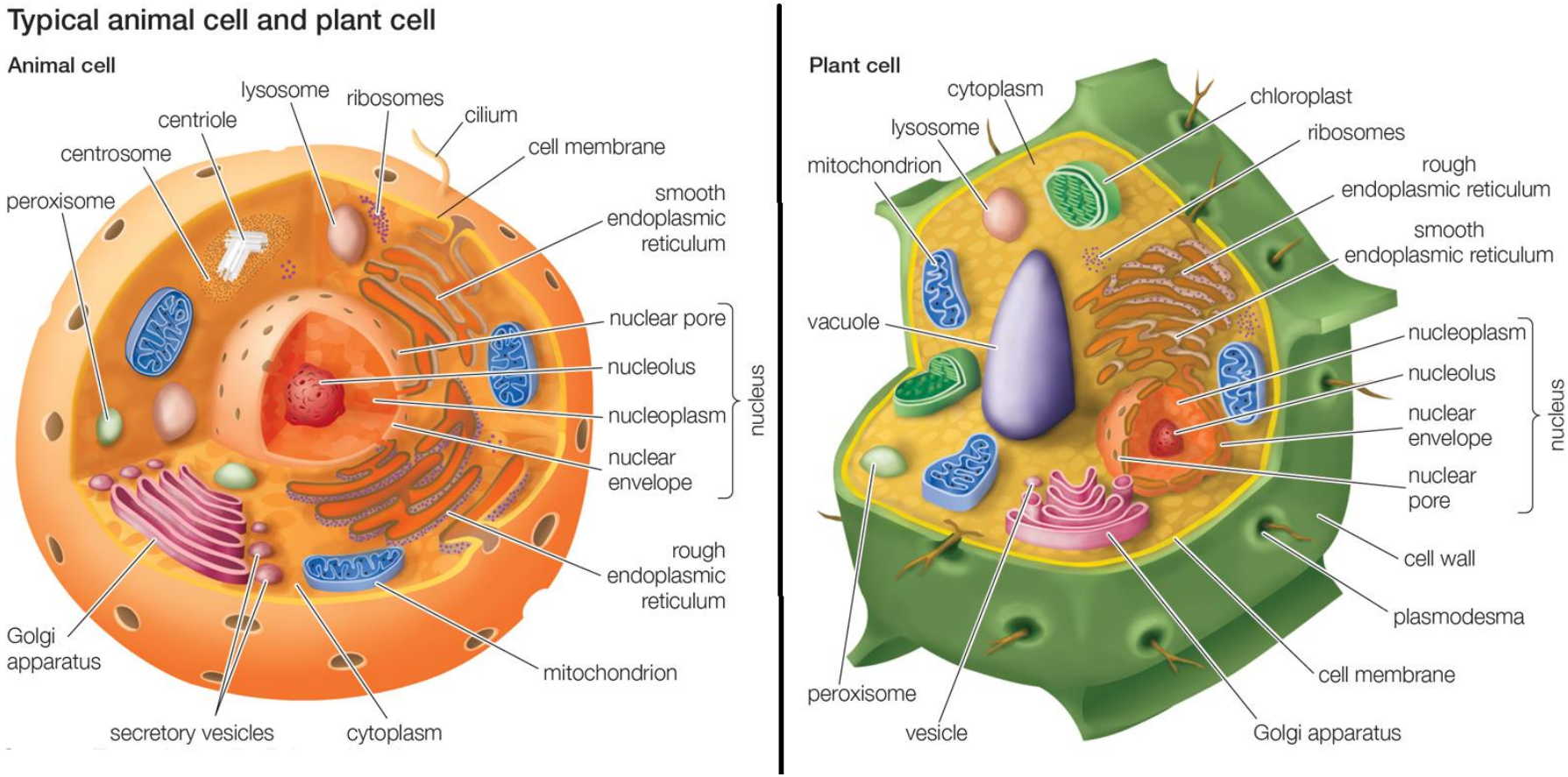
Differences between Animal Cells and Plant Cells

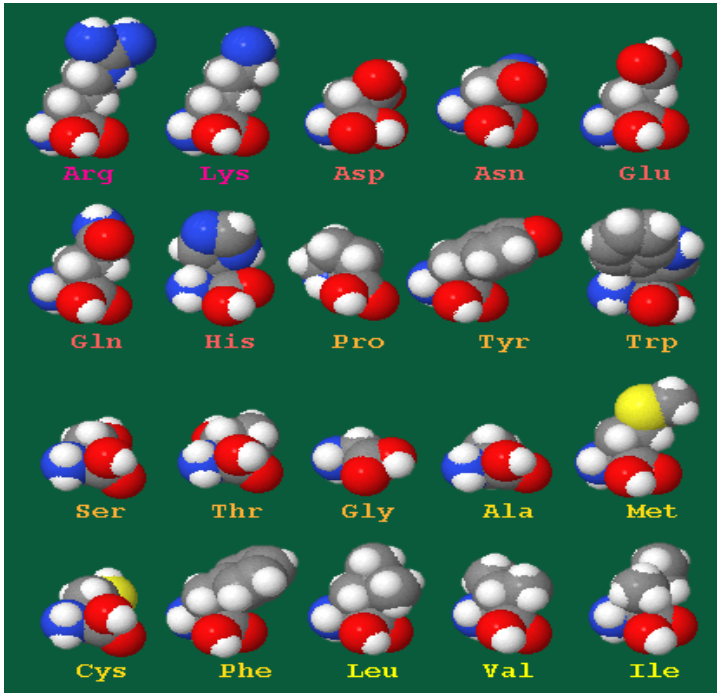


1. **Size:** Animal cells are generally smaller than plant cells. Animal cells range from 10 to 30 micrometers in length, while plant cells range from 10 and 100 micrometers in length.

2. **Shape:** Animal cells come in various sizes and tend to have round or irregular shapes. Plant cells are more similar in size and are typically rectangular or cube shaped.

3. **Energy Storage:** Animals cells store energy in the form of the complex carbohydrate glycogen. Plant cells store energy as starch.

4. **Proteins:** 20 amino acids needed to produce proteins, only 10 can be produced naturally in animal cells. The other so-called essential amino acids must be acquired through diet. Plants are capable of synthesizing all 20 amino acids.

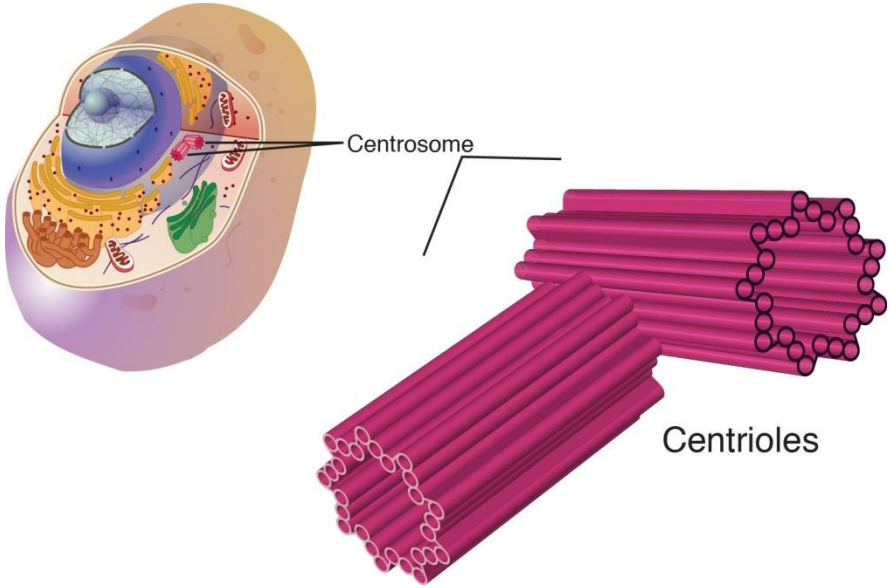


5. **Differentiation:** In animal cells, only stem cells are capable of converting to other cell types. Most plant cell types are capable of differentiation.

6. **Growth:** Animal cells increase in size by increasing in cell numbers. Plant cells mainly increase cell size by becoming larger. They grow by absorbing more water into the central vacuole.

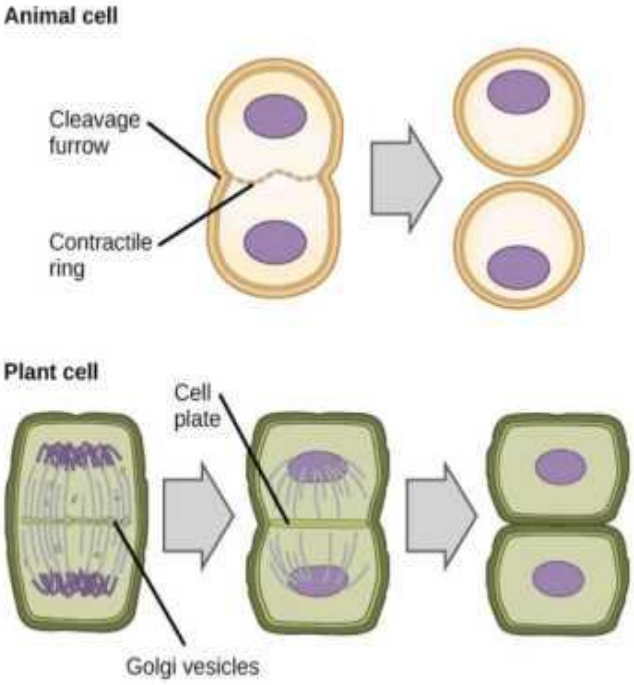
7. **Cell Wall:** Animal cells do not have a cell wall but have a cell membrane. Plant cells have a cell wall composed of cellulose as well as a cell membrane.

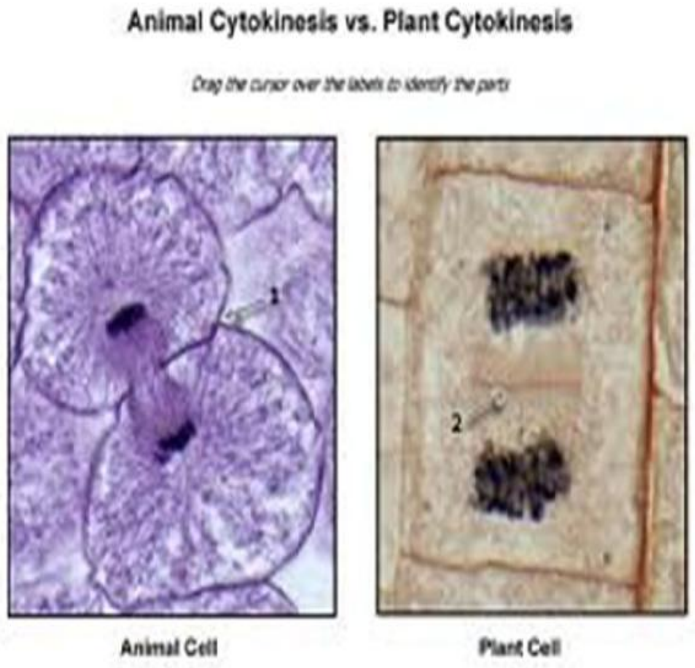
8. **Centrioles:** Animal cells contain these cylindrical structures that organize the assembly of microtubules during cell division. Plant cells do not typically contain centrioles.



9. **Cilia:** Cilia are found in animal cells but not usually in plant cells. Cilia are microtubules that aid in cellular locomotion.

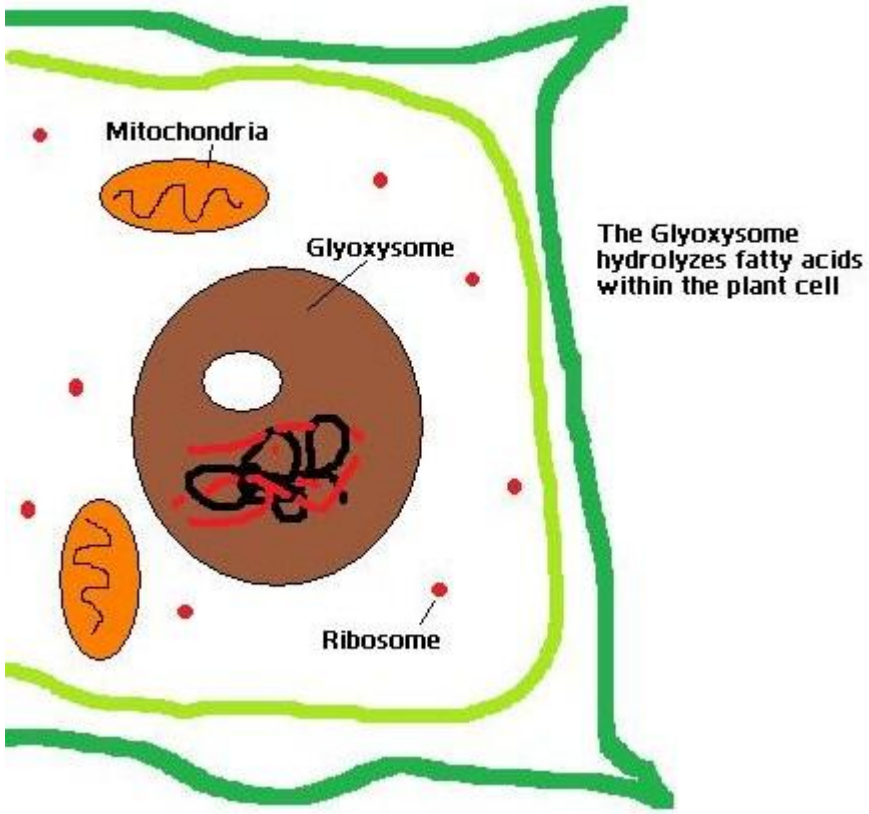
10. **Cytokinesis:** Cytokinesis, the division of the cytoplasm during cell division, occurs in animal cells when a cleavage furrow forms that pinches the cell membrane in half. In plant cell cytokinesis, a cell plate is constructed that divides the cell.

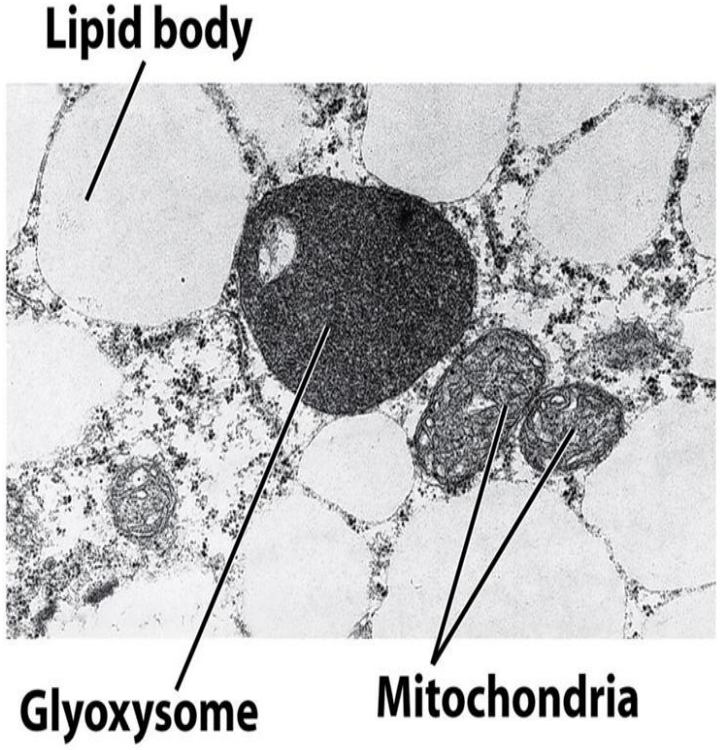




Cytokinesis in microscope

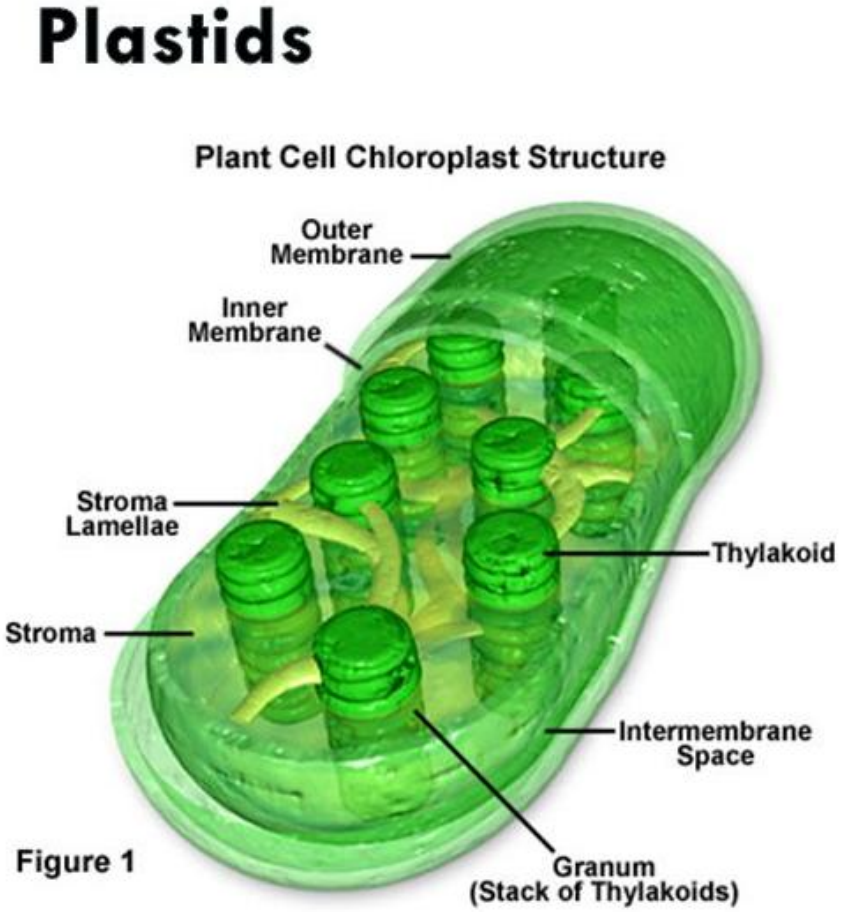
11. **Glyoxysomes:** These structures are not found in animal cells, but are present in plant cells. Glyoxysomes help to degrade lipids, particularly in germinating seeds, for the production of sugar.



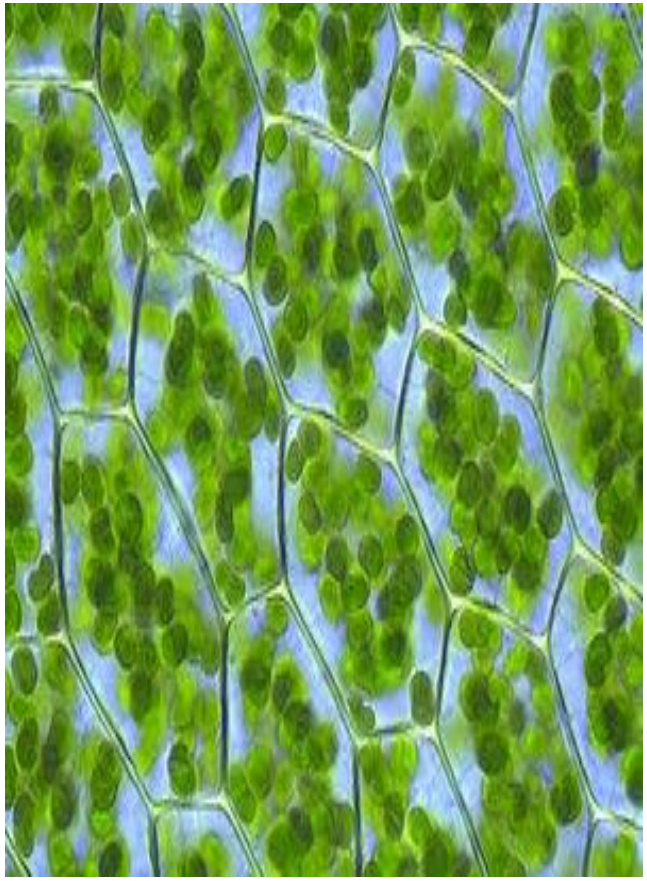


12. **Lysosomes:** Animal cells possess lysosomes which contain enzymes that digest cellular macromolecules. Plant cells rarely contain lysosomes as the plant vacuole handles molecule degradation.

13.**Plastids:** Animal cells do not have plastids. Plant cells contain plastids such as chloroplasts, which are needed for photosynthesis.

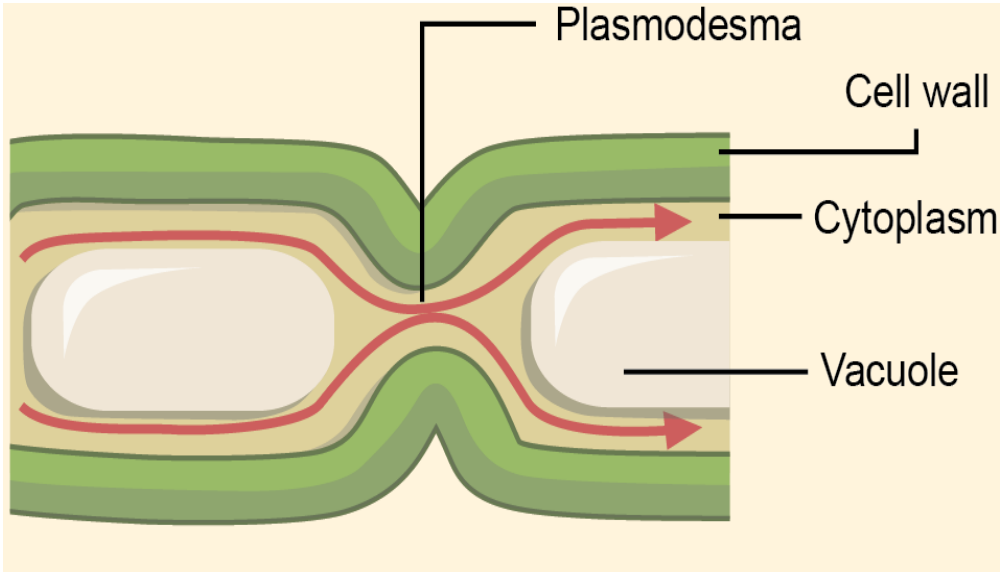


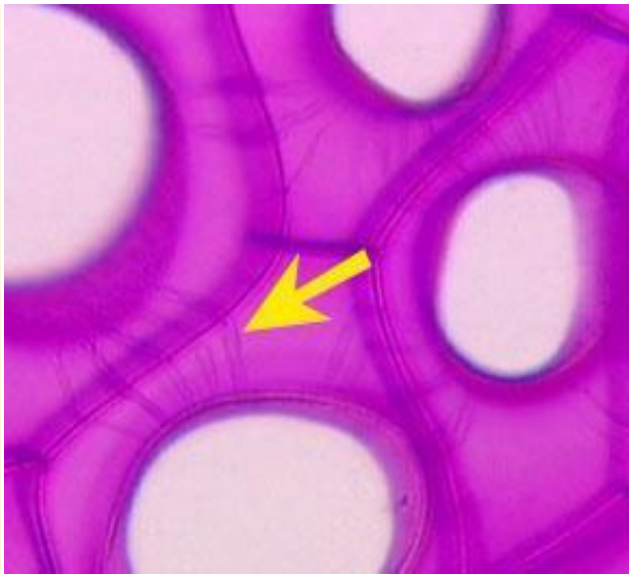
Plastid structure



plastid in microscope

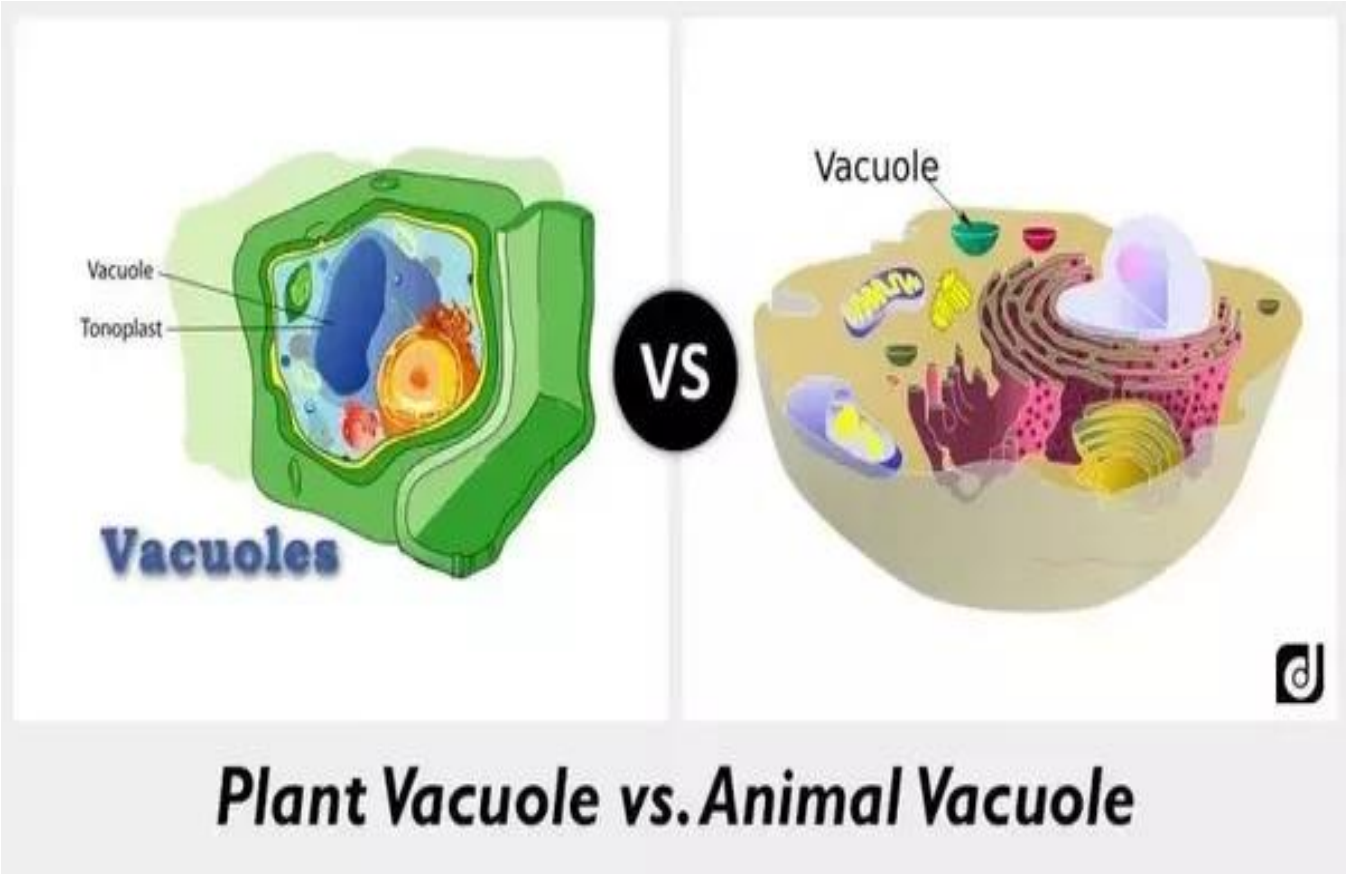
14. **Plasmodesmata:** Animal cells do not have plasmodesmata. Plant cells have plasmodesmata, which are pores between plant cell walls that allow molecules and communication signals to pass between individual plant cells.





Plasmodesmata in microscope

15-Vacuole: Animal cells may have many small vacuoles. Plant cells have a large central vacuole that can occupy up to 90% of the cell's volume.



Differences between animal and plant cell

No	Organs	Animal Cell	Plant Cell
1.	**Cell wall**	Absent	Present (formed of cellulose)
2.	**Shape**	Round (irregular shape)	Rectangular (fixed shape)
3.	**Vacuole**	One or more small vacuoles (much smaller than plant cells).	One, large central vacuole taking up 90% of cell volume.
4.	**Centrioles**	Present in all animal cells	Only present in lower plant forms.
5.	**Chloroplast**	Animal cells don't have chloroplasts.	Plant cells have chloroplasts because they make their own food.
6.	**Cytoplasm**	Present	Present
7.	**Ribosomes**	Present	Present
8.	**Mitochondria**	Present	Present
9.	**Plastids**	Absent	Present

No	Organs	Animal Cell	Plant Cell
10.	**Endoplasmic Reticulum (Smooth and Rough)**	Present	Present
11.	**Golgi Apparatus**	Present	Present
12.	**Plasma Membrane**	Only cell membrane	Cell wall and a cell membrane
13.	**Microtubules/ Microfilaments**	Present	Present
14.	**Flagella**	May be found in some cells	May be found in some cells
15.	**Lysosomes**	Lysosomes occur in cytoplasm.	Lysosomes usually not evident.
16.	**Nucleus**	Present	Present
17.	**Cilia**	Present	Most plant cells do not contain cilia.