

The Onion Cell Lab

Mrs. Côté

Biology 11

Background:

Onion tissue provides excellent cells to study under the microscope. The main cell structures are easy to see when viewed with the microscope at medium power. For example, you will observe a large circular **nucleus** in each cell, which contains the genetic material for the cell. In each nucleus, you may find round bodies called **nucleoli**. The nucleolus is an organelle, which synthesizes small bodies called ribosomes. Ribosomes are so small you cannot see them with the light microscope. Also present in the onion cell, is a well-developed **cell wall** and a **cell membrane** just beneath it.

Question:

What does the nucleus and other structures of the onion epidermal cell look like?

Materials:

The following materials are required: onion, microscope, glass slide, cover slip, scalpel, forceps, scissors, paper towel and iodine (**Note:** iodine is toxic and will stain - handle with care).

Procedure:

1. Get a glass slide and cover slip for yourself and make sure they are both thoroughly washed and dried.
2. Using forceps, scissors and a scalpel, remove the single layer of epidermal cells from the inner (concave) side of the scale leaf (the thinner the better). Be careful as the instruments are sharp.
3. Place the single layer of onion cell epithelium on a glass slide. Make sure that you do not fold it over or wrinkle it.
4. Place a drop of water on your onion tissue.
5. Put the cover slip on the tissue and gently tap out any air bubbles.
6. Observe the cells under 4x, 10x, and 40x. You may need to adjust the amount of light for better viewing. Once you have located the cells under high magnification show Mrs. Côté.
7. Remove the slide from the stage. Place a few drops of iodine along the edges of the cover slip and let it soak in. Use paper towel to absorb any excess iodine. (* Iodine can stain/burn, handle with care)
8. Observe the onion cells under low, medium and high. Draw a **sketch** of what you see under **each** magnification.
9. Under high magnification only, **count the number of onion cells that go length wise across the field of view. Repeat this but count how many cells go width wise across the field of view. Record your results in a data table.**
10. Remove the slide from the stage. Wash the onion tissue and iodine down the drain.
11. Using a ruler, measure the field of view under low magnification.
12. Put all of the materials back in the proper locations, and ensure your work area is clean.

Analysis Questions

1. Describe in words the shape of the onion cells you observed.
2. Why was iodine added to the slide?
3. Why were no chloroplast seen in the onion cells? (No, it is not because the microscopes were not powerful enough).
4. Calculate the length and width of 1 onion cell. Be sure to show all of your work.