# Organelle of the Day-Chloroplast

Today we are going to use a freshwater plant to study chloroplasts. The plant is commonly called Elodea but it is also known as Anacharis. Elodea is often used in fish tanks to provide oxygen, food and shelter for fish and other aquatic animals. Elodea lives entirely underwater with the exception of small white flowers that appear at the surface. These flowers are attached to the underwater plant by thin stalks. Elodea produces buds from the stem tips that can over winter on the lake bottom. In the fall leafy stalks will detach from the parent plant, float away, root, and start new plants. This is Elodea's most reliable method of spreading, with seed production playing a relatively minor role. Its ability to spread has earned it yet another name: waterweed! In many states Elodea is classified as an invasive species.

The cells of this plant are green because they contain numerous green organelles called chloroplasts. Chloroplasts are found only in plants and other photosynthetic organisms.

Read about chloroplasts in your textbook and answer the following questions.

1. What substance gives the chloroplast their green color? _____
2. What other cellular structure is found in plant cells but not in animal cells? _____
3. What does chlorophyll do? _____
4. True or False - Chloroplasts have two membranes.

Carefully follow the procedure below

1. Get a clean slide and cover slip.
2. Place one drop of water on the center of the slide.
3. Get a single leaf of elodea from your teacher.
4. Gently place the elodea leaf on top of the water drop.
5. Gently place the cover slip on top of the slide. Follow the technique demonstrated by your teacher to minimize the number of air bubbles. (Using forceps hold the cover slip at an angle as you lower it onto the slide.)

6. Place the slide on the stage, and bring it into focus under the low power objective.
7. Swing the high power objective around and bring the cells into focus. REMEMBER!! DO NOT USE THE COARSE ADJUSTMENT!! ONLY USE THE FINE ADJUSTMENT TO FOCUS UNDER HIGH POWER.
8. Make a drawing of two cells under the microscope in the space provided. Label the chloroplast and the cell wall. Use a ruler to draw your lines!

**Elodea Cells**

Magnification _____

9. Elodea cells average about .3 mm long. Measure one of the cells on your drawing (in millimeters) and divide by 0.3 mm. This will tell you how much you have magnified the actual elodea cell in your drawing. Write this at the bottom of your drawing.
10. Compare and contrast the elodea cells to the cheek cells. What do you see that is different? What do you see that is the same?
    a._____
    b._____
    c._____

11. Look carefully at the Elodea cells and see if you can see the chloroplasts moving. They should look like little green bumper cars

going around a track. This movement is called cyclosis. Suggest a possible reason for this type of movement. (Hint: what could the chloroplasts be "looking" for?)

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12. Let's revisit the idea of hypertonic and hypotonic. The cytoplasm of elodea cells contains dissolved materials and water. When you put the elodea in water on your slide the concentration of water molecules is greater outside than inside. So water moves _____ the leaf. Now if we add a drop of salt water the concentration of water is greater inside the leaf rather than inside the leaf. Try this and see what happens. You can gently remove the cover slip and add a drop of salt water and then put the cover slip back on. Describe what happens inside the cells when you do this.

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13. Wash off the microscope slide, dry it thoroughly, and put it in the location that your teacher directs you.
14. Turn off your microscope. Make sure it is on the lowest power, and use a slightly damp paper towel to wipe off the stage of your microscope.