular respiration → uses O_2 to make ATP

i. Plastids

i. Chloroplast - found in plants + algae → sites of photosynthesis

1. thylakoids - membranous sacks stacked into a granum

2. stroma - internal fluid

j. peroxisomes - bounded by a single membrane, produce hydrogen peroxide + convert it to water

k. cytoskeleton – pay careful attention to the details in this section

- helps support cell + maintain shape.
- interacts w/ motor proteins to produce motility

l. Cell walls

- protects plant cell, maintains shape, prevents excess take upot H_2O
- made of cellulose in plants.

m. Extracellular matrix

- made up of glycoproteins such as collagen, proteoglycans, + fibronectin
- ECM proteins bind to receptor proteins in plasma membrane called integrins.

n. What are intercellular junctions and why are they important?

b/c this aids in cell communication, interact, adhere through these junctions.

o. Contrast plasmodesmata, tight junctions, desmosomes, and gap junctions.

plasmodesmata → channels that perforate cell walls.

tight junctions → membranes pressed together preventing ~~leakage~~ leakage of ECF.

desmosomes → fasten cells together in strong sheets.

gap junctions → communication junctions