



## 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

PRINT 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]

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**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]

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

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

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- 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]

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