

Lab 8: Mitosis and Meiosis

Problem: What occurs during the different phases of mitosis? Why is the cell division called meiosis necessary for the production of sex cells (gametes)?

Materials:

Onion root tip slide

Microscope

Procedure & Background:

Living things must grow in order to survive. Organisms grow by the process of cell division known as mitosis. In mitosis the nucleus of the cell undergoes a series of changes resulting in two nuclei. Then the cytoplasm divides which is called cytokinesis. This results in two new cells identical to the parent cell. The **phases of mitosis** are called prophase, metaphase, anaphase, and telophase. The period **between phases** is called interphase. During interphase the genetic material of the cell is in the form of chromatin.

Meiosis is a special kind of cell division during which the sex cells (the female egg cell and the male sperm cell) are formed. There are two stages in meiosis. Cell division occurs in each stage. The resulting gametes have half, or the haploid (n) number of chromosomes. When fertilization (the union of sperm and egg) takes place, the zygote has the diploid ($2n$) number of chromosomes. Then the new individual develops by mitotic division.

Data:

Part I. Label the diagram of Mitosis:

Part II. Investigation.

Obtain a prepared slide of an onion root tip. Examine your slide under medium power of your microscope. In the onion root tip, most of the dividing cells will be found between the tip of the root and the place where the cells are beginning to elongate. Observe the cells more closely under high power. Try to locate as many phases of mitosis as you can on your slide. Compare the mitosis in the onion root with the diagram in the Data.

Obtain a prepared slide of an onion root tip. Find each stage of mitosis and interphase on your slide. When you find one, raise your hand and ask your teacher to confirm the stage that you have found. Your teacher will initial your lab paper.

INTERPHASE _____

PROPHASE _____

METAPHASE _____

ANAPHASE _____

TELOPHASE _____

Analysis

1. Compare cytokinesis of animal daughter cells with that of plant cells. (BOOK)
2. List the stages of mitosis.
3. What is the significance (importance) of mitosis?
4. What is the stage between mitosis called?
5. During what stage does the cell spend most of its time?
6. How would you define meiosis?
7. What is the significance of meiosis?
8. What would happen if there were no meiosis?