Bio 2, CHAPTER 4

A Tour of the Cell

The Cell Theory

■_____ were discovered in 1666 when the first _____ were invented

■When _____ microscopes were invented, smaller parts of the cell, called _____ were discovered.

■Examples of organelles are the nucleus, _____, chloroplasts, lysosomes, and golgi bodies.

■All living things are divided into two groups based on whether their cells have _____ or not

■(see next slide)

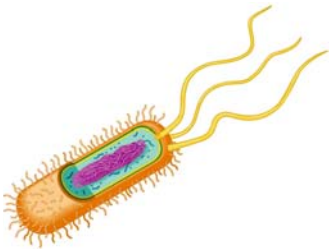
Prokaryotes versus Eukaryotes

■_____ have no organelles Example; _____

■_____ have organelles Examples; _____ and _____

■Prokaryotic cells

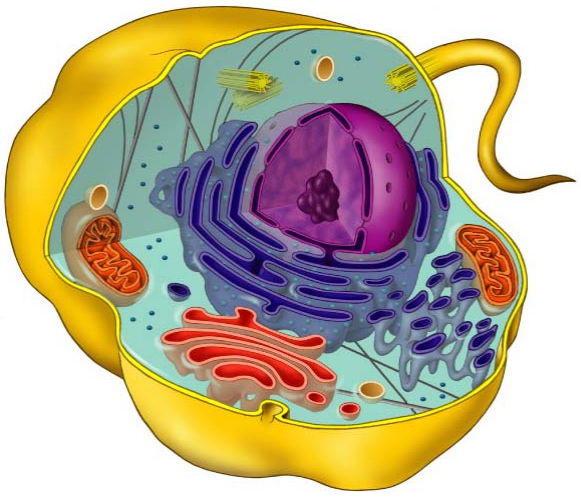
- Are smaller than _____ cells
- Lack internal structures surrounded by _____
- Lack a _____
- May posses _____ or other external features

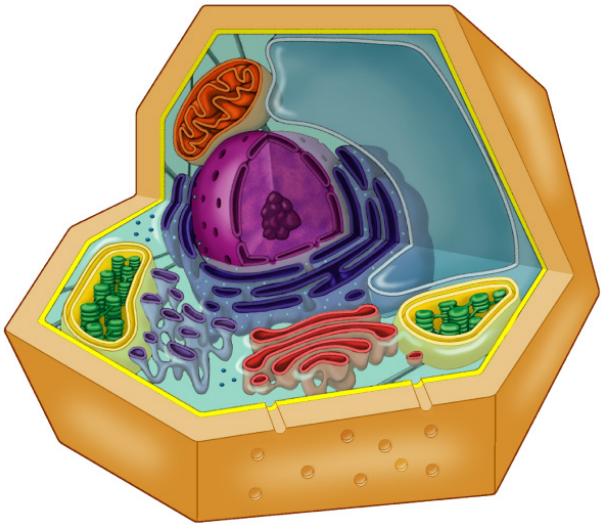


■Eukaryotic cells

- ■Are larger than _____ cells
- ■Posses internal _____ surrounded by _____
- ■Posses a _____
- ■May posses _____ or other external features

■Fill in figures below:





All living cells; common characteristics

■Both _____ and _____ cells have at least these 3 things in common;

■A cell membrane (_____ permeable)

■_____ used to control cell activity and code for proteins.

■_____; the liquid part of the cell

■Many prokaryotes and eukaryotes have a _____ for external support (no _____ cells do).

Cell membranes

▪Composed of _____ bilayer.

▪The phospholipids have _____ (water loving) heads (purple) and (_____ water) hating tails.

▪The _____ in the membrane act as channels for non-_____ molecules, receptors for hormones, or _____ to help chemical reactions take place quickly

There are also molecules of cholesterol and _____ on the surface. The carbohydrates identify the cell as belonging inside the organism or as an _____.

Selective Permeability

- Membranes of the cell are _____ permeable (sometimes called _____)
    - They allow some substances to _____ more _____ than others
    - They _____ passage of some substances _____
    - Without this _____, the cell could not _____

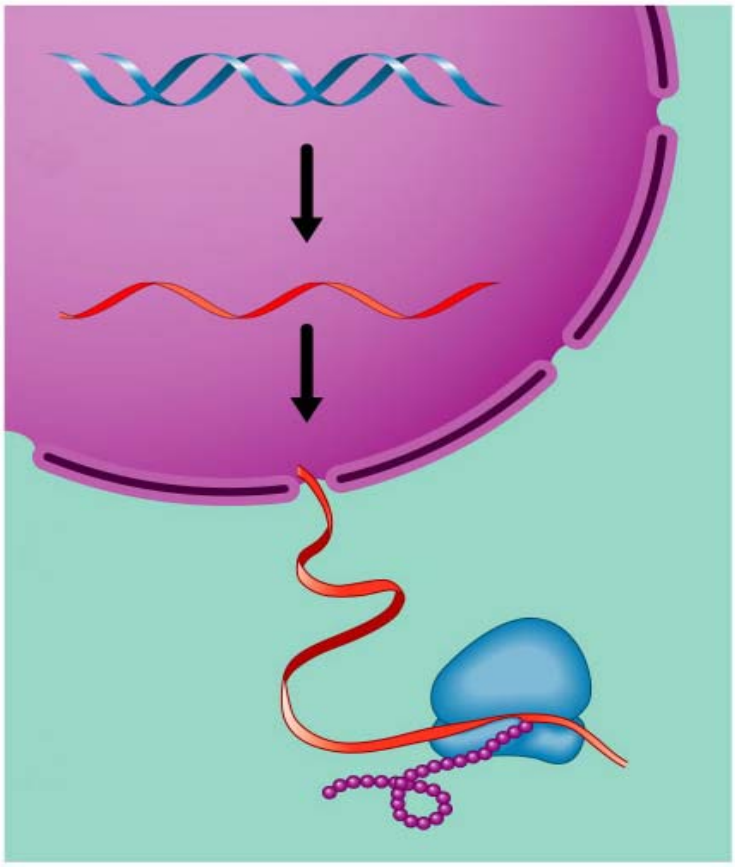
THE NUCLEUS AND RIBOSOMES:GENETIC CONTROL OF THE CELL

- The _____ is the storehouse of _____ and the _____ of the cell
    - _____ in the nucleus store information necessary to produce _____
    - The information must be copied from the _____ and then taken out to the _____ for _____ synthesis
- _____ build all the cell's _____ using information sent from the nucleus in the form of _____.

Structure and Function of the Nucleus

- The nucleus is bordered by a double membrane called the nuclear _____
    - It contains _____ (uncoiled chromosomes)
    - Chromatin = _____ wrapped around _____
    - It contains a _____ (containing _____)

How DNA Controls the Cell



- _____ controls the cell by transferring its coded information into _____
  - The _____ in the RNA is used to make _____ at the _____
  - After the _____ is produced, the _____ is recycled back to the _____

The Endoplasmic Reticulum

- The _____ (ER)
  - Produces an enormous variety of _____
  - Is composed of _____ and _____ ER

The rough endoplasmic reticulum

- The "_____" of the rough ER is due to _____ that stud the outside of the ER membrane
- The functions of the rough ER include
  - _____ (most important)
  - Producing new _____
- After the rough ER synthesizes a molecule it may _____ the molecule into a _____

- The _____ then move to the cell _____ and release the newly formed _____ outside of the _____
- The _____ apparatus
    - Works in partnership with the ____
    - Refines, _____, and distributes the _____ of cells

Lysosomes

- A _____ is a membrane-enclosed sac
    - It contains digestive _____
    - The _____ break down macromolecules or small _____ (like bacteria)
    - The _____ may also be used to recycle damaged _____
- Lysosomes have several types of _____ functions
    - They fuse with _____ vacuoles to _____ the food _____
    - They break down damaged _____
    - _____)
- Vacuoles are membranous _____
    - The two types of _____ are;
    - contractile vacuoles of protists (_____)
    - the central vacuoles of plants (_____)

CHLOROPLASTS

- _____ are the sites of _____, the conversion of _____ energy to chemical energy

Mitochondria

- _____ are the sites of cellular _____, which involves the production of _____ from _____ molecules

Maintaining Cell Shape; the Cytoskeleton

- The _____ is an infrastructure of the cell consisting of a _____
- One function of the _____
    - Provide _____ support to the cell and maintain its _____

Cilia and Flagella

- _____ propel the cell in a _____ motion
- _____ move in a coordinated _____ motion
- Some cilia or flagella extend from _____ cells
    - The human _____ is lined with _____

Review Questions

Make sure you can fill in and describe the figures from the notes, above

1. When were the first cells discovered?
2. What parts of cells were not visible through the first microscopes?
3. What are the two groups of organisms, based on the presence or absence of organelles?
4. Which type of organism has no organelles?
5. Which type of organism has organelles?
6. What are some examples of eukaryotes?
7. How are prokaryotic cells different from eukaryotic cells (several ways)?
8. What are the common characteristics of all living cells?
9. What is the liquid part of the cell?
10. Do any animals have cell walls?
11. What is a cell membrane composed of?
12. What membrane structures act as channels, receptors, and enzymes?
13. What is the surface of a cell membrane like?
14. What is the term for how membranes allow some substances to cross the membrane more easily than others?
15. Where are all proteins made?
16. Without membrane selectivity, what would happen to cells?
17. What causes the roughness in rough ER?
18. What molecule moves the information for proteins to the ribosomes?
19. What molecule stores the genetic information?
20. What is the name of the membrane bound bubble that can contain all types of substances inside a cell?
21. Can the DNA move out into the cytoplasm to do protein synthesis?
22. How does the ribosome receive the information to make proteins?
23. What covers the nucleus?
24. Do all cilia and flagella help a cell move? Which ones?
25. What is a membrane-enclosed sac that contains digestive enzymes?
26. What two forms does ER come in?
27. What is an uncoiled chromosome made from DNA coiled around proteins?
28. What organelle is the site of photosynthesis?
29. Can all materials move across a membrane? Which ones can? Cannot?
30. What organelle is an infrastructure that supports the shape of the cell?
31. What structure inside the nucleus holds the RNA?

32. What two organelles move to help a cell move through water?
33. What happens to the mRNA after the protein is produced?
34. What do the enzymes inside lysosomes do?
35. What do contractile vacuoles do?
36. What organelle is the site of cellular respiration?
37. What is the storehouse of genetic information for the production of proteins?
38. What does ER stand for in a cell?
39. What is the most important function of rough ER?
40. What happens to vesicles that contain molecules not used inside the cell?
41. What organelle refines, stores, and distributes the products of cells?
42. How do lysosomes fuse with vacuoles to digest small particles?
43. What are the two types of vacuoles?
44. What do central (water) vacuoles do?