Edexcel (B) Biology A-level

CP03 - Calculating mitotic index

Flashcards

Where in plants can cells undergoing mitosis be found?

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Meristem tissue at shoot and root tips.

What is the mitotic index?

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The ratio of cells undergoing mitosis to the total number of cells in a sample.

Outline the procedure to prepare a root tip slide.

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1. Warm 1M HCl to 60°C in a water bath.
2. Cut a root tip using a scalpel and add to the HCl. Leave for 5 minutes.
3. Remove from HCl and wash with cold distilled water.
4. Dry and place on a slide. Macerate with needle to spread out th cells.
5. Add a few drops of stain to make chromosomes visible.

State the formula for the mitotic index.

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Mitotic index =

Number of cells with visible chromosomes /

Number of cells in sample

State the hazards and precautions for reagents used in this procedure.

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HCl - corrosive, avoid contact with skin, wear eye protection

Toluidine Blue O stain - irritant, avoid contact with skin, wear eye protection

Scalpel - cut away from fingers

Why is the root tip placed in hot HCl?

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HCl dissolves the middle lamellae in order to break up the cellulose cell wall. This allows the stain to permeate and the tip to be squashed more easily.

Why is the sample squashed?

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To flatten the sample and reduce the number of layers, reducing overlap so the cells can be observed more clearly.