**Mitosis in Onion Root Tip**

Names\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

In this activity, you will be presented with cells from the tip of an onion root. You will classify each cell based on what phase it is in. At the end you will count up the cells found in each phase and use those numbers to predict how much time a dividing cell spends in each phase. You can base your calculation on a total cell cycle of 24 hours.

* Go to <http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/cell_cycle.html>
* Read through the first two pages. When you reach the chart, click through to begin classifying the cells. (You do not need to copy the chart yourself; I’ve created an Excel file that you can access on Moodle, or you can use the table below).
* Follow the directions to classify each cell as being in one of the phases.

**You can enter data in this table as you go along, or at the end of the activity.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Interphase | Prophase | Metaphase | Anaphase | Telophase/  Cytokinesis | Total |
| Number of cells |  |  |  |  |  | 36 |
| Percent of cells |  |  |  |  |  | 100% |

1. Enter your percentages into the Excel spreadsheet to **create a graph** of the amount of time a cell spends in each stage of cell division. Reproduce that graph in the space below:

1. In this virtual exercise, which stage of the cell cycle is the longest?
2. Why do you think root tips might be a good choice for viewing cells in different stages of the cell cycle?

Now, ask Professor St. John for help setting up a microscope, and focusing on the prepared, stained onion root tip slides. When you have been able to focus on a segment of the slide where mitotic stages are visible, work with your partner to classify these stages, as you did in the virtual exercise. (If you have difficulty with the slide, you may use the photograph of the onion root tips instead).

Use the table below to tally the number of cells in each phase:

|  |  |  |
| --- | --- | --- |
| ***Phase*** | ***Tally # of Cells*** | ***Total*** |
| Interphase |  |  |
| Prophase |  |  |
| Metaphase |  |  |
| Anaphase |  |  |
| Telophase/Cytokinesis |  |  |

In the space below, draw and label an example of each of the 5 cell phases:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |

Once you have counted the cells on the slide, enter these data into the Excel spreadsheet, on the tab labeled “**Onion Root Microscopy**.” As before, this will generate a graph for you, of the time spent in each phase of mitosis.

1. In the space below, recreate the graph from the Excel sheet:
2. Did you have similar results across the two exercises? If not, why do you think this might be?

Adapted from The University of Arizona’s Biology Project: <http://www.biology.arizona.edu/cell_bio/activities/cell_cycle/assignment.html>