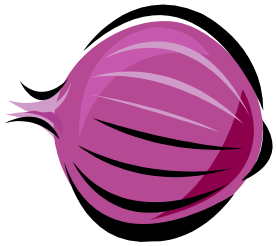
Comparing Plant and animal cells

Objectives:

- **Distinguish between plant and animal cells by their structures**
- **Demonstrate the benefit of stains**
- **Acquire ability to prepare wet mounts**

Safety:

- **Methylene blue stain is poison!! Keep your hands away from your face. Wash your hands before you leave the lab.**



Procedure A: Onion Cells

1. Place a small drop of water in the center of a clean slide.
2. Using the onion at your table peel a VERY, VERY, VERY thin section of onion. Make sure the section contains the red color.
3. Place the onion sample on the drop of water
4. Carefully place a coverslip over the drop of water and onion.
5. Place the slide on the stage of the microscope with the onion and locate the onion and focus on low power.
   a. ***Look towards the edge of the cell to locate single cells. Cells in the middle will be clumped together and difficult to distinguish.***
6. Switch to high power and observe the cells of the onion
7. Draw a single cell that you have located and label the parts that you can identify. These parts should include: CELL WALL, NUCLEUS, and CYTOPLASM.
8. Make sure to draw lines to each organelle so we can see what you are talking about.

Procedure B: Plant

1. Place a small amount of clear fingernail polish on the top of the leaf (Shiny side). Cover enough area to have about a bean size sample. Blow on it so it will dry.
2. When the fingernail polish is dry, gently peel off the fingernail polish and place onto slide.
3. Add a drop of water and a coverslip.
4. Locate the cells on the slide using low power.
5. Switch to high power and observe the cells.
6. Draw a single cell that you have located and identify the parts. These parts should include: CELL WALL, CHLOROPLAST, STOMATA and CYTOPLASM.
7. To better view the other organelles we will stain the cell with a saline (salt) solution.
8. Remove the slide from the stage of the microscope.
9. Place one drop of the saline solution along one side of the coverslip.
10. On the opposite side of the coverslip, place a small piece of paper towel. The paper towel draws the solution under the coverslip.
11. Locate the cells under low power.
12. Change to high power and observe the plant cells.
13. Label the parts you can identify. These parts should now include: CELL WALL, CHLOROPLAST, NUCLEUS, CELL MEMBRANE, VACUOLE, and CYTOPLASM.
    a. ***Make sure you draw lines to each organelle so we can see what you are talking about.***

Procedure C: Cheek Cells

1. Place a small drop of water in the center of a clean slide.
2. Using a toothpick at your table, GENTLY scrape the inside of your cheek. You do not have to use force when scraping the inside of your cheek.
3. Stir the water on the slide with the end of the toothpick to mix the cheek cells with the water. Dispose of the toothpick.

4. Carefully place a coverslip over the drop of water and the cheek cells.

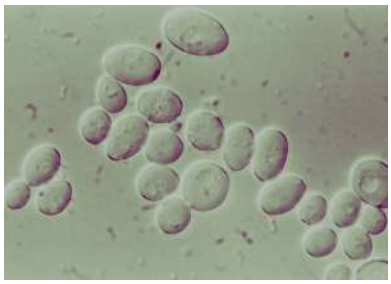
To better view the other organelles we will stain the cell with a Methylene blue.

5. Place on drop of Methylene blue along one side of the coverslip.
6. On the opposite side of the coverslip, place a small piece of paper towel, to draw the solution under the coverslip across the slide.
7. Locate the cheek cells and focus while on low power.
8. Switch to high power and observe. Try to single out a solitary cell instead of a clump of cells.
9. Draw a single cell that you have located and label the parts you can identify. These parts should include: CELL MEMBRANE, NUCLEUS, and CYTOPLASM.

    Make sure you draw lines to each organelle so we can see what you are talking about.

Procedure D: Cork Cells

1. Place a small shaving of cork onto a clean slide.
2. Place a small drop of water onto the slide and carefully add a coverslip.
3. Locate the cork cells on low power.
    a. ***Look towards the edge of the cell to locate single cells. Cells in the middle will be clumped together and difficult to distinguish.***
4. Look for the cell wall.
5. Draw a single cell that you have located.



Procedure E: Yeast Cells

1. Put a drop of yeast on a slide and add a cover slip.
2. Observe under low, medium and high powers.
3. Add a drop of iodine stain to the edge of the coverslip.
4. On the opposite side of the coverslip, place a small piece of paper towel, to draw the solution under the coverslip across the slide.
5. Observe under low power then again under high power.
6. Sketch five cells and their internal structures.

Analysis Questions: 

1. **What is the general shape of the cork cells?**
2. **What do you think is inside of these cells?**
3. **In this lab you observed two plant cells, how were they different? How are they alike?**
4. **Why do you think we added saline solution to the leaf sample? What advantage did it offer?**
5. **How were the plant cells different from the cheek cells? How are they similar?**
6. **Why do you think we added Methylene blue to the cheek cell sample?**
7. **If you were given a slide containing living cells of an unknown organism, how would you identify the cells as either plant or animal?**
8. **What is the function of chloroplasts?**
9. **How is the flatness of cheek cells related to their function?**
10. **How does iodine stain yeast and potato differently?**
11. **How do you think yeast cells reproduce?**
12. **What is the function of a stomata opening?**

All observations, sketches and answers to questions can be completed on a separate piece of paper.

Remember to label your sketches!!