

The background is a vibrant blue with a low-poly, geometric pattern. In the top right corner, there is a large, bright yellow sun. To its left are stylized white clouds. A light blue pen with a silver clip is positioned diagonally across the upper middle of the image. Below the pen, there is a dark blue, rounded rectangular banner that contains the text 'Ch. 2 Cells' in white. The overall design is clean and modern, typical of a presentation slide.

Ch. 2 Cells



Vocabulary

- Organelles: structures that perform specific functions within the cell
- Endoplasmic Reticulum: network of folded membranes that serves as the cell's transportation system. Helps make proteins and other substances for the cell
- Ribosome: a structure in the endoplasmic reticulum that begins the process of making proteins
- Mitochondria: convert the chemical energy of food into a form the cell can use



Vocabulary

- Diffusion: The movement of a substance from an area of high concentration to an area of lower concentration
- Osmosis: The diffusion of water across the cell membrane
- Mitosis: the process in which a cell nucleus divides
- DNA: a material in a cell's nucleus that stores coded information about how an organism will grow and develop
- Chromosome: coiled structure in a cell nucleus that carries information controlling the cell's activities



Ch. 2.1 What is a cell?



Jobs of Cells

- A cell is the smallest unit that can carry out the activities of life
- Some organisms are made of only 1 cell, they are called single-celled organisms and most can only be seen under a microscope
- Larger organisms are made of multiple cells and are called multicellular organisms. In these organisms different cells perform different tasks



Jobs of Cells

- All cells must perform the same tasks to stay alive
- They must obtain nutrients and energy, remove waste products, grow and reproduce
- Each part of the cell performs a different task
- Paramecium have hairlike structures to help it swim
- Skin cells specialize in protection



Using Microscopes to See Cells

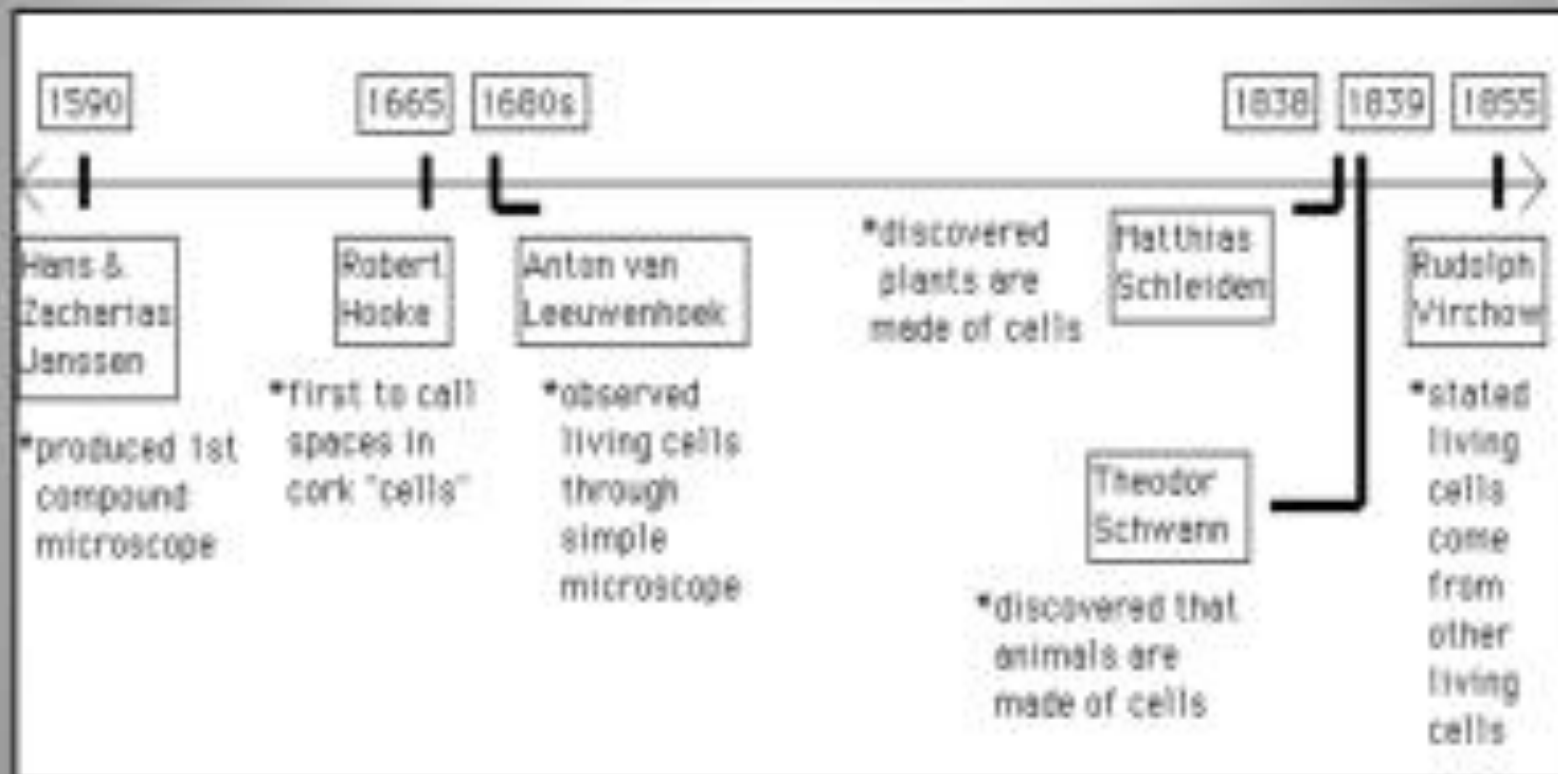
- The first person to describe cells was Robert Hooke
- He used a hand-made microscope to look at layers of cork
- Saw tiny rectangular “rooms” which he called cells
- At the same time Anton van Leeuwenhoek used his own microscope to study pond water
- He observed single-celled organisms and called them “very little animalcules”



The Cell Theory

- In 1838 Mathias Schleiden concluded all plants are made of cells
- The following year Theodore Schwann said all animals are made of cells
- In 1855 Rudolf Virchow stated all new cells come from already existing cells

The Cell Theory Timeline





Ch. 2.2 What are the functions of organelles?

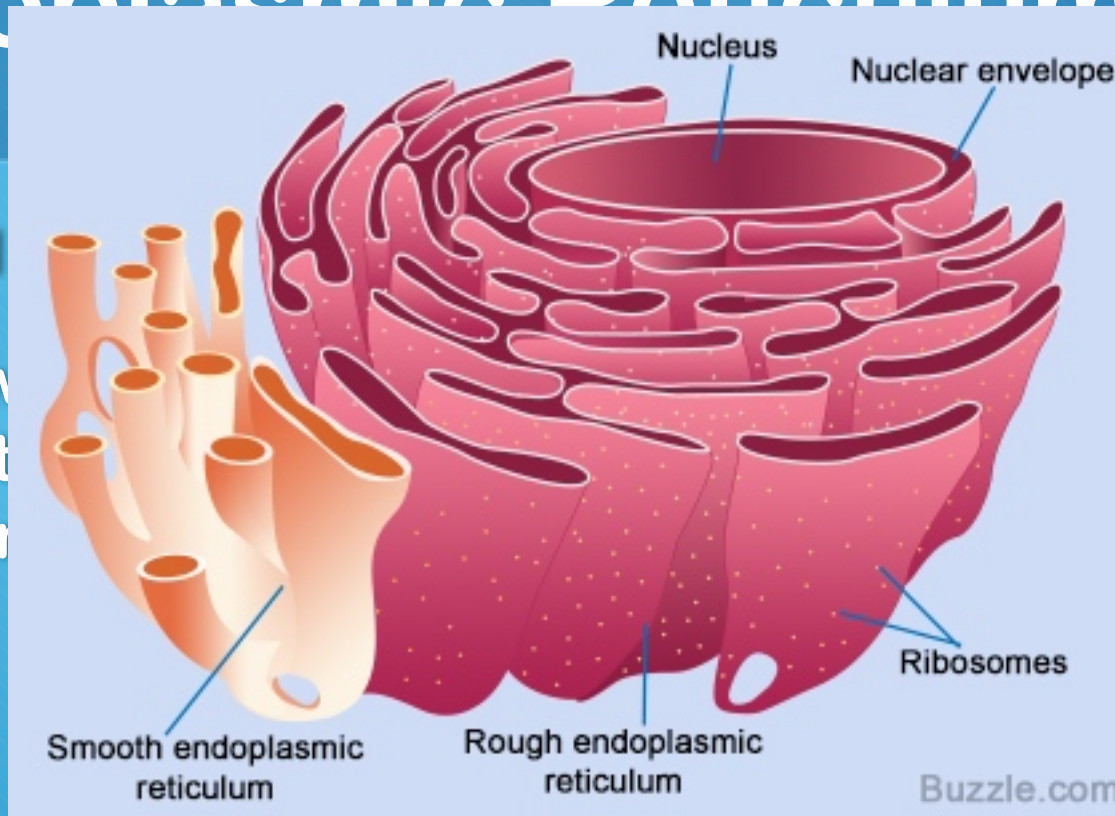


The Organelles

- All cells consist of organelles that perform different functions
- In multicellular organisms, the cells perform different rolls
- Plant and animal cells have some different organelles

Endoplasmic Reticulum

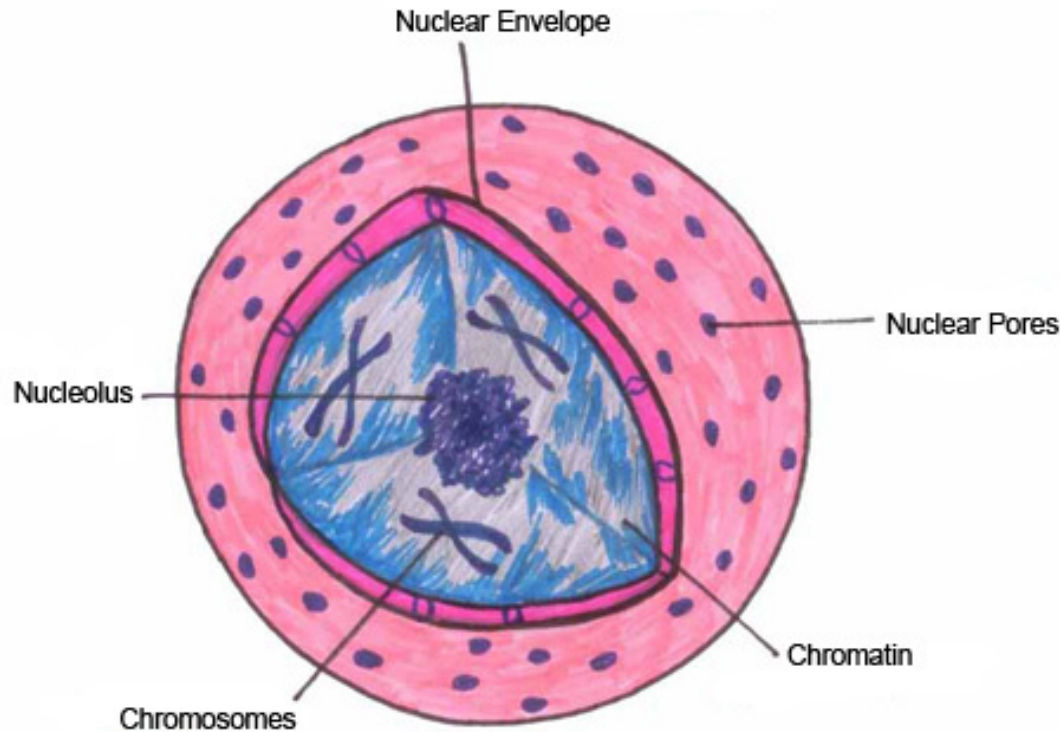
- Found
- A network of membranes that make up the cell's transport system for proteins and lipids



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make
the

Nucle

- Found in
- Directs the
instruction
passed a



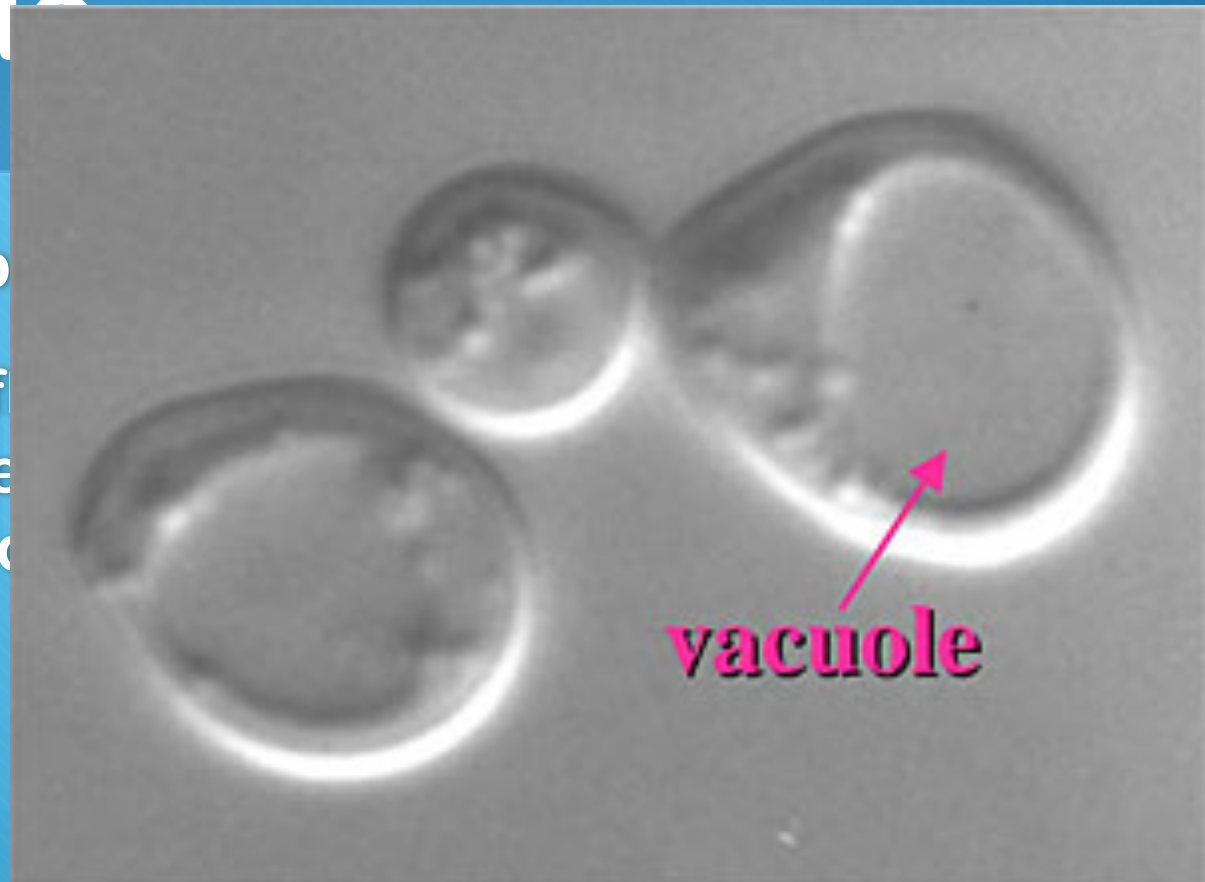
Cell Nucleus Diagram

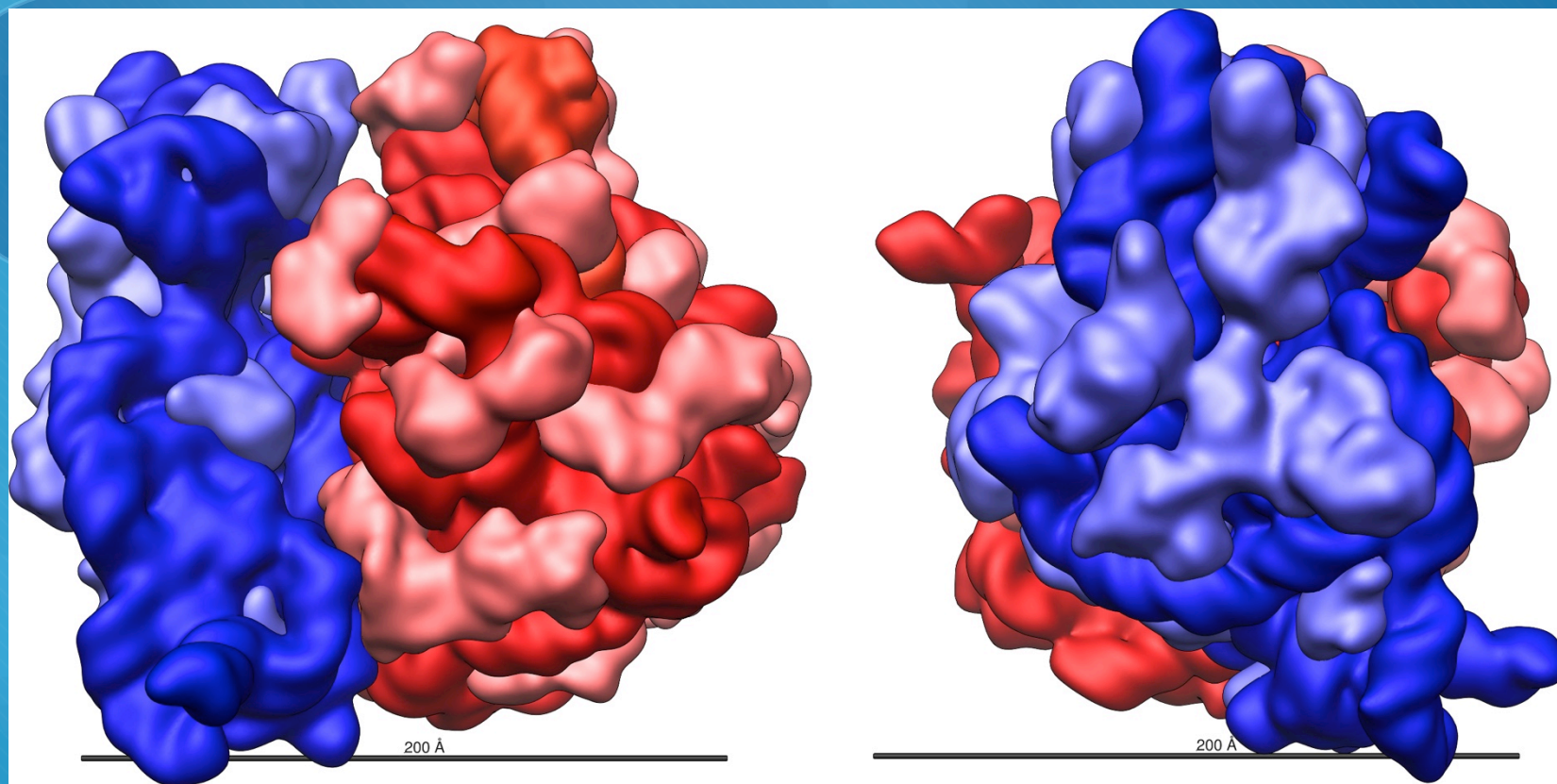
Sketch by Saptakee Sengupta

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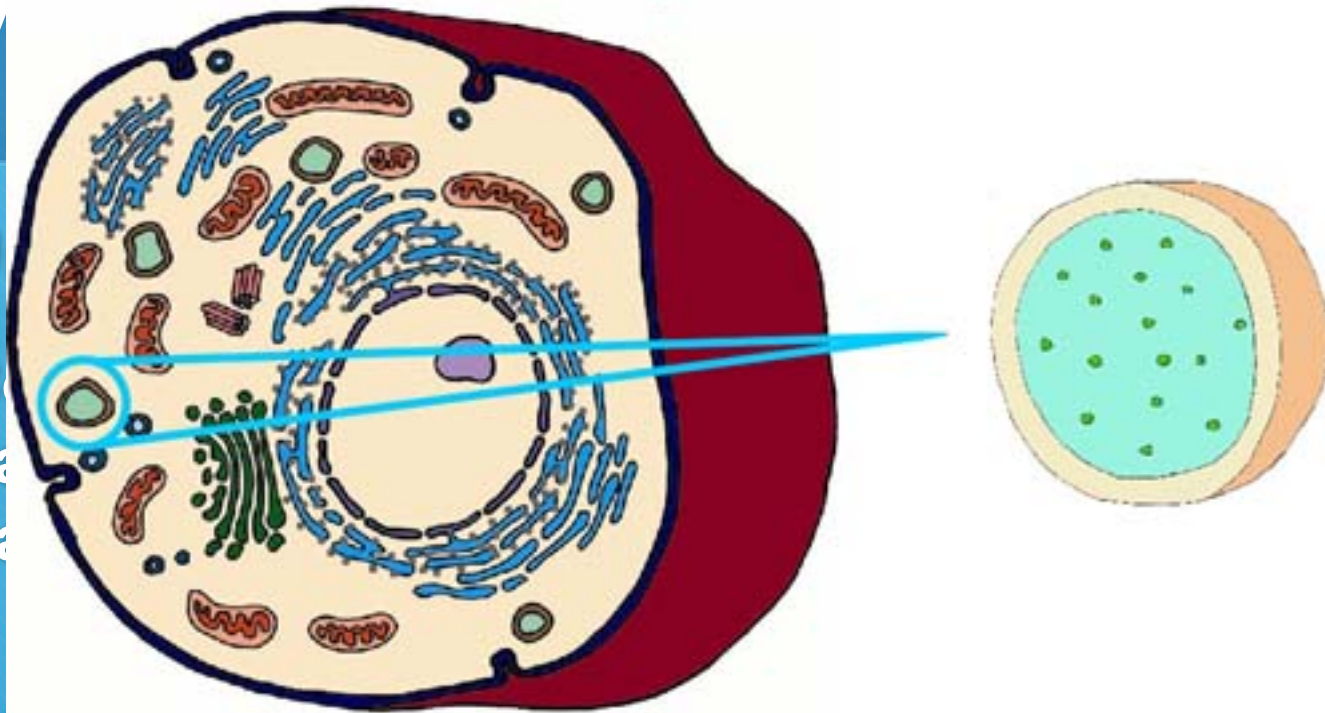
Vacuole

- Found in p
- Contains f
membrane
digest food





Lysosome



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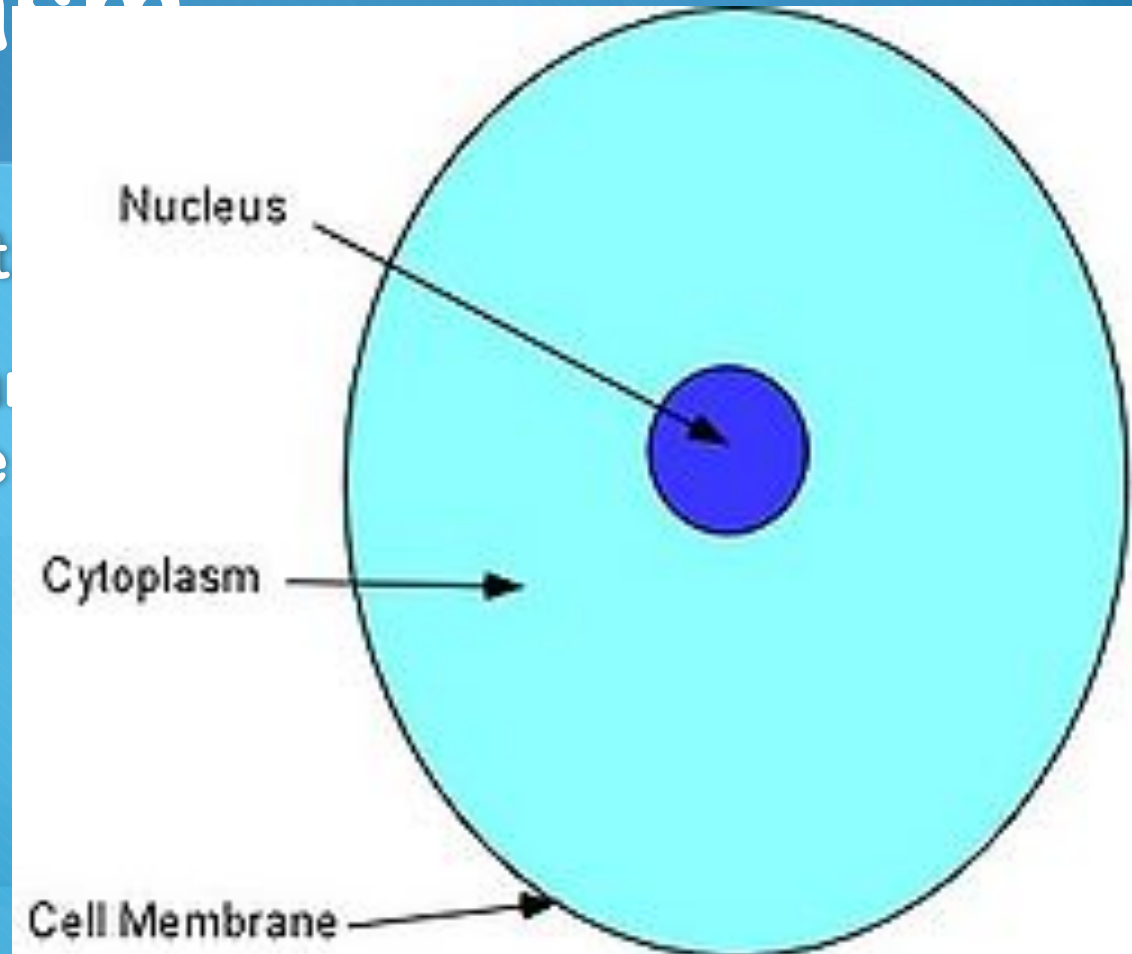
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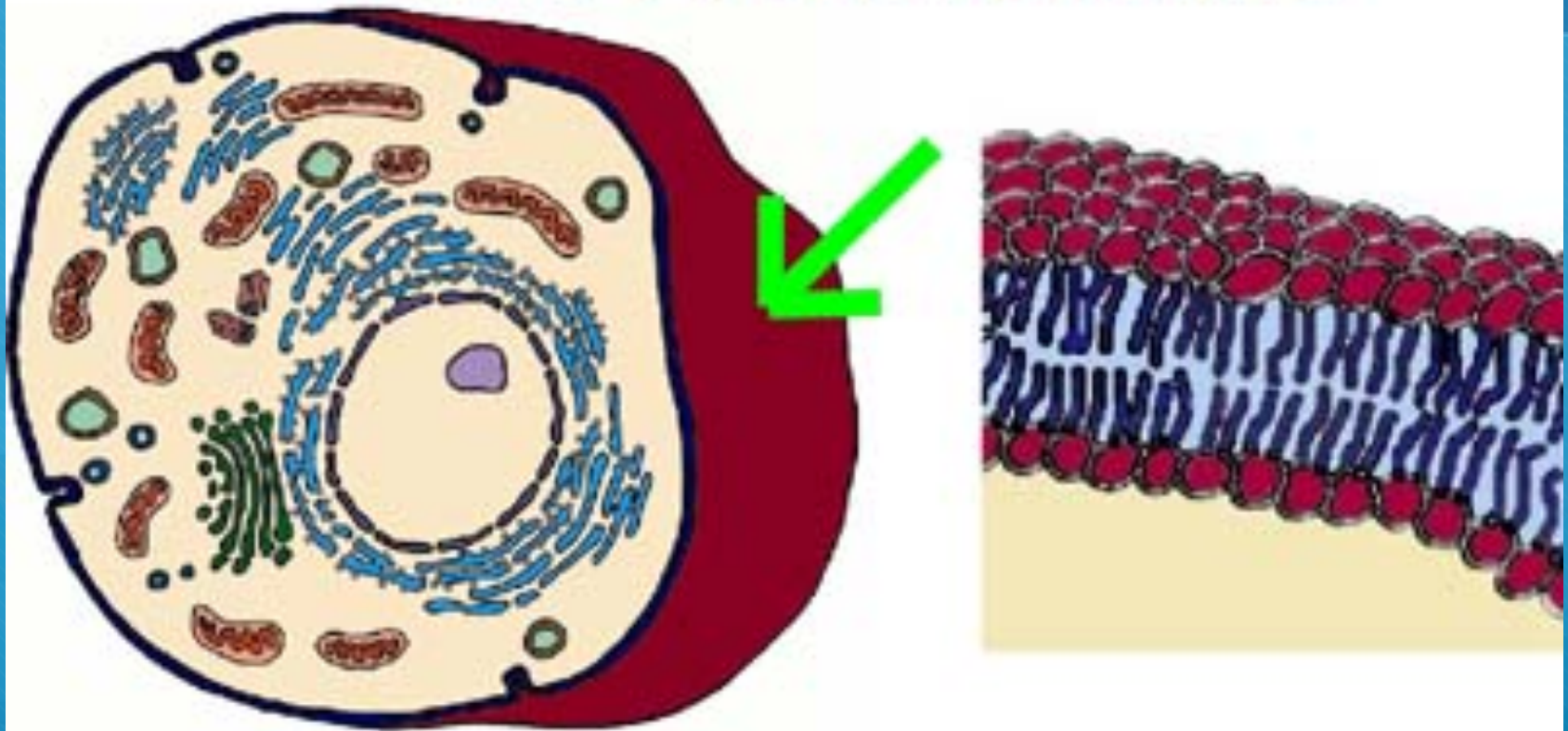
Cytoplasm

- Found in both
- Fluid substance between the

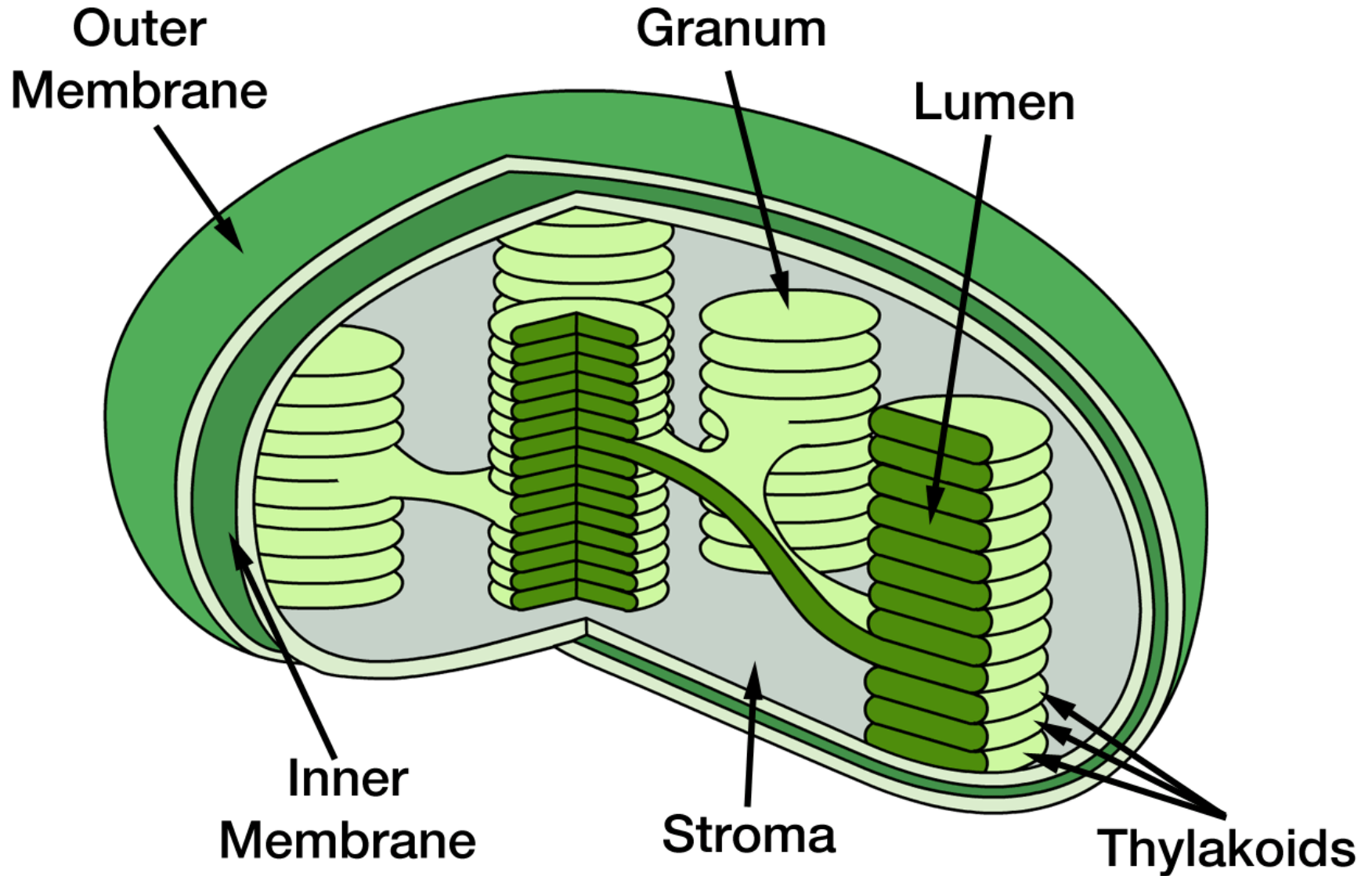


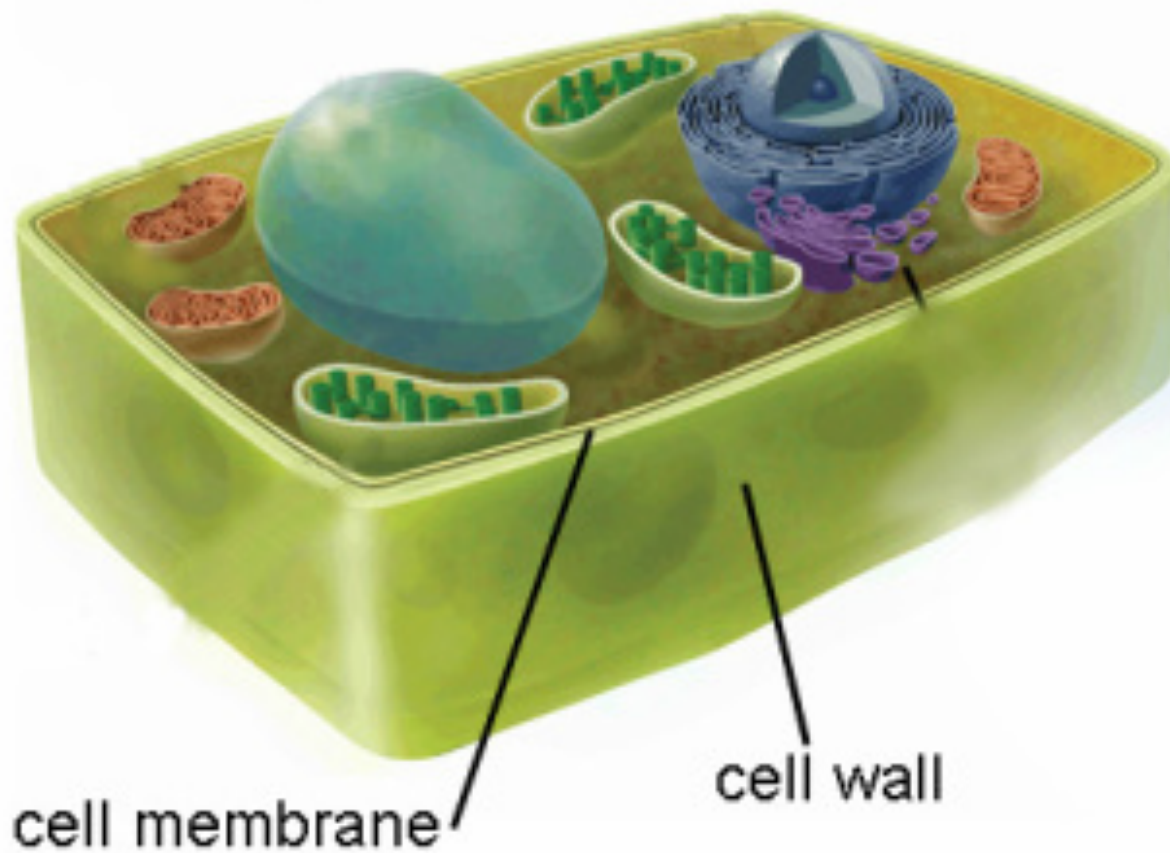
Cell Membrane

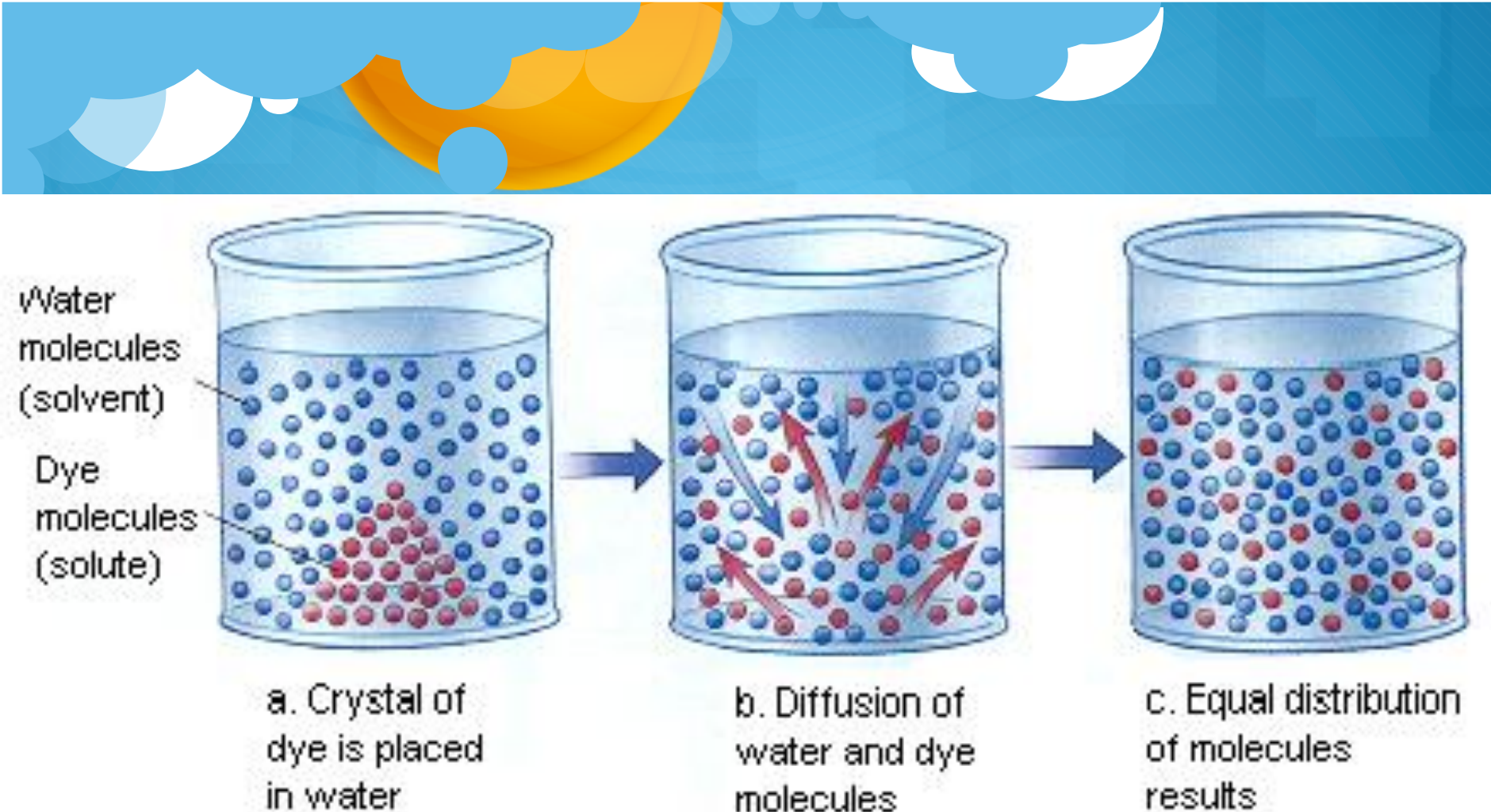
Cell Membrane



Chloroplast







- When dye crystals are placed in water, they are concentrated in one area
- The dye dissolves in the water, and a net movement of dye molecules occurs. A net movement of water molecules occurs in the opposite direction.
- Eventually, the water and the dye molecules are equally distributed throughout the container.



The Cell Membrane

- Controls the environment inside the cell
- Only some substances can pass through by diffusion
- Small particles found in water, oxygen and carbon dioxide can pass through. Larger particles like salts and proteins cannot



Diffusion of Water

- Diffusion of water across the cell membrane is called osmosis
- In plant cells when there is not enough water, the pressure on the cell wall is reduced and the plant wilts
- In an animal cell, too much water can cause the cell to burst



CH. 2.3 How Do Cells Grow and Divide



Cell Size and Growth

- Why are cells so small?
- Materials need to move throughout the cell and from organelle to organelle
- If cells were larger it would take longer for materials to move in and wastes out. This longer process could lead to the cell dying

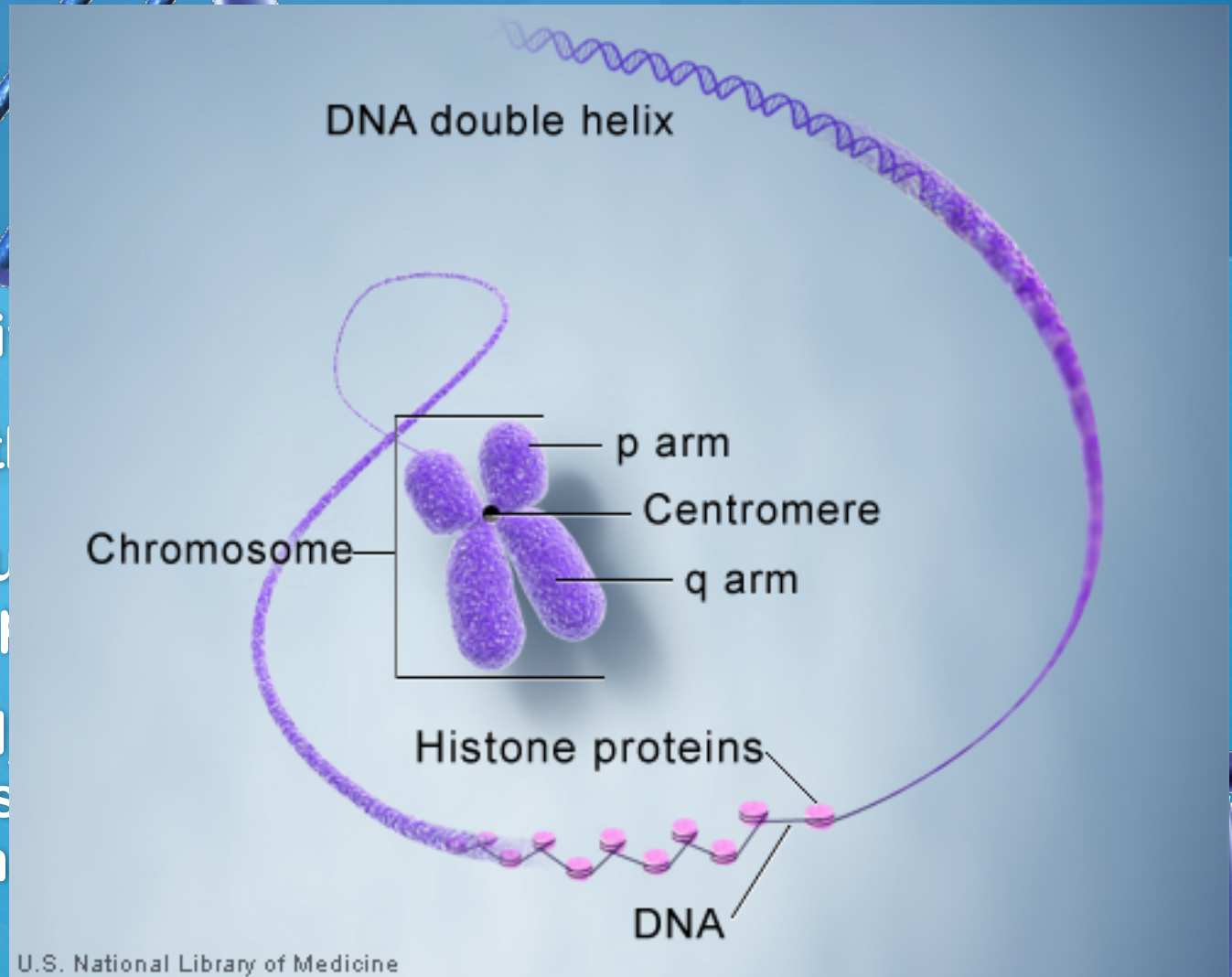


Cell Division

- As cells grow too large they divide into two new cells
- Each new cell is a copy of the old cell
- As cells divide the organism grows larger

Cell

- Cell division
- Here to
- The nucleus makes proteins
- Usually begins chromosome





Mitosis

- Every species has a specific number of chromosomes which are found in pairs
- Chromosomes contain a cell's operating instructions
- Mitosis ensures that each new cell gets the right number of chromosomes
- Each nucleus in the resulting cells will receive a complete set of chromosomes
- Mitosis is described in stages but is a smooth continuous process.
- When complete the cell cytoplasm divides

FIGURE 12

The Cell Cycle

Cells undergo an orderly sequence of events as they grow and divide. The sequence shown here is a typical cell cycle in an animal cell.

Comparing and Contrasting Compare the location of the chromosomes during metaphase and anaphase.

