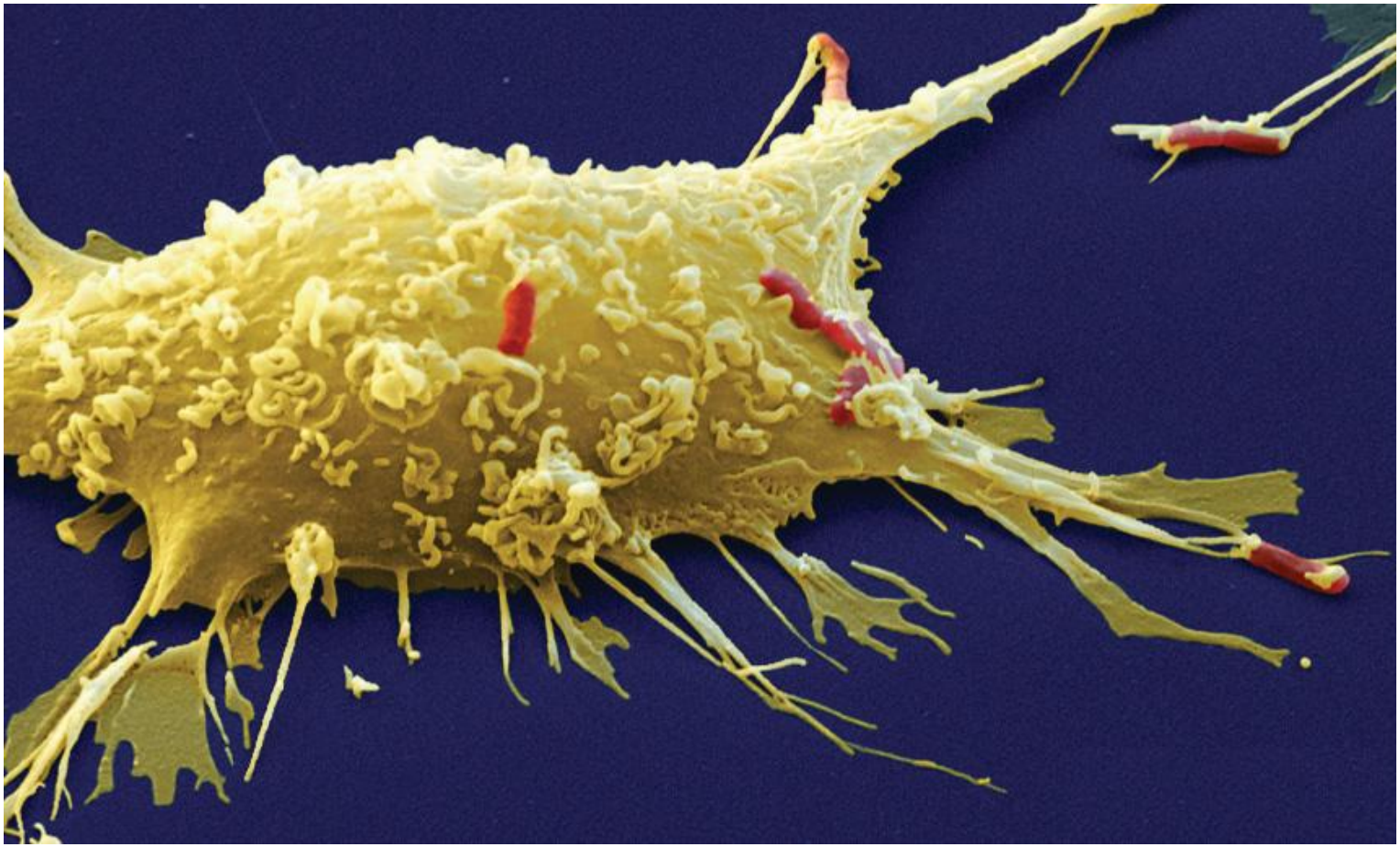
Ch 3: Cell Theory and Structure

KEY CONCEPT **Cells are the Basic unit of life.**



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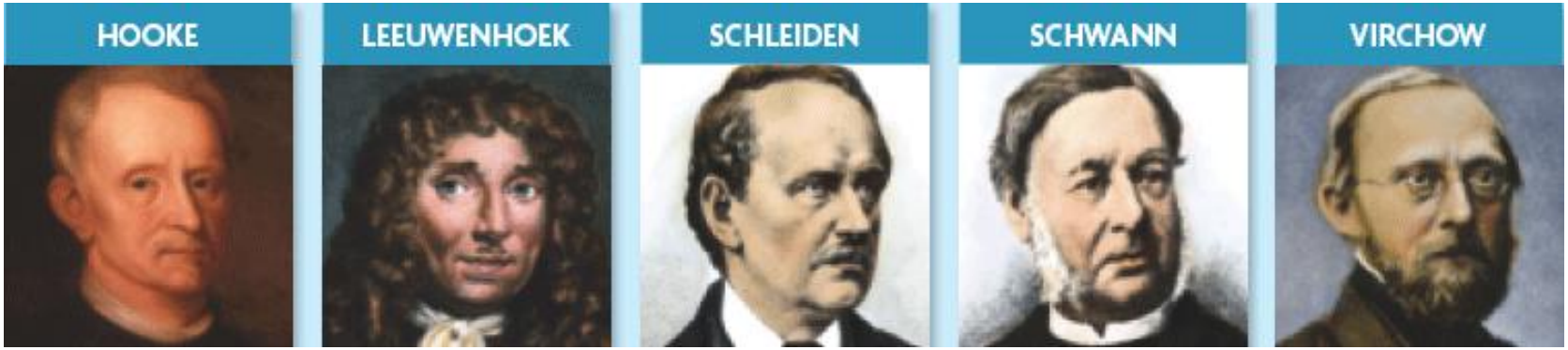
- **The cell theory grew out of the work of many scientists and improvements in the microscope.**
  - Many scientists contributed to the cell theory.



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  - Many scientists contributed to the cell theory.
  - More was learned about cells as microscopes improved.

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- **The cell theory grew out of the work of many scientists and improvements in the microscope.**
  - Many scientists contributed to the cell theory.
  - More was learned about cells as microscopes improved.
  - The cell theory is a unifying concept of biology.

Ch 3: Cell Theory and Structure

- **Early studies led to the development of the cell theory.**
  - The Cell theory has three principles.
    - All organisms are made of cells.

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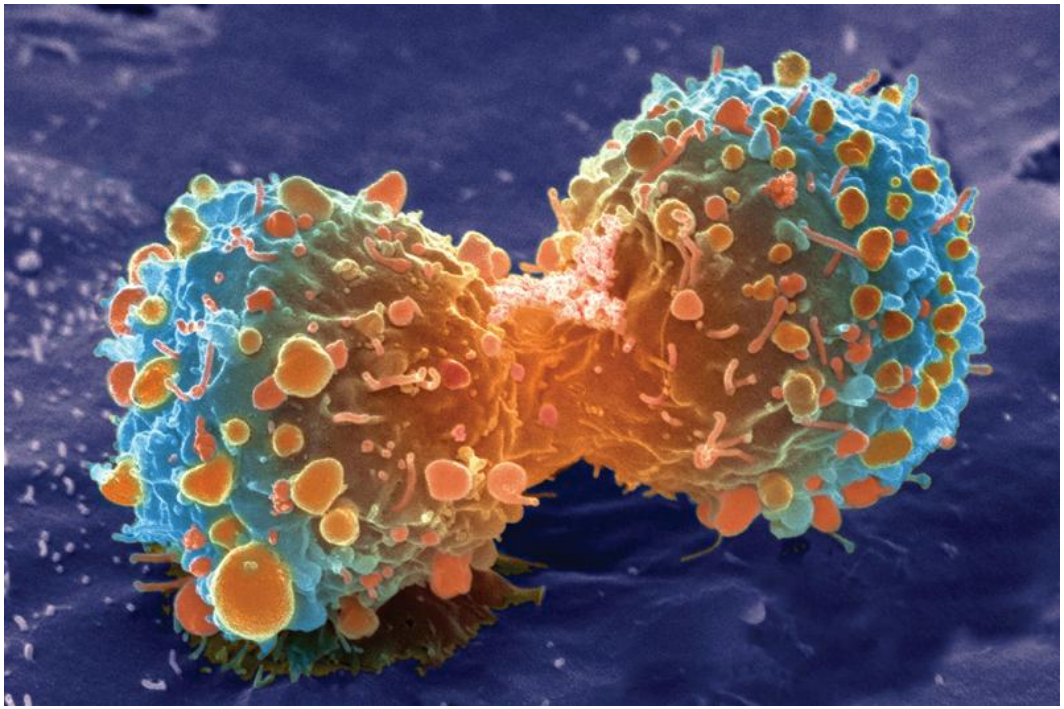
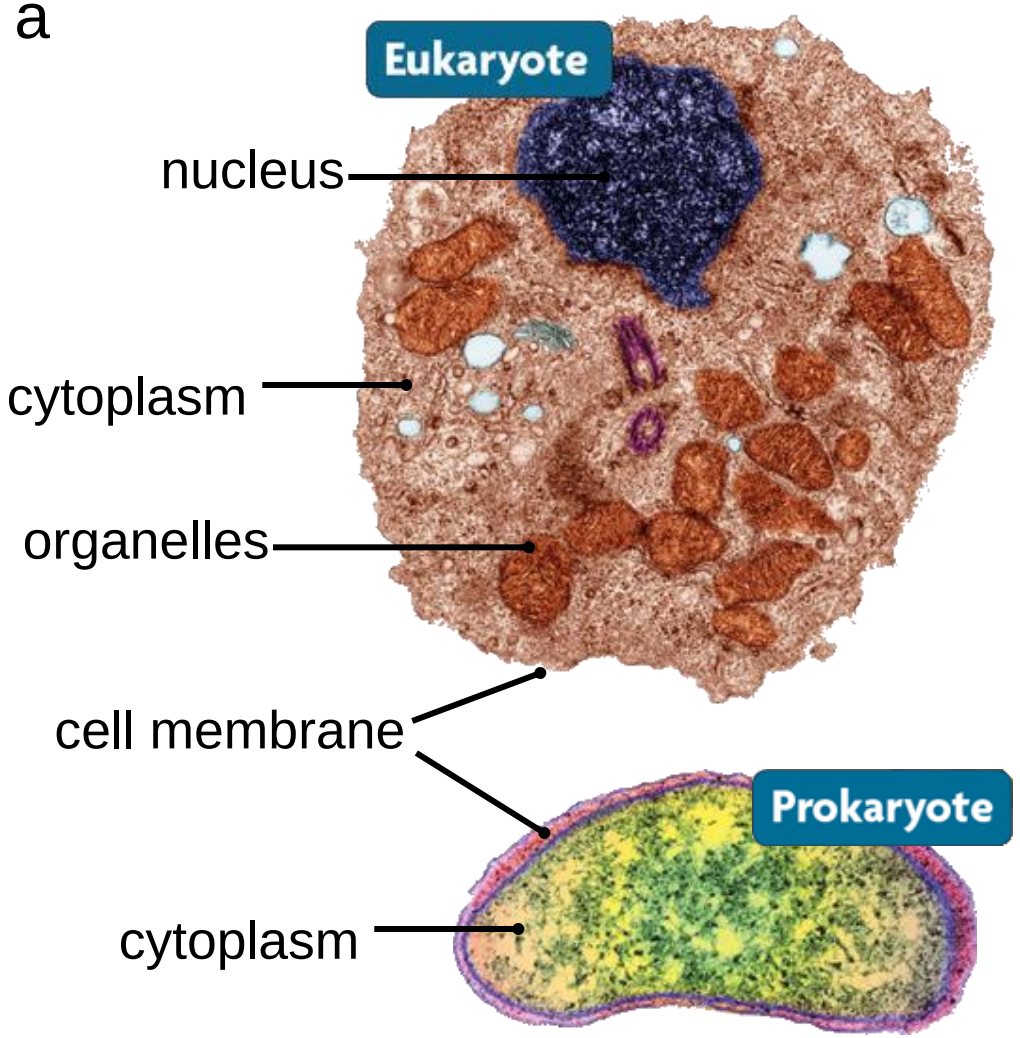


Ch 3: Cell Theory and Structure

- **Early studies led to the development of the cell theory.**
  - The Cell theory has three principles.
    - All organisms are made of cells.
    - All existing cells are produced by other living cells.
    - The cell is the most basic unit of life.

Ch 3: Cell Theory and Structure

- **There are two cell types: eukaryotic cells and prokaryotic cells.**
  - Eukaryotic cells have a nucleus.
  - Prokaryotic cells do not have membrane-bound organelles.



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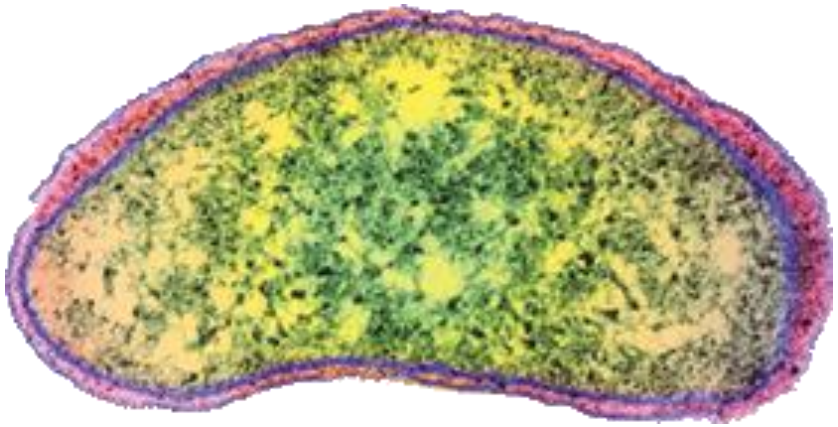
- **Prokaryotic cells lack a nucleus and most internal structures of eukaryotic cells.**
  - All cells share certain characteristics.
    - Cells tend to be microscopic.



Bacterium
(colored SEM; magnification 8800x)

Ch 3: Cell Theory and Structure

- **Prokaryotic cells lack a nucleus and most internal structures of eukaryotic cells.**
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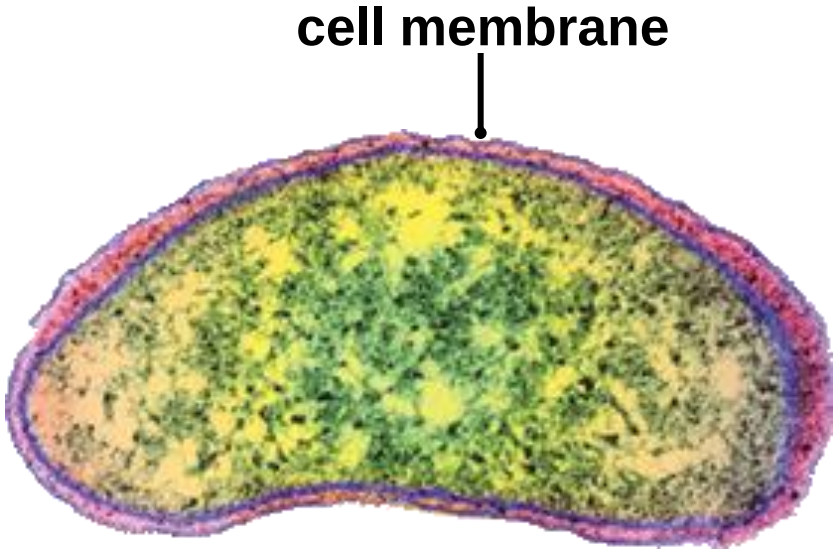

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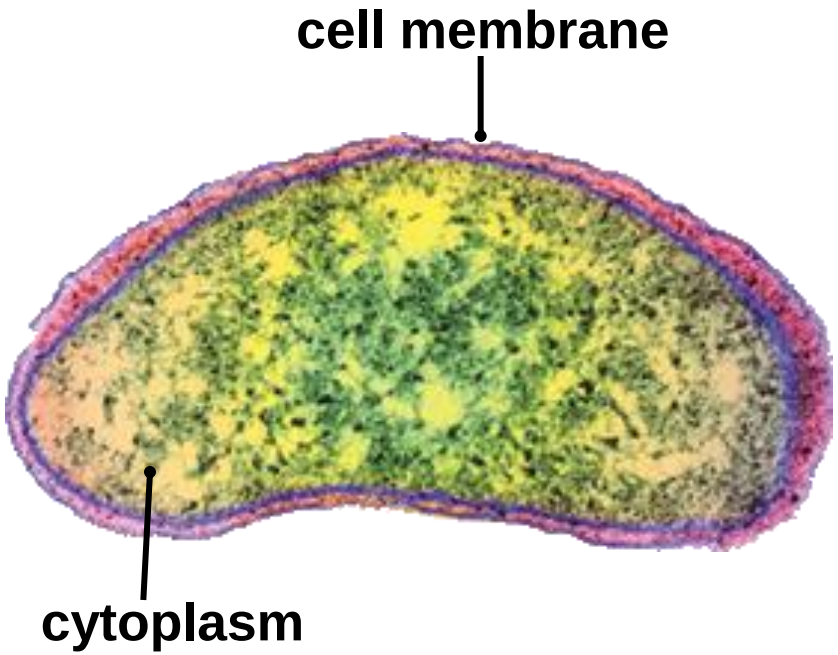
Ch 3: Cell Theory and Structure

- **Prokaryotic cells lack a nucleus and most internal structures of eukaryotic cells.**
  - All cells share certain characteristics.
    - Cells tend to be microscopic.
    - All cells are enclosed by a membrane.
    - All cells are filled with cytoplasm.



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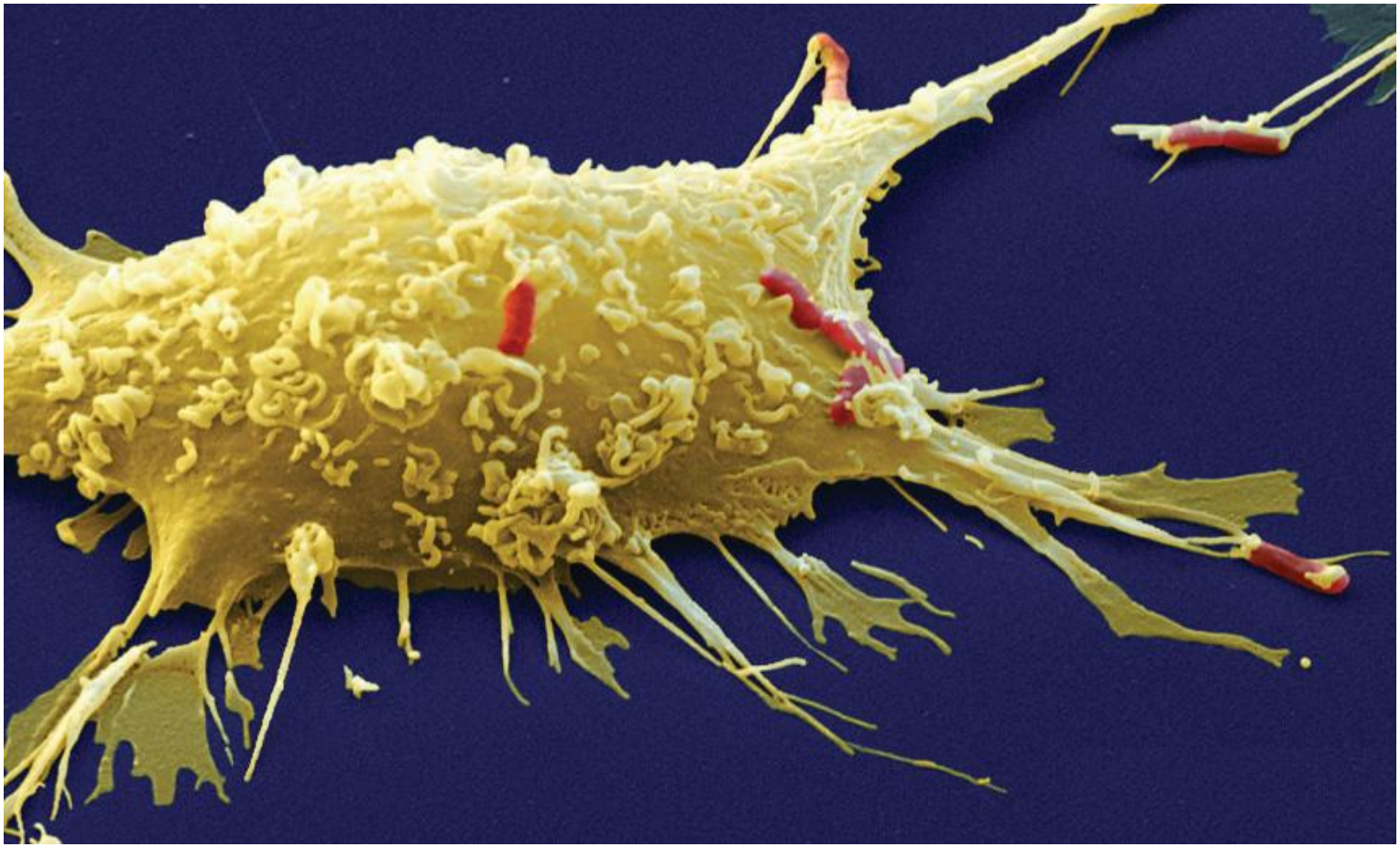
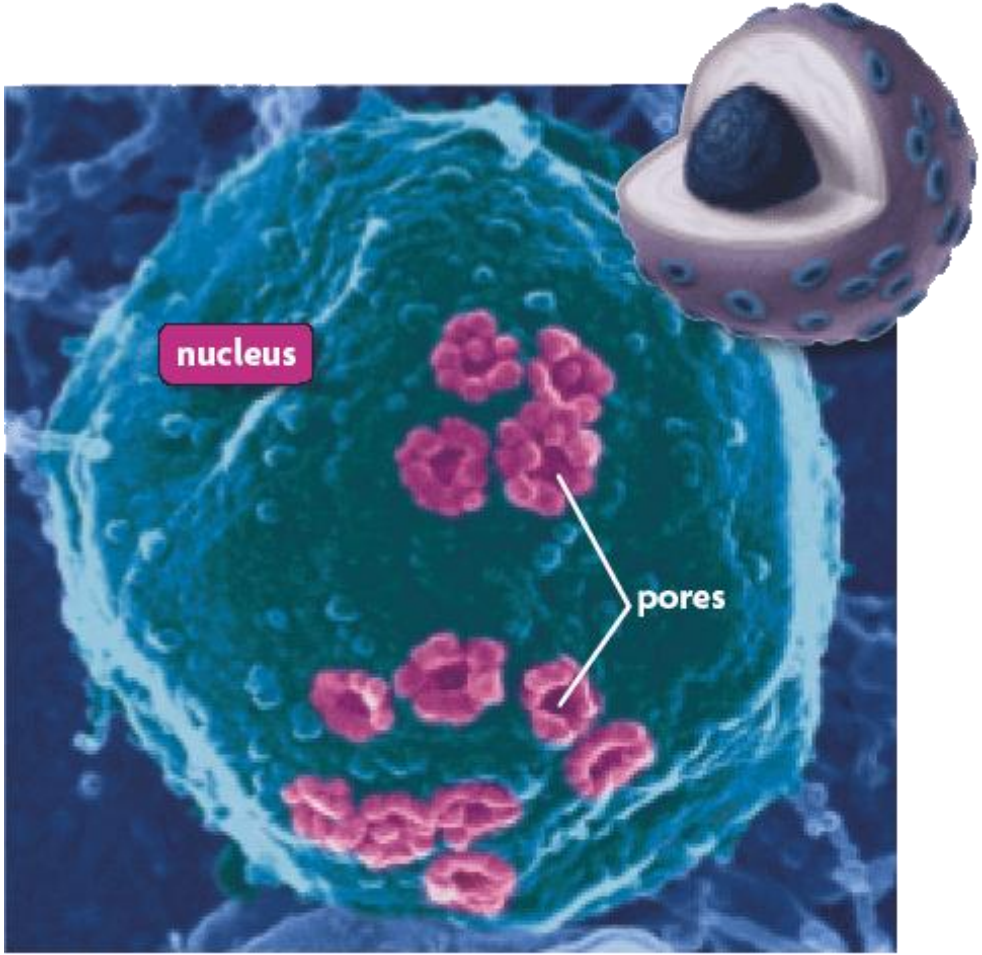
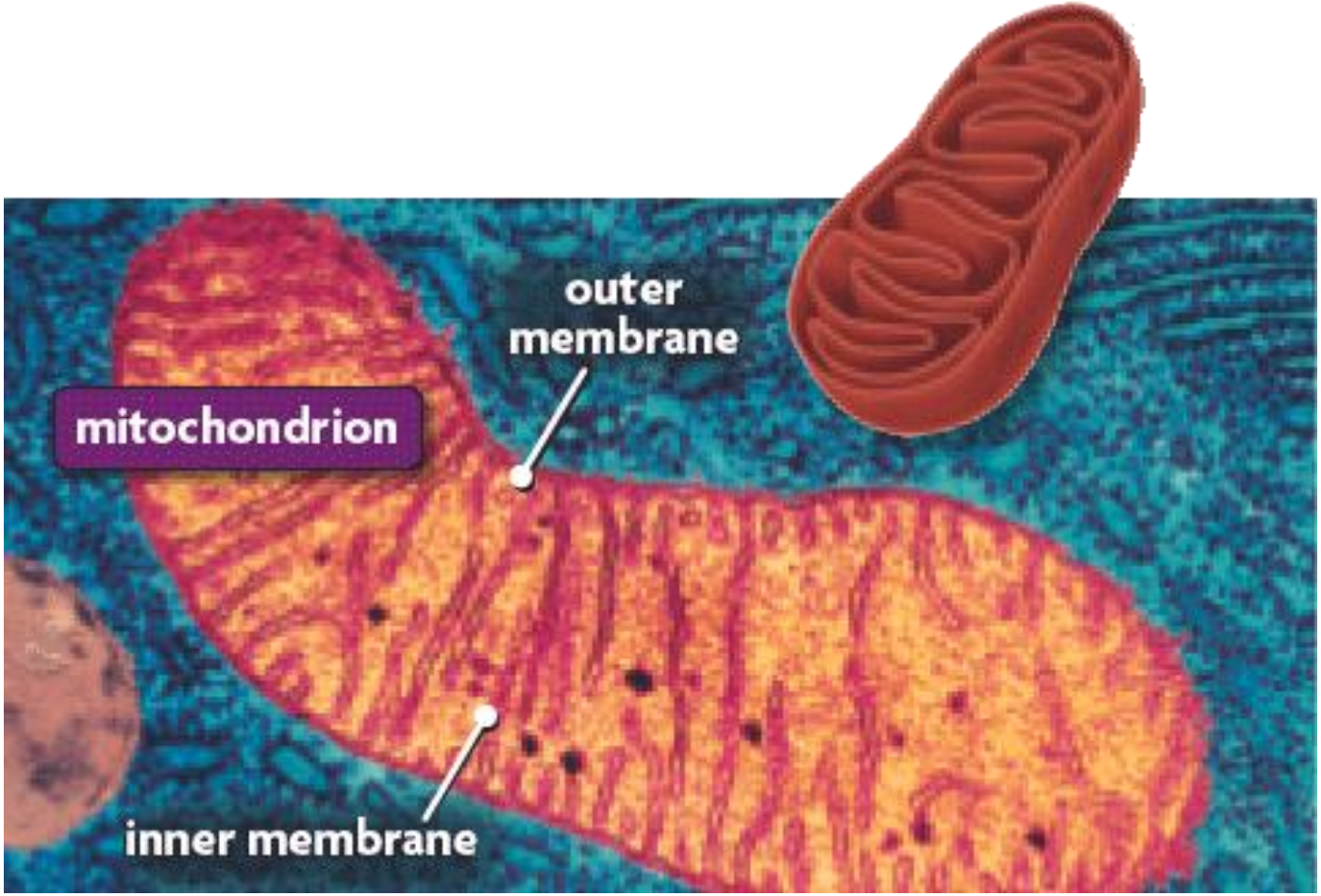
KEY CONCEPT **Eukaryotic cells share many similarities.**



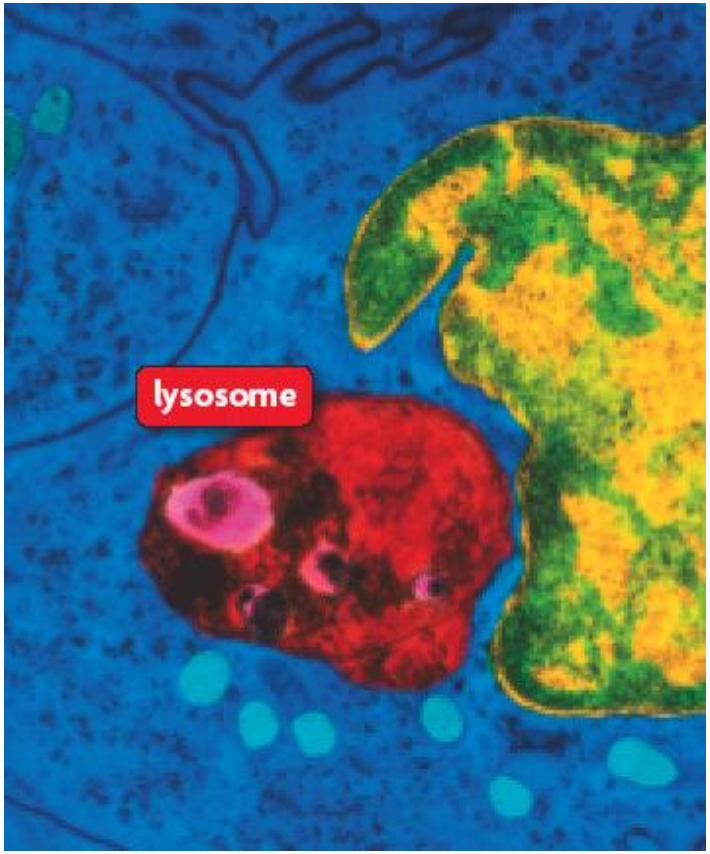
Nucleus contains the chromosomes which are composed of DNA (a chemical compound called deoxyribonucleic acid); functions in the genetic control of the cell.



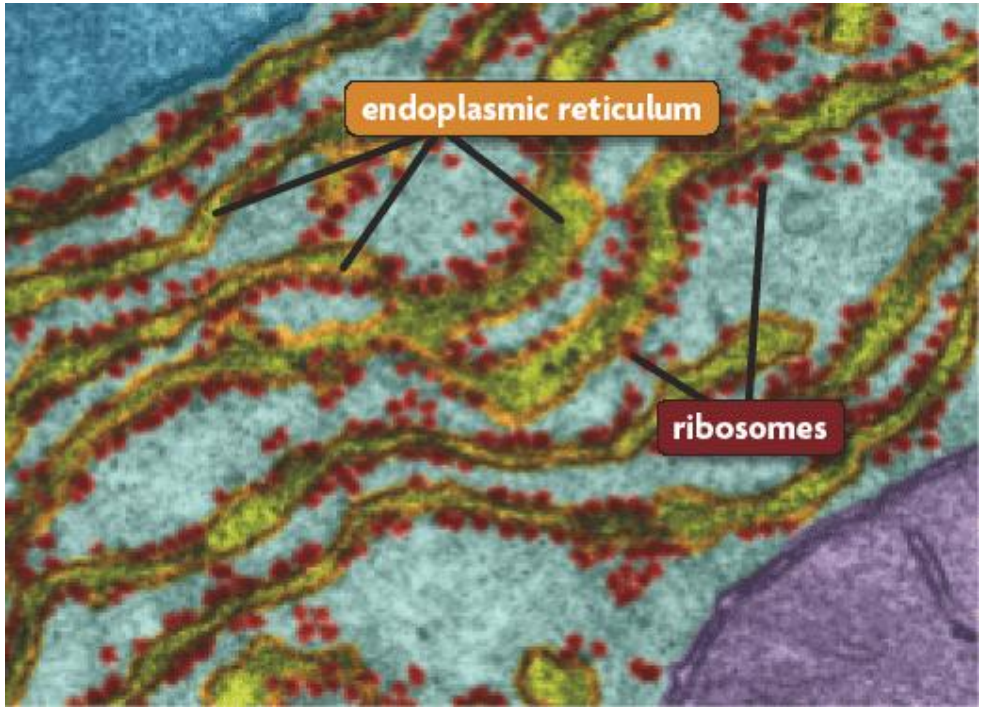
Mitochondria are the sites of cellular respiration, a process which supplies the cell with energy.



Lysosomes contain chemicals called ***enzymes*** necessary for digesting certain materials in the cell.



Endoplasmic reticulum (ER) is a complex, extensive network that transports materials throughout the inside of a cell.



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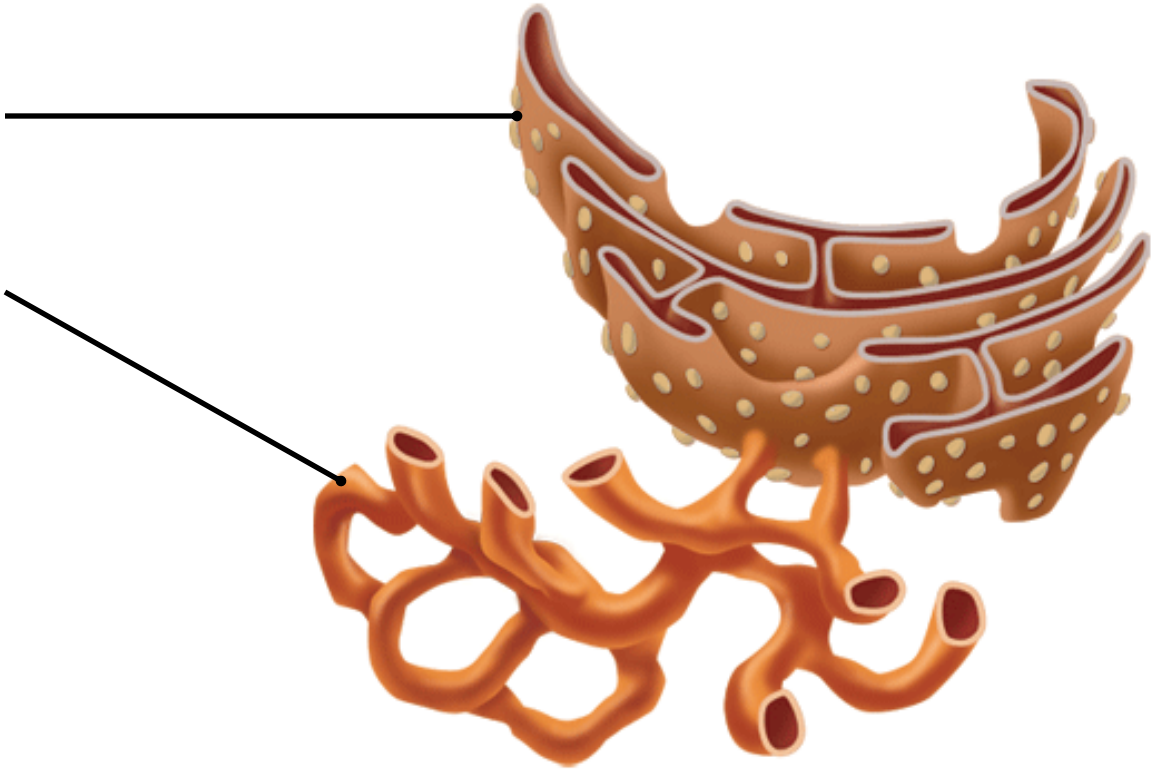
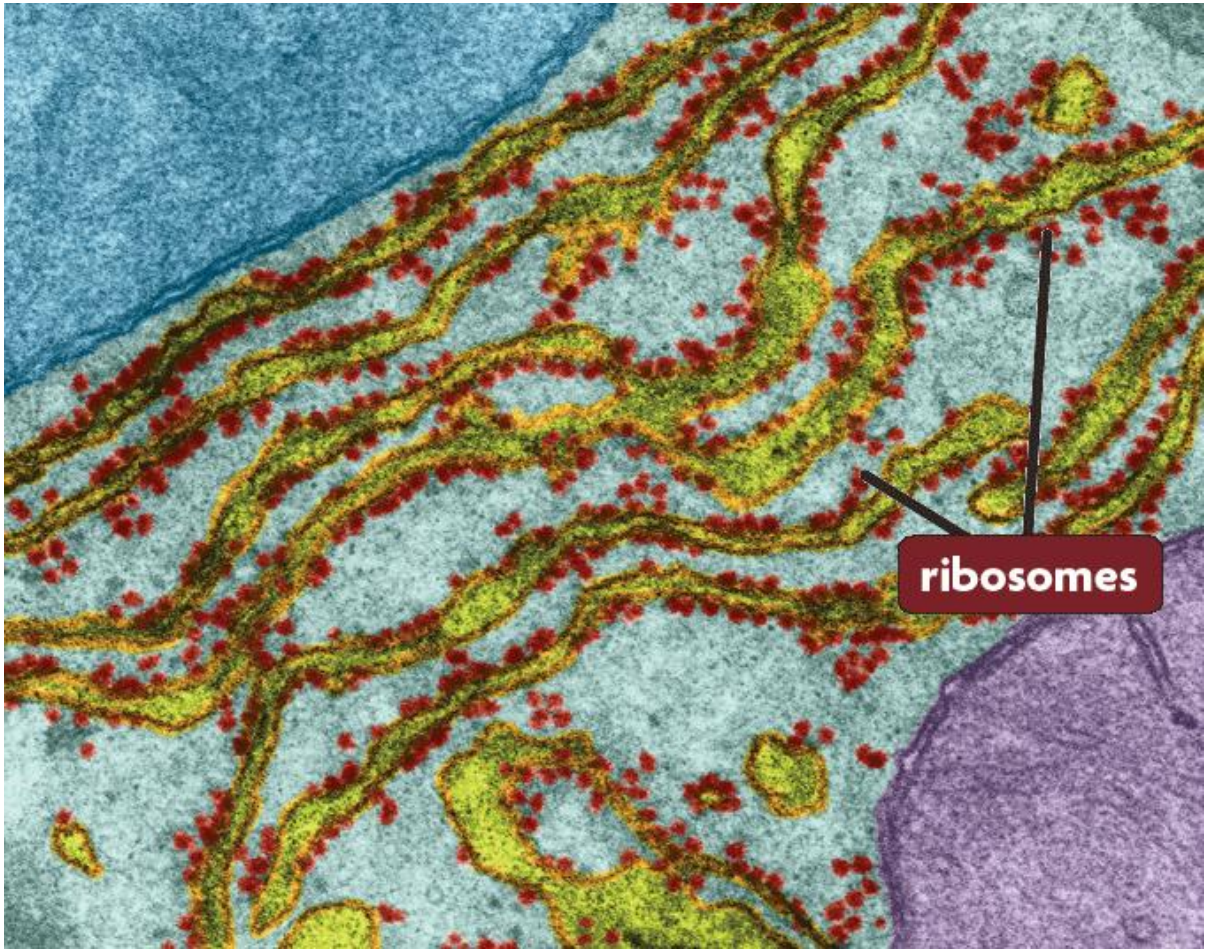
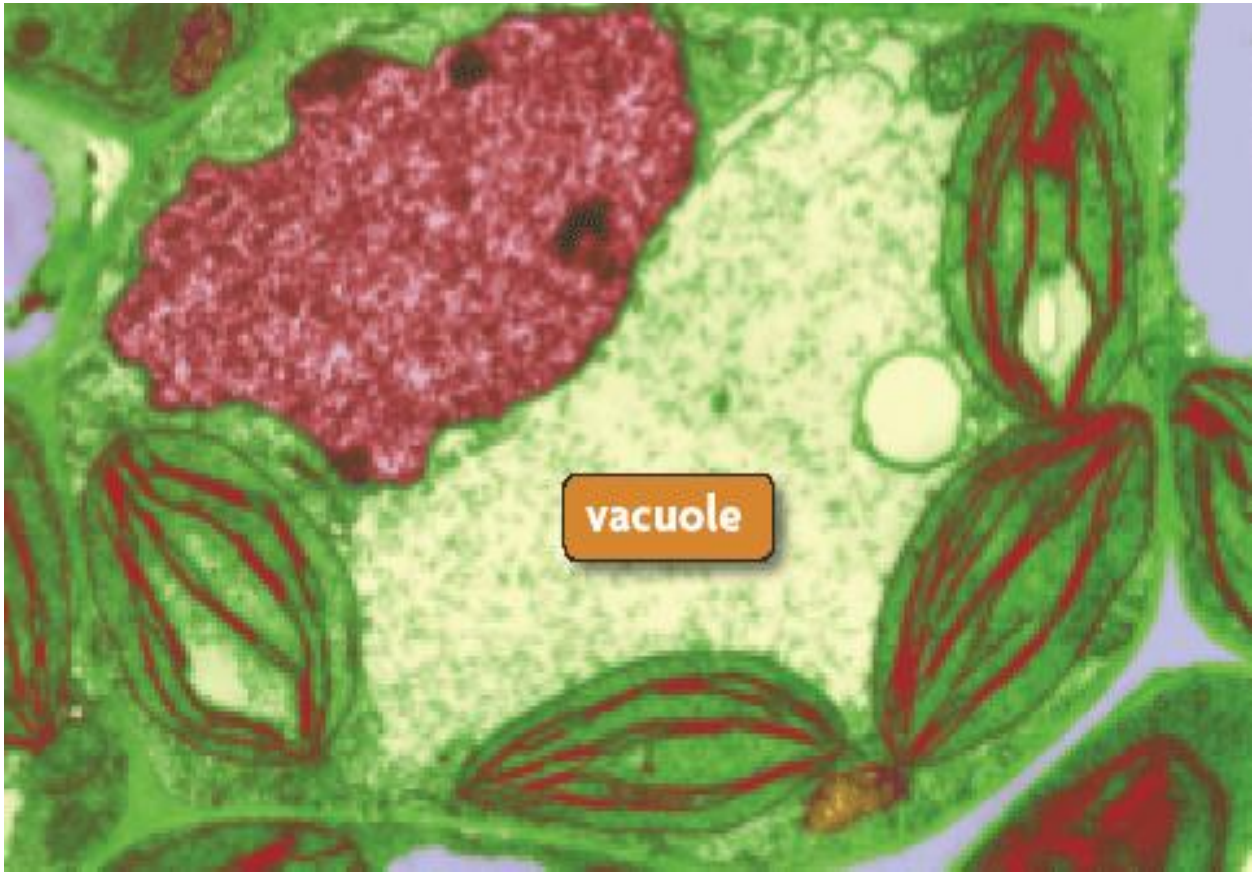
- There are two types of endoplasmic reticulum.
  - rough endoplasmic reticulum
  - smooth endoplasmic reticulum



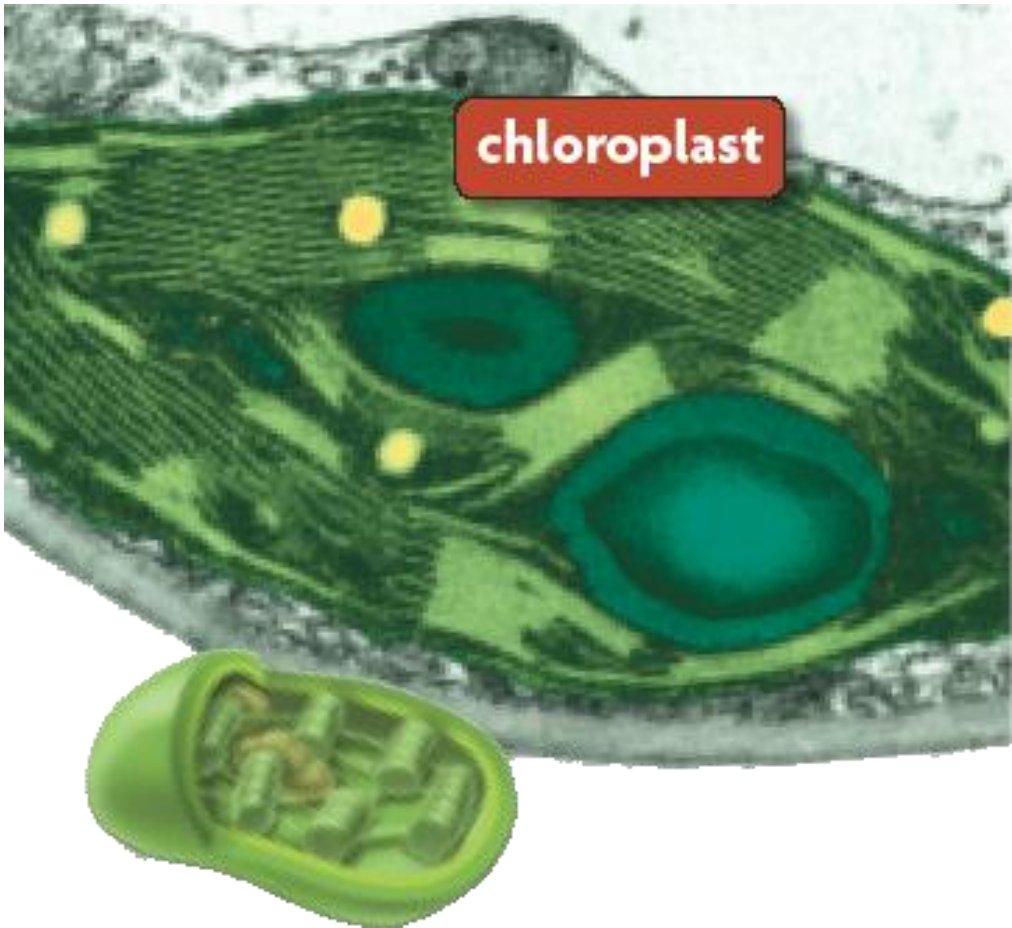
Ribosomes are the sites of protein synthesis. They link Amino Acids together; some are located on the ER, others are found in the cytoplasm.



Vacuoles store materials such as water, salts, proteins, and carbohydrates; vacuoles in animal cells (if they are present) are much smaller than those in plant cells.



Chloroplasts are found only in plant cells, contain the green pigment, ***chlorophyll***, which absorbs energy from the Sun to convert carbon dioxide and water into sugar through the process of photosynthesis.



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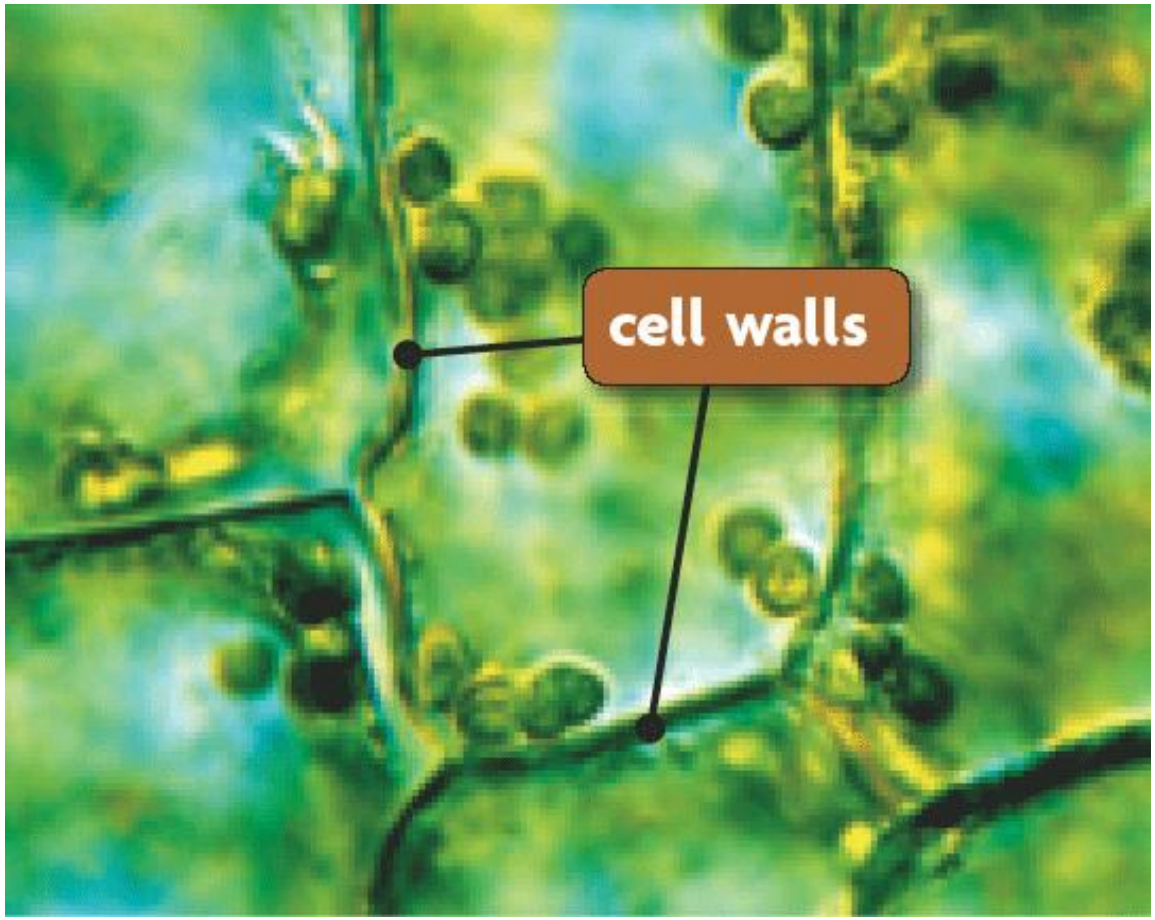
- **Plant, Fungi, and some Protist cells have cell walls.**
  - A cell wall provides rigid support and protection.



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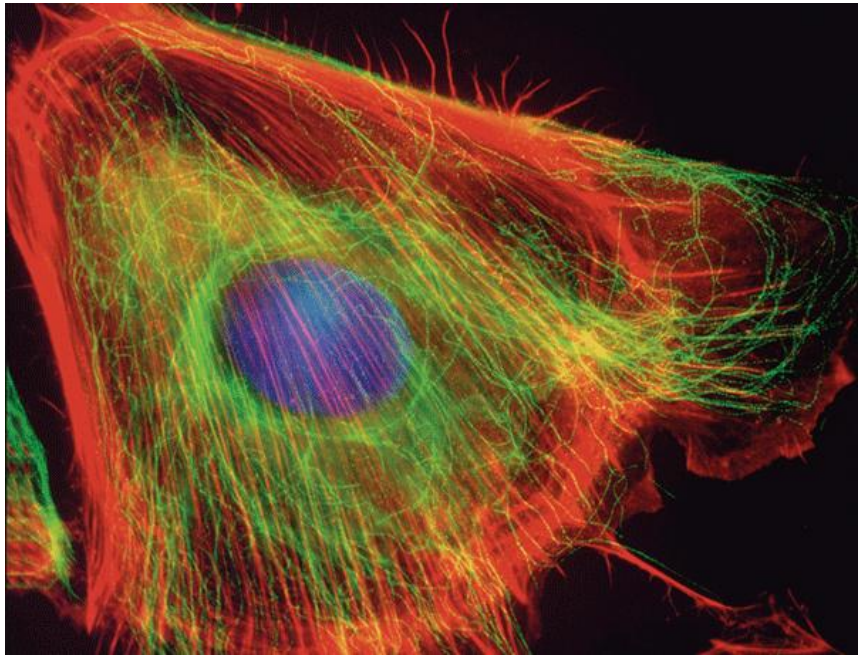
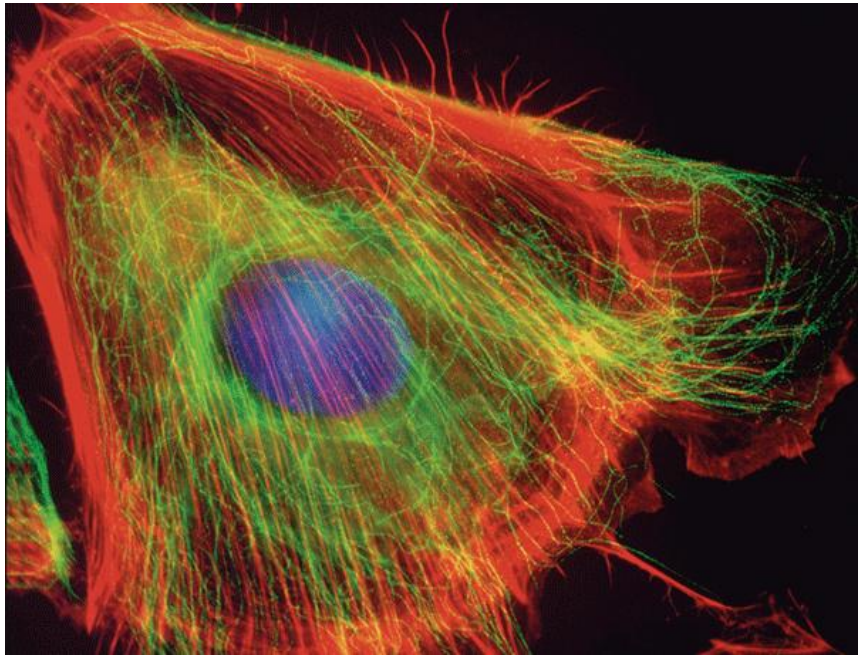
- **Cells have an internal structure.**



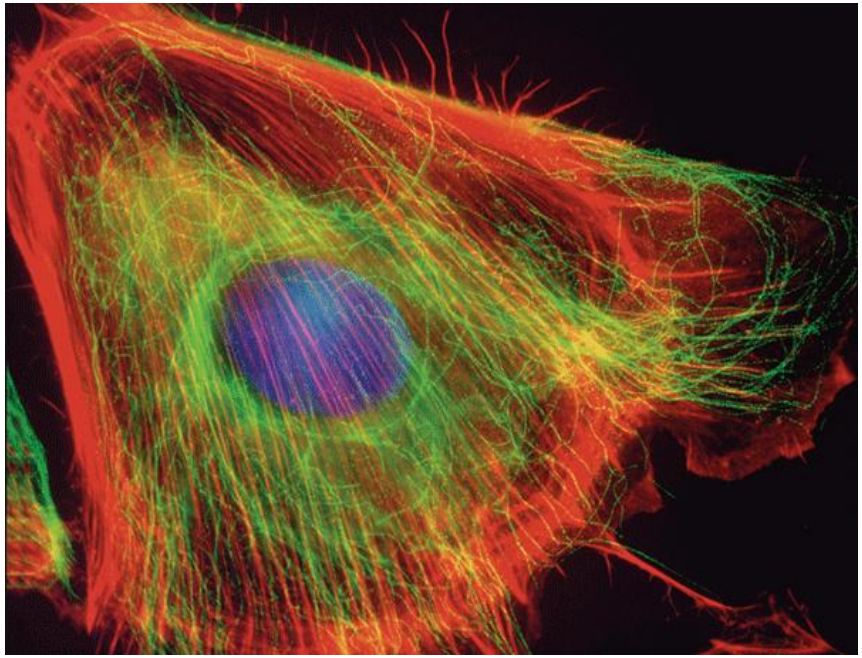
Ch 3: Cell Theory and Structure

- **Cells have an internal structure.**
  - The cytoskeleton has many functions.



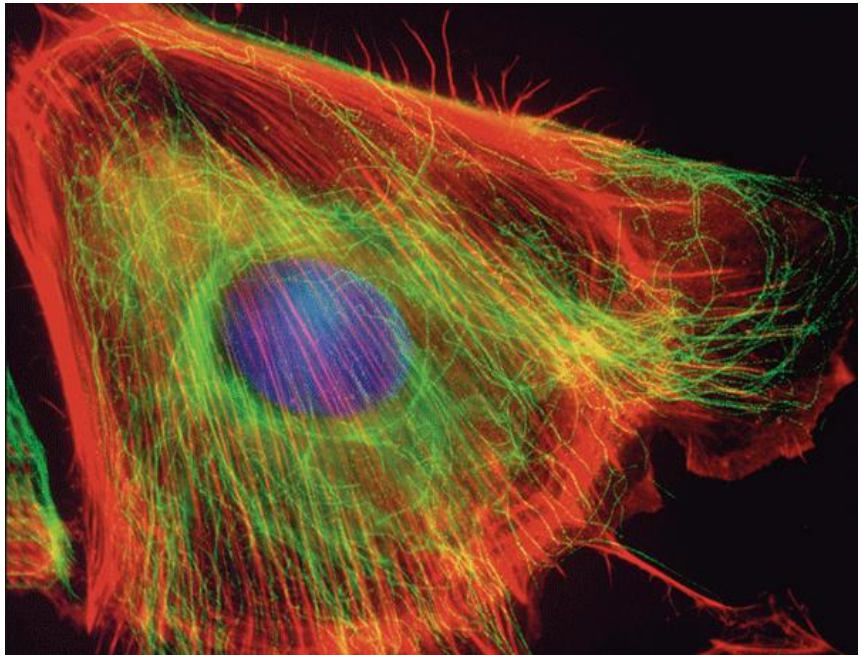
Ch 3: Cell Theory and Structure

- **Cells have an internal structure.**
  - The cytoskeleton has many functions.
    - supports and shapes cell



Ch 3: Cell Theory and Structure

- **Cells have an internal structure.**
  - The cytoskeleton has many functions.
    - supports and shapes cell
    - helps position and transport organelles



Ch 3: Cell Theory and Structure

- **Cells have an internal structure.**
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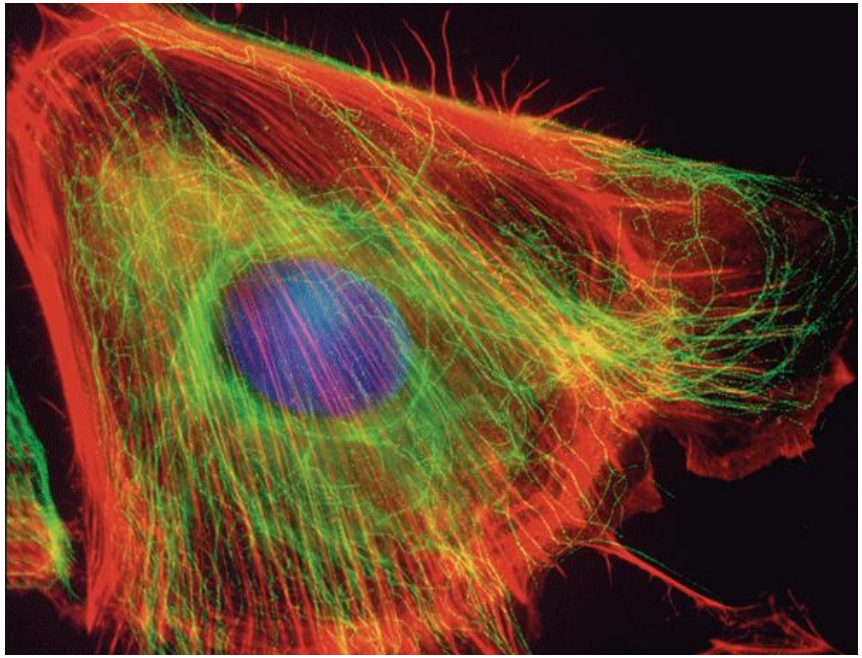
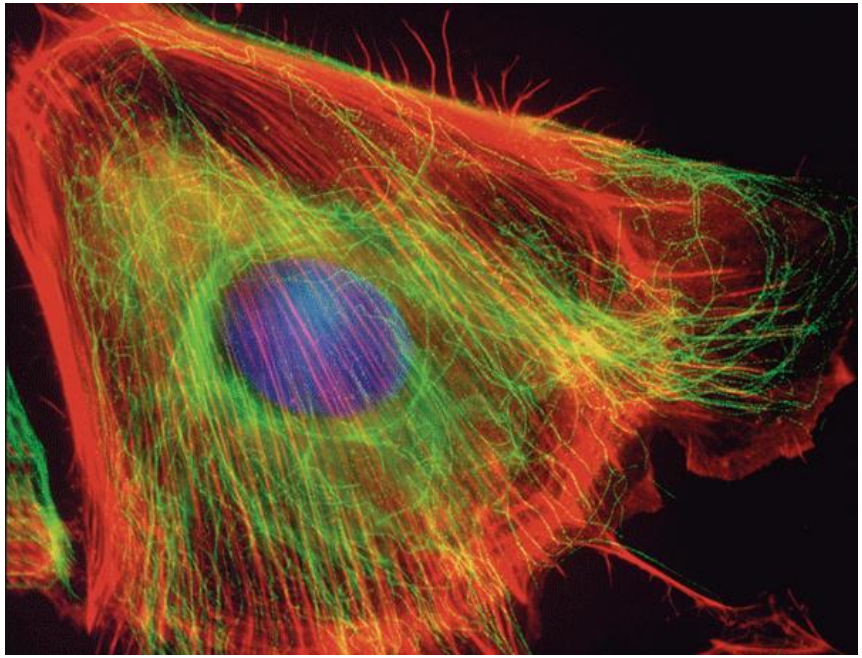
    - supports and shapes cell
    - helps position and transport organelles
    - provides strength



Ch 3: Cell Theory and Structure

- **Cells have an internal structure.**
  - The cytoskeleton has many functions.
    - supports and shapes cell
    - helps position and transport organelles
    - provides strength
    - assists in cell division



Ch 3: Cell Theory and Structure

- **Cells have an internal structure.**
  - The cytoskeleton has many functions.
    - supports and shapes cell
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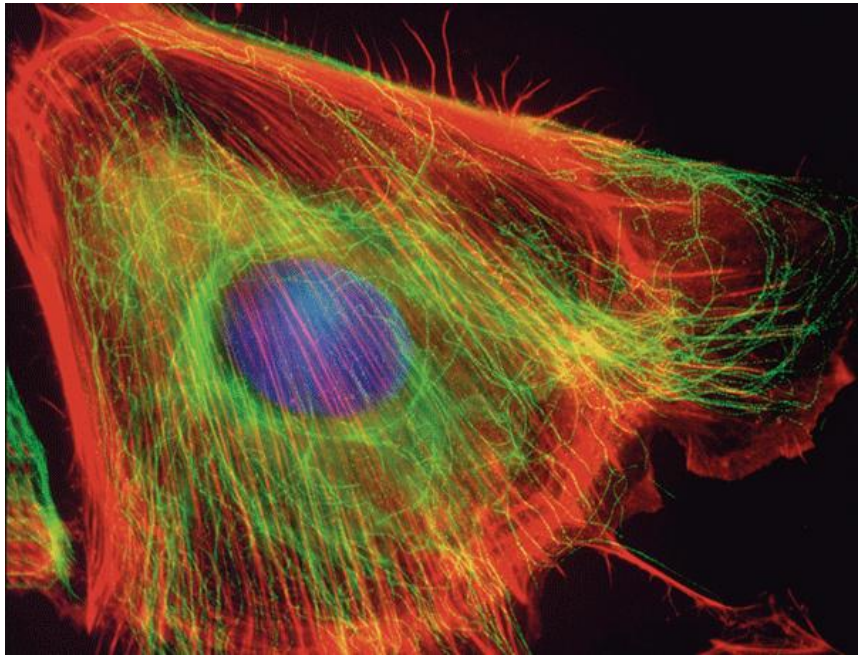
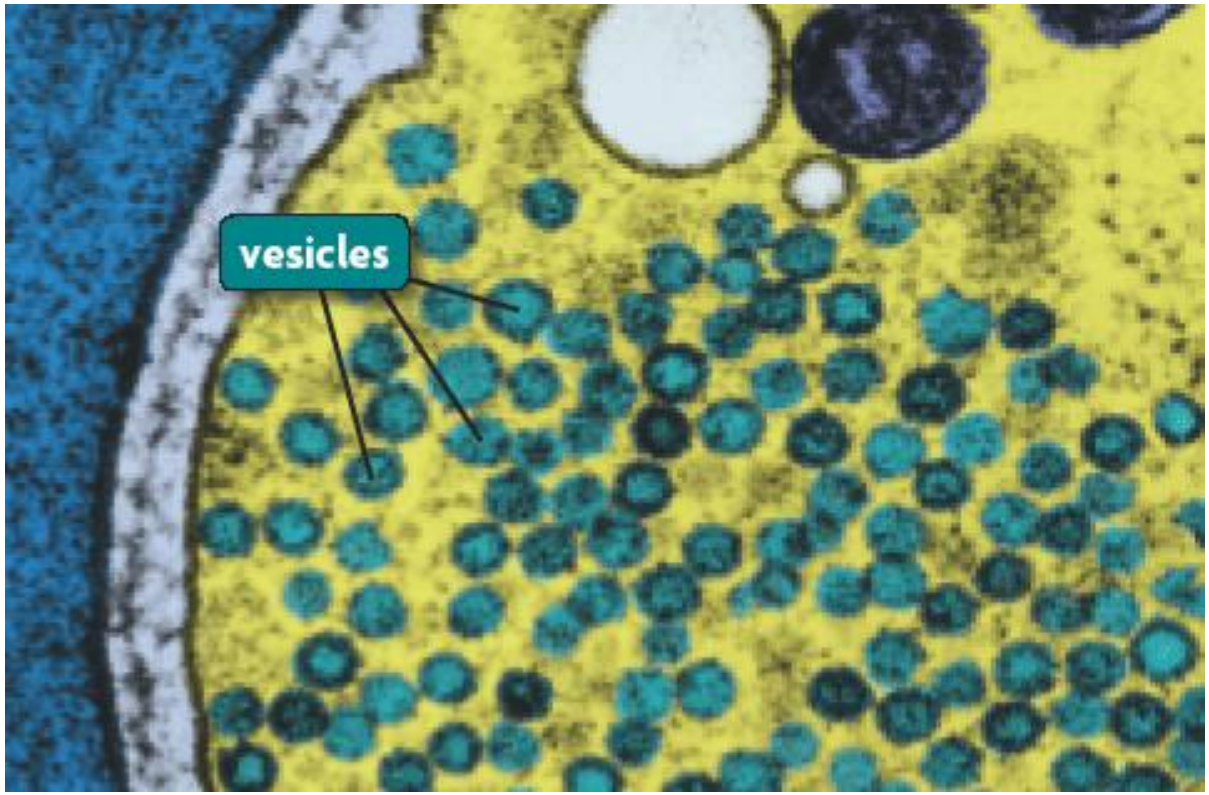
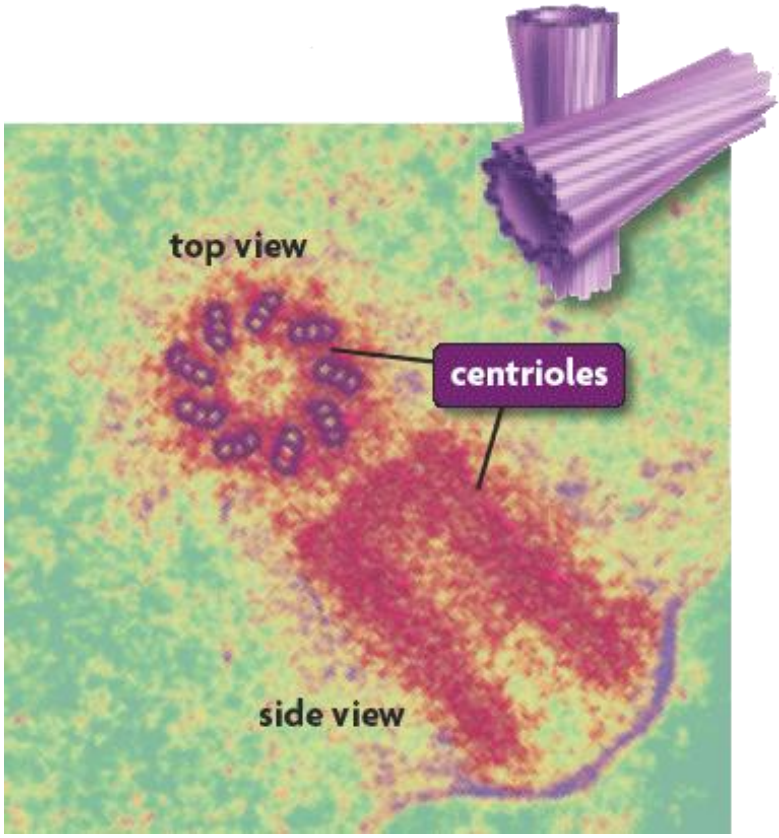
    - provides strength
    - assists in cell division
    - aids in cell movement



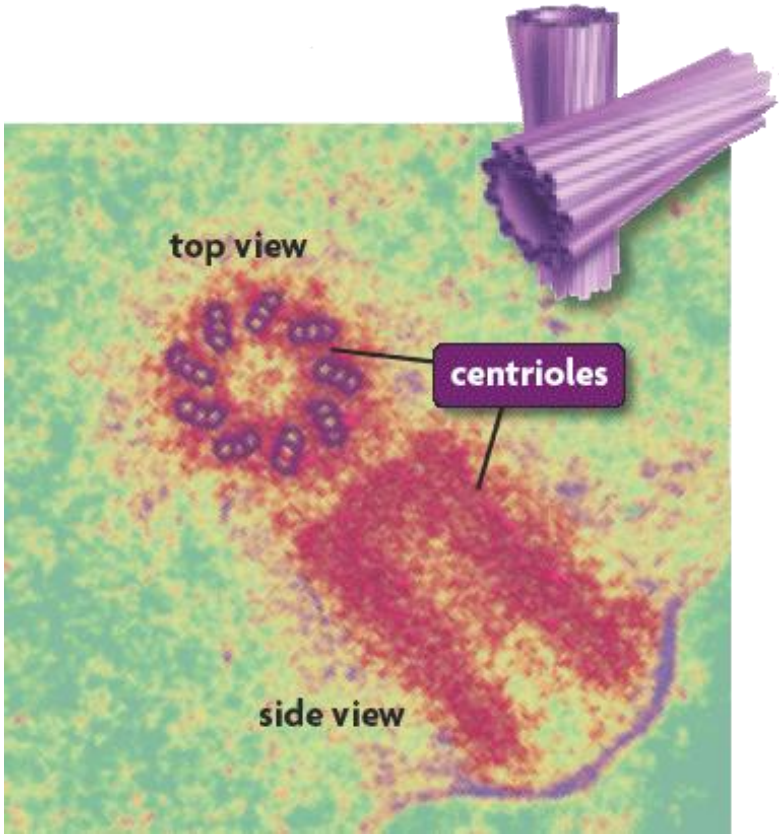
- **Several organelles are involved in making and processing proteins. (continued)**
  - Ribosomes link amino acids to form proteins.
  - Vesicles are membrane-bound sacs that hold materials. They are used to transport materials in the cell.



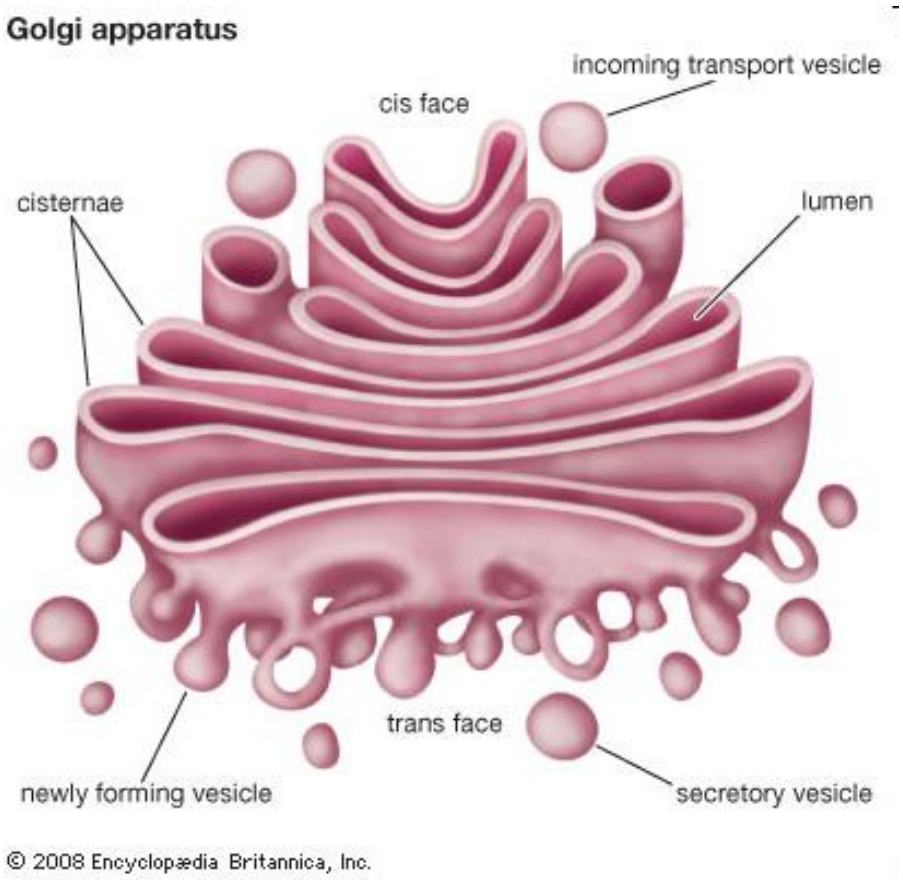
- **Other organelles have various functions.**
  - Centrioles are tubes found in the centrosomes.



- **Other organelles have various functions.**
  - Centrioles are tubes found in the centrosomes.
    - Centrioles help divide DNA.



The **Golgi apparatus** is a part of the membrane system within the cell as well and works closely with the endoplasmic reticulum.



The **Golgi Apparatus** modifies proteins and brings them to the cell surface where they can be secreted in the form of hormones, enzymes, antibodies and other molecules.