NAME _____

DATE _____

Carolina LabSheets™

Observing Plant Cells

In this lab you will observe plant cells. *Elodea* is an aquatic plant often used in aquaria. It has thin leaves that easily fit under a coverslip, making it possible to observe their cells under magnification with little preparation.

Use forceps to remove a leaf from near the growing tip of an *Elodea* plant. Place the leaf on a microscope slide and add 2 drops of water. If you removed multiple leaves, use a dissecting needle to separate them. Then, add a coverslip.

Using the scanning lens (4×) of your microscope, examine the slide and locate the *Elodea* leaf. Switch to the low-power lens (10×). Slowly focus up and down on the leaf. Note that there are layers of cells in the plant leaf.

1. How many layers of cells do you observe?

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Focus on the topmost layer of cells. Select an area that clearly shows numerous cells. Now, switch to the high-power lens (40×). Refocus as necessary to obtain a clear view of the cells.

Notice that the cells are fairly regular in shape, most being longer than they are wide. You should see that each cell is surrounded by a thin, clear layer—the cell wall. Observe that there are numerous oval bodies within each cell. These are chloroplasts, the organelles responsible for photosynthesis. Each cell also contains a nucleus. Although the nucleus is larger than a chloroplast, it is difficult to find in an unstained cell because it is only slightly darker than the rest of the cytoplasm and often is hidden by the chloroplasts.

2. Do you find that most of the chloroplasts are concentrated against the inner cell wall? If so, what is the likely explanation?

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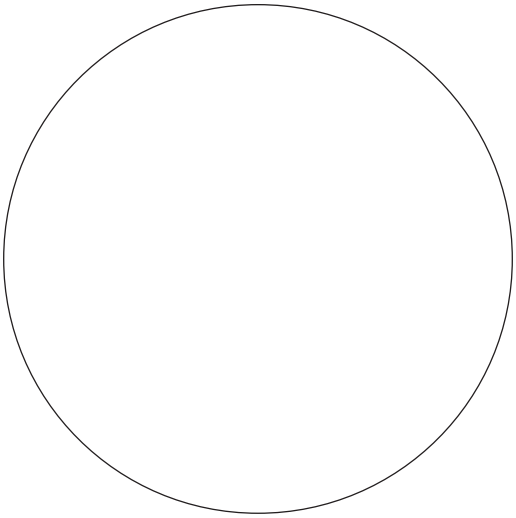
After making your observations, draw an *Elodea* cell in the circle. Make your drawing as accurate as possible. Label the cell wall and chloroplasts.



***Elodea* Cell at High Power Magnification**

3. The cytoplasm in a cell may move, carrying organelles along with it. Cytoplasmic streaming is called cyclosis. Do you see any indication of cyclosis in the *Elodea* cells? If so, describe what you see.

4. Based on your observations, list at least 2 features of *Elodea* cells that you would not expect to find in an animal cell.

5. a. If the surface area of an *Elodea* leaf is 30 mm^2 and the average surface area of its cells is 0.0013 mm^2, how many cells compose the leaf? (Remember to account for the cell layers in the leaf.) Show your work.

   b. If each cell averages 30 chloroplasts, how many chloroplasts are in the leaf?

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CB163961603