



QUESTION WORKBOOK

Control of gene expression: which genes a cell reads

Gene regulation, genomics and biotechnology · Unit B17

AQA 3.8.2.1, 3.8.2.2 · OCR A 6.1.1 · Edexcel A Topic 3 · CAIE 16.2

5 questions · 16 marks

NAVY SCREEN EDITION

SECTION A · Short, 1 to 2 marks

A1 State the effect that increased methylation of a promoter has on transcription of the gene, and state the effect of decreased acetylation of the histones around it. [2]

SECTION B · Standard, 3 to 5 marks

B1 Describe how the lac operon is switched on when lactose enters an *Escherichia coli* cell, naming the parts of the operon involved. [4]

B2 Explain why oestrogen can act on a gene inside the nucleus while a peptide hormone such as insulin cannot. [4]

B3 Explain how small interfering RNA stops a protein being produced from a gene that has already been transcribed. [3]

B4 A drug occupies the hormone-binding site of the oestrogen receptor without changing the receptor's shape. Suggest the effect of this drug on transcription of an oestrogen-responsive gene, and suggest why it affects breast tissue far more than liver tissue. [3]
