

Lab 7 – 11/07 or 11/08

PART I - Mitosis and the Cell Cycle in Onion Root-Tip Cells

Introduction:

In this lab, you will observe the various stages of mitosis in onion root tip cells. Cell division is especially rapid in the growing root tip, therefore, it is easier to observe each stage of mitosis than in slowly growing tissues. You will harvest the young tips, fix them, digest them in acid, treat them with a reagent which stains chromosomes, and view them under a microscope. You will then estimate the proportion of time that cells in actively dividing tissues, such as the root tip, actually spend in M-phase and cytokinesis.

Materials:

Carnoy's fixative (1:3 HOAc:EtOH)
1N HCl
Feulgen stain
45% HOAc
Freshly sprouted seeds, about 2-3 cm long

Equipment:

Eppendorfs
Pasteur pipets
60 °C Waterbath
microscope slides
razor blades
cover slips

Protocol:

Monday or Tuesday prior to lab:

1. Cut off the last 6 mm (1/4 inch) of root tip from sprouting onions. Place 5 of them in the labeled Eppendorf tube.
2. Add 1 ml Carnoy's fixative and make sure that all tips are immersed.
3. Close tube and incubate for 24 hours.

Tuesday or Wednesday in lab:

4. Remove your root tips from the Carnoy's fixative and immerse in a new tube filled with 1 ml 1N HCl. Incubate for 12 minutes at 60C.