Cell Lab (3)

**Introduction:**

When Robert Hooke developed the microscope in the 1600’s, it revolutionized the way humanity views life. Looking at slices of cork he noticed the material was organized into “cells”. During this century, many other scientists observed other living organisms, and they discovered all life contained these cell structures. This work is the basis for the modern cell theory, which states:

1. All living organisms are made up of one or more cells.
2. The cell is the basic unit of life.
3. All new cells come from cells that are already alive.

Even though all organisms contain cells, the structure and function has diversified over the course of Earth’s history. Plant cells, animal cells, fungal cells, and bacterial cells have all developed unique characteristics despite sharing many core similarities.

Your task in this lab is to observe the similarities and differences in the diversity of cells that exist on Earth. You will then make inferences to suggest possible reasons for the similarities and differences.

*\*Answer questions on a separate sheet of paper.* ***Use full sentences.\****

**Part A: Eukaryotic cells**

**Specimen 1: ONION SKIN CELLS – No Stain**

1. Describe the shape of the onion skin cells.
2. Describe any structures you see inside the cells.
3. Describe the organization of onion skin cells compared to each other.
4. How does the shape and size of onion skin cells compare to each other?

**Specimen 2: ONION SKIN CELLS – Iodine Stain**

1. Sketch what you see under the microscope.

100x

400x

1. How did the stain change what you observed?

Before stain:

After stain:

1. What was the effect of adding iodine to the onion skin cells? What became visible?
2. Based off your observations about the structure of the cell, what could be the functions of the structures in the cell?

**Specimen 1 Directions**

1. **Obtain a microscope slide, slide cover, a thin onion slice, a water dropper, and forceps**
2. **Place onion slice onto microscope slide**
3. **Add 1-2 drops of water on the onion slice.**
4. **Place coverslip on top of onion slice**
5. **Examine under microscope**

**Specimen 2 Directions**

1. **Obtain a microscope slide, slide cover, a thin onion slice, an iodine dropper, and forceps**
2. **Place onion slice onto microscope slide**
3. **Add 1-2 drops of iodine**
4. **Place coverslip on top of onion slice**
5. **Examine under microscope**

**Specimen 3: ELODEA CELLS:**

1. Sketch what you see under the microscope.

At 100x

At 400x

1. Describe the shape of the elodea cells.
2. Describe any structures you see inside the cells.
3. Describe the organization of elodea cells compared to each other.
4. How does the shape and size of elodea cells compare to each other?
5. How does the elodea cell compare to the onion skin cell?

Shape and size

Structures

Organization

1. Based off your observations about the structure of the cell, what could be the functions of the structures in the cell?

**Specimen 4: MOUTH-LINING CELLS:**

1. Sketch what you see under the microscope.

At 100x

At 400x

1. Describe the shape of the cheek cells.
2. Describe any structures you see inside the cells.
3. Describe the organization of cheek cells compared to each other.
4. How does the shape and size of cheek cells compare to each other?
5. How does the cheek cell compare to the elodea and onion skin cell?

Shape and size

Structures

Organization

1. Based off your observations about the structure of the cell, what could be the functions of the structures in the cell?

**Specimen 3 Directions:**

1. **Obtain a microscope slide, slide cover, elodea leaf, a water dropper, and forceps**
2. **Place elodea onto microscope slide**
3. **Add 1-2 drop of water**
4. **Place coverslip on top of elodea**
5. **Examine under microscope**

**Specimen 4 Directions:**

1. **Obtain a microscope slide, slide cover, toothpick, iodine dropper, and forceps**
2. **Use toothpick to lightly scrape inside of cheek.**
3. **Roll toothpick onto center of slide**
4. **Add 1-2 drops of iodine**
5. **Place coverslip on top of onion slice**
6. **Examine under microscope**

**Part A: Prokaryotic cells**

**Specimen 5 : Prepared bacteria slide**

1. Sketch what you see under the microscope.

At 100x

At 400x

1. Describe the shape of the bacteria in the slide.
2. Describe the organization of bacteria cells compared to each other.
3. How does the shape and size of bacteria cells compare to each other?
4. How does the bacteria cell compare to cheek, onion, elodea, and yeast cells?

Shape and size

Structures

Organization

**Review Questions**

1. **What are differences between the eukaryotic and prokaryotic cells?**
2. **What are differences between plant and animal eukaryotic cells?**
3. **What may be a reason why there are these differences?**
4. **Based on your observations, suggest a research question from your observations.**
5. **What experiment could you create to answer this question?**
6. **What would be the hypothesis for this experiment?**