InkBiology

QUESTION WORKBOOK

Homeobox genes and apoptosis: laying a body out, and carving it

Cell cycles, reproduction and development · Unit B06

OCR A 6.1.1

7 questions · 22 marks

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SECTION A · Short, 1 to 2 marks

A1 HG-Q7

State the length of a homeobox in base pairs, and the length in amino acids of the homeodomain it codes for. [2]

SECTION B · Standard, 3 to 5 marks

B1 HG-Q1

Describe the changes that take place in a cell during apoptosis, in the order in which they occur. [4]

B2 HG-Q2

A homeobox of 180 base pairs lies within a gene 1200 base pairs long. Calculate the number of amino acids in the homeodomain, and the percentage of the gene that the homeobox occupies. [4]

B3 HG-Q3 Explain why a mutation in a single homeobox gene can alter the development of a whole region of an animal. [3]

B4 HG-Q4 Compare the events of apoptosis with the events of necrosis in a tissue. [3]

B5 HG-Q5 The hand of a human embryo is at first a flat plate of tissue with no separate fingers. Explain how mitosis and apoptosis together produce five separate digits. [3]

B6 HG-Q6 Cells in some tumours fail to undergo apoptosis even though their DNA is damaged. Suggest how this failure contributes to the growth of the tumour. [3]

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