

Laboratory on Eukaryote Cells

Name _____

Date _____ Per _____

In this laboratory exercise you will be exploring the structures of Eukaryote cells. Eukaryotes have membrane bound organelles in their cytoplasm. Both plant and animal cells will be viewed, drawn and labeled. The objective is to try and utilize various stains and compare what organelles are differentially stained. Four Stains will be used.

Slides to make:

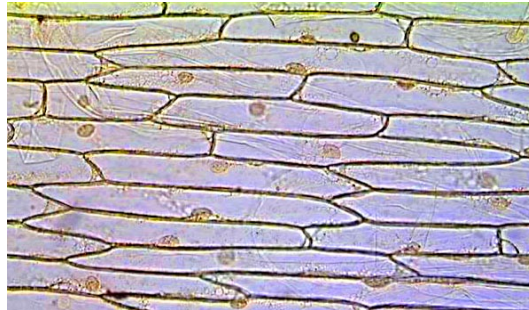


↔Cheek Cells

- × Stained with DNA stain
- × Stained with Iodine
- × Stained with Janus Green
- × Stained with DiO6 Stain

↔Onion Epidermis

- × Stained with DNA stain
- × Stained with Iodine
- × Stained with Janus Green
- × Stained with DiO6 Stain



Procedures

Part A:

1. Obtain a stage micrometer. Look at the micrometer on low power.
2. Measure the distance across on low power (10x). Since the eyepiece is 10x and the objective is 10x then by multiplying them you get the total magnification of 100x.
3. Once you estimate the distance across in mm you can convert to micrometers by multiplying by 1000 or move decimal place three times to the right. (Example 1.5 mm would be 1,500 um)

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4. You can calculate the field of view of the next magnification by using proportions:

Sample

$$(\text{Mag } 1) (\text{Distance } 1) = (\text{Mag } 2) (\text{Distance } 2)$$

If you know the distance across for one magnification you can calculate the distance across of the higher power objective. Look on the side of the objectives for the magnification.

When you look into the microscope on low power (10x) and see how far across the field of vision is (the total lighted area as seen by looking into the microscope with the stage micrometer) you can calculate what the next highest field of vision would be without having to measure.

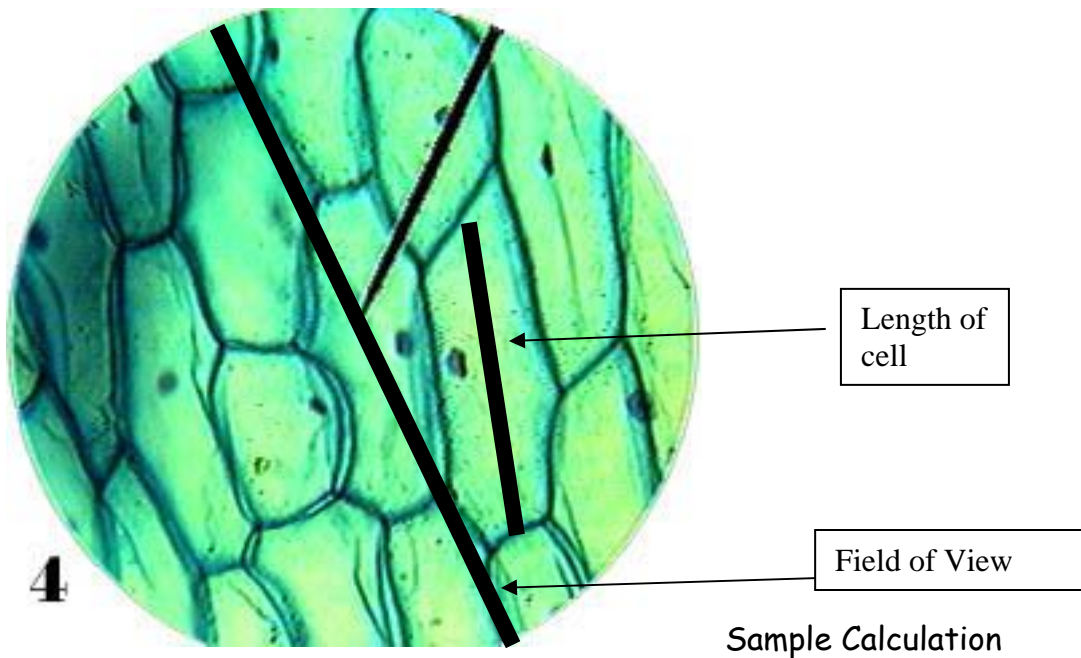
Use the formula above to calculate the next highest objective (show your work)

Part B:

1. Make a wet mount (as demonstrated) of the above living material. Make sure to follow proper staining protocol. If you wish a deep dark stain you can just add the stain to make the wet mount before lowering the coverslip onto the slide. Some stains require that the water be evaporated before you can add the stain. Then you can add water to add the coverslip.
2. Draw in detail on separate drawing paper. Make sure to draw in pencil and shade with small random dots if necessary.
3. Estimate size by dividing the distance across (in micrometers) by the estimated number of the objects that fit across that known distance. (See Example Below)
4. Use the reference books to label all structures possible.
5. Compare the organelles visible with each type of stain.

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Here is onion as viewed at 430x. The distance across is 350 μm .



Size of one cell: Estimated that 2.5 cells would fit all the way across the field of view. If the total field of view is 350 μm then.....

$$\text{One cell} = 350 \mu\text{m} / 2.5$$

140 μm would be the estimate for that one cell. Remember that the other cells visible would be different estimates because they have different sizes as viewed under the microscope.