**Observing Mitosis Lab**

**Background:**

In a growing plant root, the cells at the tip of the root are constantly dividing to allow the root to grow. Because each cell divides independently of the others, a root tip contains cells at different stages of the cell cycle. This makes a root tip an excellent tissue to study the stages of cell division.

**Materials:**

Microscope Prepared slides of onion (*Allium*) root tips & whitefish mitosis & parascaris (roundworm)

**Procedure:**

1. Get a microscope for your lab group and carry it to your lab desk with two hands. Make sure that the low power objective is in position.
2. Obtain a prepared slide of an onion root tip (there will likely be more than one root tip on a slide). Hold the slide up to the light to see the pointed ends of the root sections. This is the root tip, where the cells were actively dividing. (The root tips were freshly sliced into thin sections, then preserved when the slide was prepared.)
3. Place the slide on the microscope stage with the root tips pointing away from you. Using the low-power objective to find a root tip, and focus it with the coarse adjustment knob until it is clearly visible. Just above the root “cap” is a region that contains many new small cells. The larger cells of this region were in the process of dividing when the slide was made. These are the cells that you will be observing. Focus and centre the image then switch to medium power. Focus and centre the image again and then switch to high power.
4. Observe the box-like cells that are arranged in rows. The chromosomes of the cells have been stained to make them easily visible. Select one cell whose chromosomes are clearly visible. (If you need to change the focus when using the high power objective, remember to only use the fine adjustment knob).
5. Look for cells in each of the phases: interphase, prophase, metaphase, anaphase, telophase and telophase and draw a rough draft of each of these cells.
6. Pick any two of the phases and draw biological diagrams of them.
7. As you look at the cells of the root tip, you may notice that some cells seem to be empty inside (there is no dark nucleus or visible chromosomes). This is because these cells are three dimensional, but we are looking at just thin slices of them. (If you slice a hard boiled egg at random, you wouldn’t definitely see the yolk in your slice!)

**To Be Complete:**

* Rough sketches of interphase, prophase, metaphase, anaphase and telophase.
* Make up a data table to record the number of cells that you see in each of the stages of mitosis. The easiest way to do this is for one person to look through the microscope, going along each row of cells. For each cell say out loud what stage the cell appears to be in. Another student can make tally marks for each stage.
* Answers to the analysis and conclusions questions.

**Observing Mitosis Lab Name:**

Sketches of interphase, prophase, metaphase, anaphase and telophase:

**Analysis and Conclusions:**

1. **Data table:**

|  |  |
| --- | --- |
| **Phase of Cell Cycle** | **Tally** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. What stage were the majority of cells in? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What percentage of the cells were in each stage? Please show your work!

Interphase

Prophase

Metaphase

Anaphase

Telophase

1. What evidence shows that mitosis is a continuous process, not a series of separate events?
2. The onion plant began as a single cell with 16 chromosomes. How many chromosomes are in each cell that you observed? How do you know?
3. Based on this lab, which phases of mitosis were the most difficult to distinguish between? Why?