**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**AP Biology Hr. \_\_\_\_\_\_\_\_\_\_**

**Ch. 6 Laboratory Variations in Cell Structure**

**Purpose**

To examine several kinds of cells and observe both the similarities and differences.

**Part I. EXAMINATION OF VARIOUS CELLS.**

Since plants lead a stationary existence, it is appropriate that their cells have a rigid cell wall for support. Animals on the other hand are mobile and need more flexible cells. In this part of the lab you will study their various types of cells to determine other differences between them.

 **Procedure and Observations.**

 **Section 1: Cells of Anacharis**.

**A.)** Remove a fresh, green leaf from an anacharis plant, and hold it in your hand for a few minutes to warm the plant. Mount the entire leaf in 1 drop of water and cover it with a cover slip.

**B.)** Examine all areas of the leaf under low power. Then select a portion where the cells are clearly visible, center it in the field, and bring it into focus under high power

**C.)** Shift the focus with the fine adjustment to study the cells at various depths.

1. In which layer are the wider cells located? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.What are the oval green bodies called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.Are these structures moving? \_\_\_\_\_\_\_\_ If so; Are they moving in the same direction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_; Are they moving at the same rate? \_\_\_\_\_\_\_\_\_; and are they moving in the same direction\_\_\_\_\_\_\_\_\_\_.

**D.)** Draw a single cell in the space provided. Be sure to make the objects the correct shape size and number as you see them under the microscope. Also include the correct power of magnification. and label all the parts that you observe.

**Anacharis Leaf (H. P) Magnification\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Section 2 Cells of a Potato**:

**A.)** Cut a piece of a potato about 1/4 inch wide and 1 inch long.

**B.)** With a microtome or a razor blade shave of a piece of potato as thin as possible.

**C.)** Prepare a wet mount as in section 1 and examine it under low power.

4. Describe the cells

5 Can you find any chloroplasts in the cell?\_\_\_\_\_\_\_\_\_

Now add 1 drop of Iodine at the edge of the cover slip and observe the cell as the iodine diffuses into it.

6.What color does the potato turn? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Why?

7. Where does this color change take place in the potato cell?

8. Describe the organelles that you see (shape and color)

9. What type of carbohydrate do potatoes store?

10. They store those carbohydrates in organelles called plastids. What specific type of plastid is used in this case? (look it up)

**D.)**  Find a cell whose cell walls are visible and in which you can find numerous starch grains. Change to high power and draw the cell or a group of them. Color in the starch grains and label the visible parts.

**Potato Cell (L.P.) Potato Cell (H.P.)**

**Section 3 Cells of the tomato skin**.

A.) Remove a small section of tomato skin about 1/4 inch square from a fresh tomato.

B.) Scrap off any pulp left on the skin.

C.) Mount the skin inner surface down, in a drop of water and add the cover slip.

D.) Examine under both low and high power.

11. Is the tomato skin more than 1 cell thick?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. Are all the cells the same size and shape? \_\_\_\_\_\_\_\_\_\_\_\_\_

13. Describe the structure of the cell wall\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. What pigments do you find in the cell? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. Are these pigments contained in the chloroplasts?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Draw several cells in the spaces provided and label the parts that you can identify.

 **Tomato Skin (L. P.)** **Tomato Skin (H.P.)**

**Section 4 Cells in tomato Pulp**.

A.) Smear a small amount of fresh pulp on a slide. And examine under low power. Use the diaphragm on the microscope to reduce the light so you can see the cell structures clearly.

16. What are the color of the cells? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

17. What are the shape of the cells? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

18. How does this shape compare with the shape of the tomato skin cells?

19. Account for the red color in the whole tomato?

Draw a tomato cell in the space provided and label the cell wall, chromoplasts, cytoplasm, nucleus, and nucleolus

**Tomato Pulp Cells (L. P)**

**Human Cheek Cells** (Epithelial Cells).

A.) Gently scrape the inside of your cheek with a clean toothpick.

B.) Smear the material on a slide and add 1 drop of water.

C.) Add 1 drop of Methylene Blue and cover the material.

D.) Examine under low power, noting the masses of cells and individual cells. Draw these cells under both low and high power. Label the structures that you can see.

E.) Reduce the light and look at the cytoplasm.

 **Human Cheek (L. P.)** **Human Cheek (H.P.)**

23. Compare the shape of this cell with the cells in plants.

24. Does the cell have a definite shape? \_\_\_\_\_\_\_\_\_\_

**Onion Cells**

A. Remove a scale of onion and peel the skin from the inner surface. Place a small section on a slide in a small drop of water. Place a coverslip on it and observe on 40X, 100X, and 400X.

25. What color is the cytoplasm?

26. Do you see any movement of cells?

**Add a drop of methylene blue stain under your cover slip.**

27. What structures are more visible now?

28. Are all the cells the same shape? What is their general shape?

In the space below draw a small group of cells showing their overall appearance. Then, draw one large cell and label the **cell wall, cell membrane, cytoplasm, nucleus, and nucleolus**.

**One Cell Group of Cells (L.P.)**

**Group of Cells (H.P.)**

29. What are the three domains of life? Where do the 6 kingdoms fit? What type of cell (prokaryotic or eukaryotic) is each kingdom? Draw a diagram to demonstrate your knowledge.

30. Create a Venn Diagram to compare and contrast prokaryotes and eukaryotes

31. Create a Venn Diagram to compare and contrast plant and animal cells

32. How can you apply the concepts that evolution is both unifying and diversifying to the above information?