

Time in Mitosis Lab
Cell Division
Honors Biology
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Introduction

You know mitosis as the process that distributes replicated chromosomes to new daughter nuclei. We have also discussed mitosis as a continuous process understanding that the phases are just easy ways to divide the process up to better understand when the major events occur. This brings up an interesting question. How long do each of these phases take? Do some phases take longer than the others? Why would one phase take longer than another? Is this different for different types of cells?

Your task

You must devise a procedure to determine the time each phase of mitosis takes in both plant and animal cells. For this purpose we will only focus on interphase and four stages of mitosis (prophase, metaphase, anaphase, and telophase). You must create a hypothesis that defines your expected results. You must then calculate the time each phase takes and create a graph that best represents that data. You will then compare your data with the rest of the class. All of this information must be clearly described in your lab notebook.

Materials

In this lab you will have access to the following tools:

- a light microscope
- a prepared slide of whitefish cells
- a prepared slide of *Allium* root tip, longitudinal section

Procedure

You will create your own procedure and it must be approved and written out by all group members before you enter the lab.

Results

Results should be in the form of both a table and a graph. You should also include sample drawings of each phase.

Questions that should be addressed in your discussion/conclusion.

- Was your hypothesis supported by your results?
- Which phase took the longest time to complete? How do you explain this?
- Which phase took the least amount of time to complete? How do you explain this?
- Overall, How does the class data compare with your results?
- Does the class data support your hypothesis?
- What possible errors could you have? What strengths and weaknesses did your procedure have? Is there anything you would change?

Post-lab Questions

Directions: Examine the table below and answer the following questions.

Table 1: Time of Mitosis in Normal and Cancerous Chicken Stomach Cells

PHASE OF MITOSIS	NORMAL CHICKEN STOMACH CELLS (IN MINUTES)	CANCEROUS CHICKEN STOMACH CELLS (IN MINUTES)
Prophase	60	15
Metaphase	10	2
Anaphase	3	1
Telophase	12	3

For the following questions refer to the Table 1 above.

- 1) Create one graph to represent both sets of data.
- 2) Which phase for normal cells requires the longest time for completion? How does this compare to the data you collected?
- 3) How do the cancer cells differ from the normal cells with regard to time? How does this fit with what you know about cancer?
- 4) What factors cause cancer cells to be able to reproduce more quickly?
- 5) Calculate the number of normal chicken cells that would be produced in one day (assuming interphase takes 90 minutes). Also calculate the number of cancerous chicken cells that would be produced in a day (assuming interphase takes 30 minutes). You must show all work.