

Lab Onion Root Tip

PROCEDURES

Introduction:

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 by 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

PROCEDURES:

- 1) Observe the onion root tip slide on high power using correct microscope procedures.
- 2) The dividing cells will be found near the root *tip*. Find the region of dividing cells.
- 3) You will be attaching drawings of the phases on white paper into your lab notebooks.
- 4) Using the "Rules for Lab Drawings," draw one example of each phase of the Cell Cycle using high power. Each phase should take up the attached white paper. Use only the front side of the paper for drawings. Next, answer the corresponding questions on the notebook paper underneath the drawing.
- 5) Label the appropriate structures on each of the drawings of the phases (You may use color if you wish).

Chromosomes (single or double stranded)

chromatin

spindle fibers

metaphase plate

nucleus

cell plate

nucleolus

poles.

LABEL ONLY WHAT YOUR SEE, NOT WHAT YOU EXPECT TO SEE!!!!

- 6) Get each drawing stamped by Mr. Goodenough before moving on to the next phase.
- 7) Complete "General" Questions on the last page.

ANALYSIS QUESTIONS FOR ONION ROOT TIP LAB

Answer phase appropriate questions, in complete sentences.

Interphase

1. Describe the contents of a nucleus during interphase.
2. Are distinct rod-shaped structures called chromosomes easily observed in the nucleus at this time?
3. What important event(s) occurs to chromosomes during interphase?

Prophase

4. Are chromosomes now visible during prophase?
5. Describe the changes that have occurred to the nucleolus and nuclear membrane from interphase to prophase.
6. Explain why chromosomes can now be observed but were not observable during interphase.

Metaphase

7. Describe where the chromosomes are now located in relation to the cell.
8. Can evidence of chromosome duplication (replication) now be observed?
9. What are the fibers called that become visible during this phase? What term is used to describe the structure at which each fiber attaches to a chromosome?

Anaphase

13. In metaphase, chromosome pairs were lined up along the cell's center. Describe what is occurring to each chromosome pair during anaphase.
14. Toward what area of the cell are the chromosomes being directed? What structure is responsible for the movement of chromosomes during this phase?

Telophase/Cytokinesis

16. What cell parts begin to reappear during this phase?
17. Explain how the number of chromosomes found in each daughter (reproduced) cell compares to the number found in the original cells before mitosis.

General

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