Lab Onion Root Tip

Class Copy

Do NOT take home!!

Background

A single fertilized human egg cell will divide to form two cells. These two cells will each divide into two cells. In time, trillions of cells are produced. The cycle of growth and division takes place in three major stages:

1. Interphase: The life and times of the cell (including growth and prep for division).

2. Mitosis: The division of nuclear material, in which each new cell obtains the same number of chromosomes and the same DNA code as the original cell. It occurs in four phases.

3. Cytokinesis: The division of the cytoplasm to create two new cells. After cytokinesis, each cell enters the stage of interphase.

**Purpose:**

In this investigation, you will

* Locate cells in prepared onion root slides that are in the process of interphase and dividing mitosis.
* Identify cells in interphase and in each of the four stages of mitosis in the onion root tips buy comparing them with diagrams.
* Study the changes which occur in a cell as it undergoes the cell cycle

Materials:

Microscope

Prepared Slide of Onion Root Tip (Alium)

Lens Paper

Page 1

Lab Title

Your Name, Partner Name

Date

Period

Purpose:

Materials:

Procedure:

**Lab Packet Set-Up**

1. Create a lab packet consisting of the following pages, in this order:
   1. A lined (or graph) paper cover sheet
   2. 3 white pages of paper, divided in half to create two drawing pages each
   3. A second separate lined (or graph) paper for the analysis questions.
2. On the cover sheet:
   1. Write a title, your name (circled) and your partners name, the date and your period
3. Copy the purposed, materials, and procedure onto the first page, below your title and heading
4. Title each half-page with the cell cycle phases in order. Start with interphase and end with cytokinesis. Next to the title on each page, label the total magnification high power of the microscope. You can answer the analysis questions for each

Interphase Prophase

Questions: Questions:

Metaphase Anaphase

Questions: Questions:

Telophase Cytokinesis

Questions: Questions:

Page 2 Page 3 Page 4

**Procedures:**

1. Turn on the microscope and focus the cells on high power. The dividing cells will be found near the root tip.
2. Using the “Rules for Lab Drawings,” draw an example using high power of each phase. Label the appropriate structures on each of the drawings of the phases (You may use color if you wish).

***Make sure you draw and label only what you see, not what you think you should see.***

chromosomes

spindle fibers

nucleus

nucleolus

chromatin

metaphase plate (label where the region is)

cell plate

cell wall

poles

1. Answer phase appropriate questions, in complete sentences, from **“Analysis Questions”** packet, on the backside of each picture.
2. Complete Analysis Questions #1 and 2 on last page of lab.

Analysis Questions For Onion Root tip Lab

Answer phase appropriate questions, in complete sentences, on the bottom of the lab drawing. You may also use the back of the drawing page, if you like. Answer the questions in complete sentences.

***Interphase***

1. What is the DNA called in this stage?
2. Describe the contents of a nucleus during interphase.
3. Are a nucleolus and a nuclear membrane present in the cell?
4. Are distinct rod-shaped structures called chromosomes easily observed in the nucleus at this time?
5. What term is used to describe nuclear contents during interphase?
6. What important event(s) occurs to DNA during interphase?

***Prophase***

1. What is the DNA called in this stage?
2. Describe the changes that have occurred to the nucleolus and nuclear membrane from interphase to prophase.
3. Explain why the DNA can now be observed but were not observable during interphase.

***Metaphase***

1. What is the DNA called in this stage?
2. Describe where the DNA is now located in relation to the cell.
3. Can evidence of DNA duplication (replication) now be observed?
4. What are the fibers called that become visible during this phase?
5. What term is used to describe the structure at which each fiber attaches to a chromosome?

***Anaphase***

1. What is the DNA called in this stage?
2. In metaphase, chromosome pairs were lined up along the cell’s center. Describe what is occurring to each chromosome pair during anaphase.
3. Toward what area of the cell is the DNA being directed?
4. What structure is responsible for the movement of chromosomes during this phase?

***Telophase***

1. What is the DNA called in this stage?
2. What cell parts begin to reappear during this phase?

***Cytokinesis***

1. What is the DNA called in this stage?
2. How many cells have now formed from an original cell?
3. Compare the two newly formed cells; how are they the same or different, and how did they get that way?
4. Explain how the number of chromosomes found in each daughter cell compares to the number found in the original cells before mitosis.

***Analysis***

1. The term “mitosis” comes from the Greek word meaning “thread.” Explain why this word may be helpful in describing this process of nuclear division.
2. Explain how the process of mitosis helps an organism to grow in size.