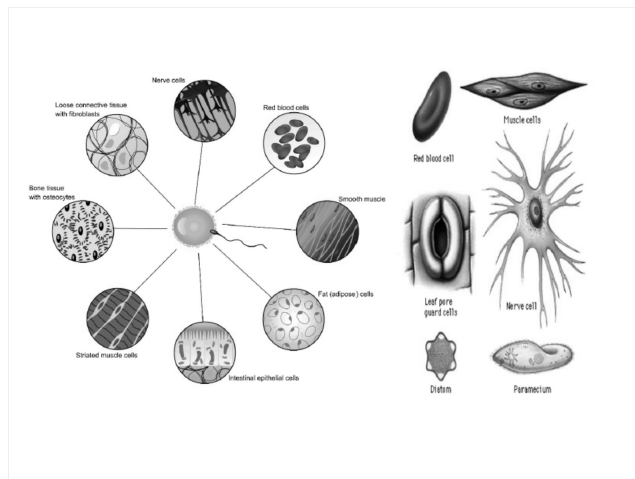


Cell Specialization

All cells start out as a stem cell. This means that all cells in an organism have the same DNA! In some cells only certain pieces of DNA (genes) work. A stem cell (unspecialized) can become any other type of specialized cell (ex: heart cell).

- When a stem cell divides it can differentiate (become structurally different) into another type of cell.
- Once a cell becomes structurally different it can become specialized at doing a certain job.
Ex: Red blood cells transport oxygen.

Question: Can unicellular organisms be specialized?



Red Blood Cells (RBC)

Specialization: Carry oxygen through the blood.

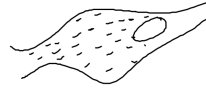
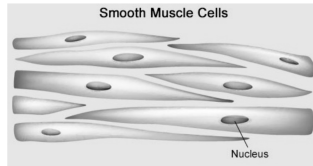
Differentiation: Contain the protein hemoglobin and have a bowl shape to increase surface area to carry more oxygen. No nucleus since they do not divide.



Muscle Cells

Specialization: Contract to pull and release bones for movement.

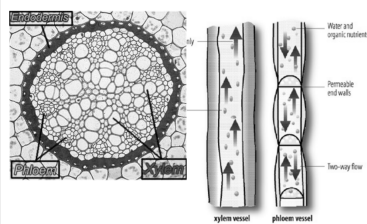
Differentiation: Have lots of mitochondria to produce lots of energy (ATP).



Xylem and Phloem Cells

Specialization: Carry food (phloem) and water (xylem) through a plant.

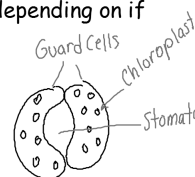
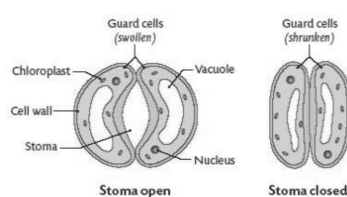
Differentiation: Composed of narrow tubular cells.



Guard Cells/Stomata

Specialization: Gas exchange in plants (CO_2 in and O_2 out)

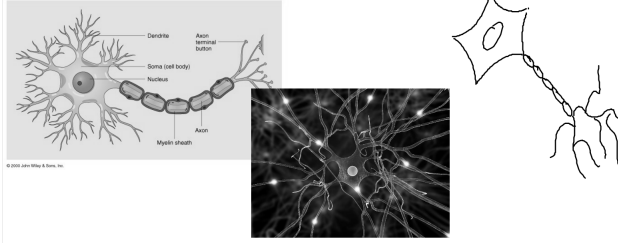
Differentiation: Have chloroplast that detect light and can open and close depending on if there is light.



Nerve Cells

Specialization: Conduct electrical impulses for communication.

Differentiation: Have a high concentration of salt to conduct electrical impulses. Long and thin to cover greater distance.



Levels Of Organization

