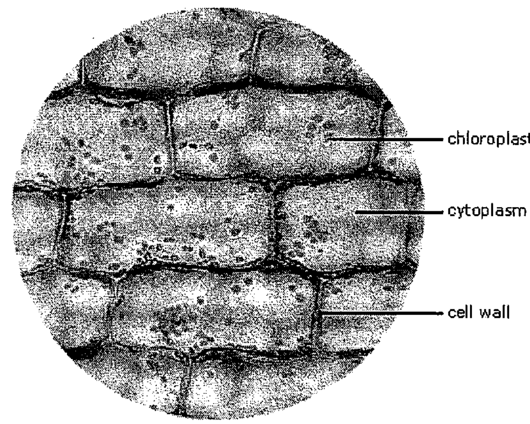
# *ELODEA* Observations Lab

## INTRODUCTION

Elodea is a rooted multi-branched perennial plant that also can survive and grow as floating fragments. The dark green blade-like leaves are in whorls of three with finely toothed margins. Elodea leaves are thin and transparent; most leaves are only 2 cell layers in thickness.

Native to North America, Elodea plants are often more commonly called waterweeds. Elodea is an important part of lake ecosystems. It provides good habitat for many aquatic invertebrates and cover for young fish and amphibians. Waterfowl, especially ducks, as well as beaver and muskrat eat this plant. Also, it is of economic importance as an attractive and easy to keep aquarium plant.

Green plant cells contain special structures called **chloroplasts**, which are cytoplasmic organelles that function in manufacturing/synthesizing plant food (i.e., **glucose**). Chloroplasts are green because they contain the green pigment **chlorophyll**. This pigment has an important job of absorbing **sunlight** energy during a complex chemical process called **photosynthesis**. Photosynthesis entails capturing and transforming the energy of sunlight into **chemical bond energy**. This chemical energy is found in the **chemical bonds** of glucose.




## OBJECTIVE

To make observations about Elodea leaves using a compound light microscope.

## MATERIALS

Compound light microscope, slides, coverslips, Elodea leaf

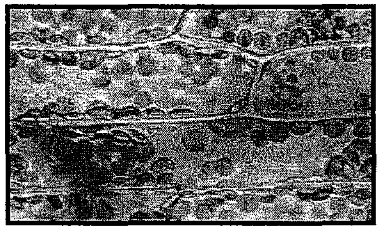
## METHODS and OBSERVATIONS

1. Remove an Elodea leaf from its stem using a pair of forceps. **DO NOT** use your fingers.
2. Place your leaf flat on your glass slide, add one drop of water, and cover with a cover slip. Remember to place the coverslip at an angle to your slide to minimize water bubbles.

Draw four Elodea cells under low power. Label the cell wall, cytoplasm, and chloroplasts.

3. Now focus your specimen under high power. Draw one cell and label the cell wall, cytoplasm, and chloroplasts. Remember that your cell should be 4 times larger than the cells you drew under low power.
4. Determine the size of a single cell (in $\mu m$), assuming that the low power FOV diameter is 1,800 $\mu m$. **Explain how you calculated your answer.**
5. Determine the size of an individual cell, assuming the HIGH power FOV is 450 $\mu m$. Please show all work.

6. Move your fine focus first to the right until the cells come clearly into focus. Then move the fine focus adjustment the opposite way until the cells again come into focus. Describe what you observed.
7. Examine the cells carefully for any occurrence of **cyclosis** (or cytoplasmic streaming). Cyclosis is the movement of the cytoplasm. Try to find cells where the chloroplasts are moving. Describe your observations of cyclosis, including the location and direction of streaming chloroplasts.
8. Remove the wet mount slide from the stage, clean up, and put your microscope away.



**RESULTS and CONCLUSIONS**

1. Why did you use forceps instead of your fingers to remove a leaf from its stem?
2. Describe the general shape of the Elodea cells.
3. What was the general shape of the chloroplasts you observed? Why were they green in color?
4. Explain why some chloroplasts came into view while others became unfocused when you used the fine adjustment under high power.
5. Discuss the role of chloroplasts during photosynthesis.
6. Define the term cyclosis and hypothesize as to why it is important to the survival of cells.
7. Hypothesize as to why chloroplasts moved only along the edges of the Elodea cells.
8. Why do you think it important to have Elodea in a home aquarium that houses fish and other water animals?