

# 7.3- Structures and Organelles

# Comparing the Cell to a Factory

–The parts of a cell work together

–A cells job is to

- Make proteins
- Maintain itself
- Make more cells

Structures in cells are called  
**organelles**

– “little organs”

- **Plasma Membrane**

- like “skin” around the cell
- controls what enters and leaves the cell

- **Cytoplasm**

- The semifluid environment inside the plasma membrane

In prokaryotes, all chemical processes take place here

# • Cell Wall

thick mesh of fiber surrounding  
plant cells

- Protects and gives structure

- made from a carbohydrate called  
**cellulose**

- **Nucleus**

- Contains (most of the) DNA

- DNA is instructions for how to build proteins

- surrounded by a double membrane  
called a **nuclear envelope**

DNA inside of the nucleus is called **chromatin** or **chromosomes** (depending on it's shape)

- **Nucleolus**

- Where ribosomes are made, inside the nucleus



- **Ribosomes**

- Small particles of protein/RNA

- “Read” DNA and link amino acids in the correct order to build proteins

- Free, or attached to the E.R.

- **Rough Endoplasmic Reticulum (RER)**

- A series of internal membranes

- “Rough” because it has ribosomes on it

- Where the ribosomes build proteins (protein synthesis)

- **Smooth Endoplasmic Reticulum (SER)**

- Internal membrane system

- “Smooth” because it has no ribosomes (and therefore doesn't make proteins)

- Builds membrane lipids (lipid synthesis)

- **Golgi Apparatus**
  - Internal membrane system
  - Modifies, sorts, packages proteins for their final destination
  - Puts them into **vesicles**

- **Lysosomes**

- The clean-up crew

- Enzyme filled organelles that digest/recycle old organelles

- **Vacuoles**

- Storage of water, salts, proteins, carbohydrates

- 1 large one in plant cells-helps with plant support

- **Mitochondria**

- “The Powerhouse”

- Convert chemical energy in food (carbohydrates) into a form of energy that cells can use

- Cool Fact: mitochondria have their own DNA, all your mitochondria were inherited from your mother

- **Chloroplasts**

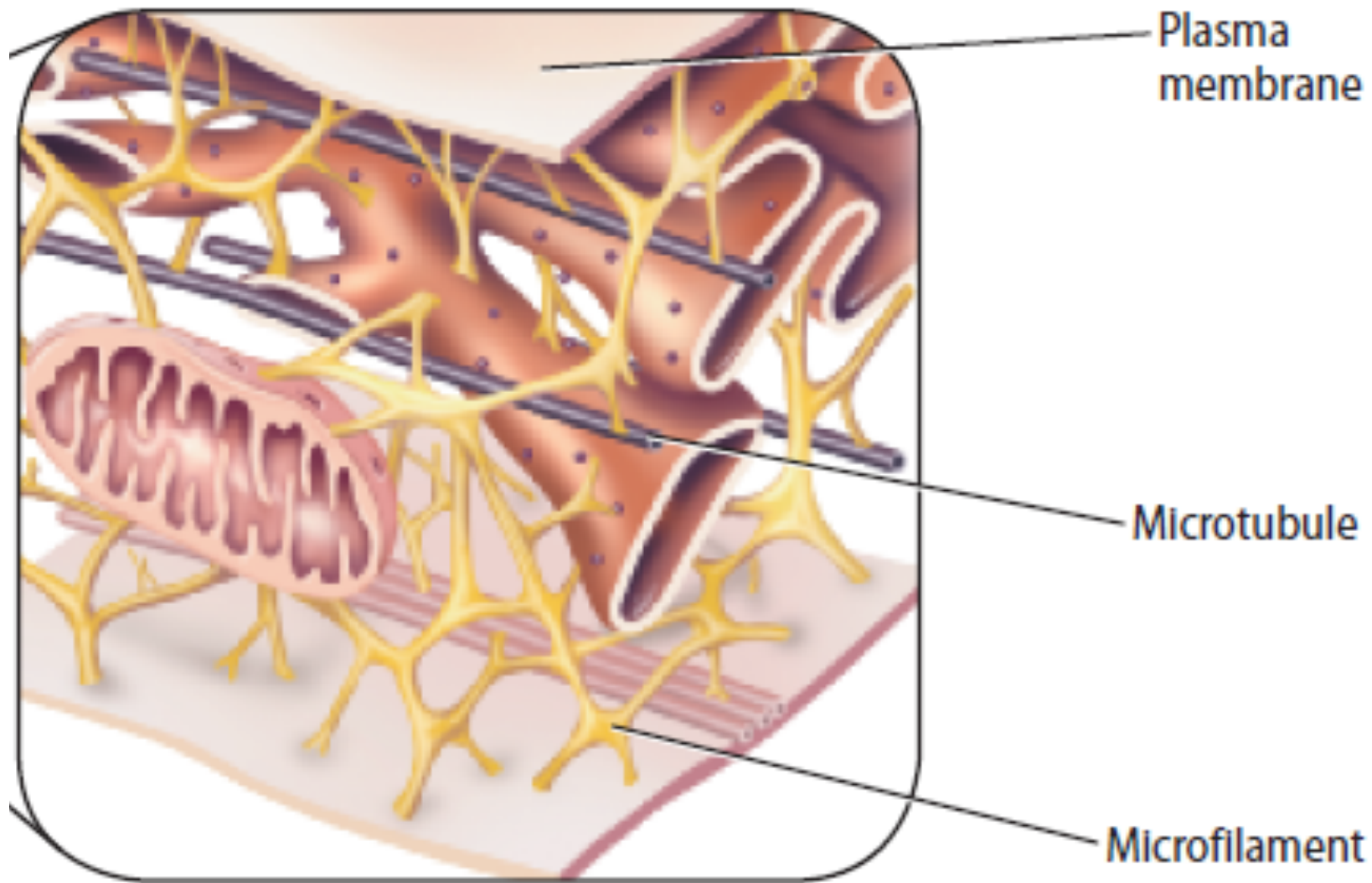
- Found in plants only – plants are solar powered!

- Capture energy from the sun and convert it into carbohydrates



# • Centrioles

- organelles made of microtubules that are used during cell division



**Cytoskeleton**

- **Cytoskeleton**

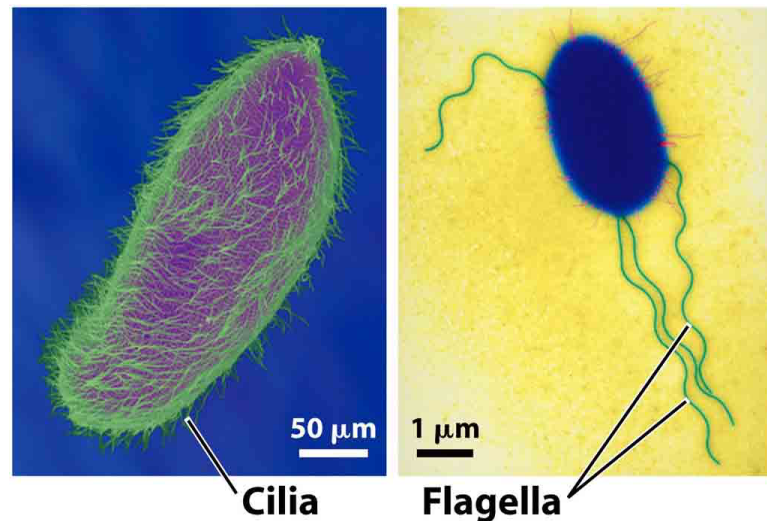
- Helps a cell hold its shape

- **Microtubules** help move substances within a cell

- **Microfilaments** function in cell movement

- Cilia

- Flagella



# **Organelles at Work**

Understanding organelles allows for an understanding of cellular processes.

# **Protein synthesis:**

Begins in the nucleus with information in DNA

RNA and ribosomes leave the nucleus and produce a protein on the E.R.

Proteins produced in the ER are sent to Golgi apparatus for packaging.

Packaged proteins are delivered to other organelles where they serve a variety of functions.

