

Edexcel (B) Biology A-level

7.2 - Factors affecting gene expression

Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



What is a transcription factor?



What is a transcription factor?

A protein that controls the transcription of genes so that only certain parts of the DNA are expressed, e.g. in order to allow a cell to specialise.



How do transcription factors work?



How do transcription factors work?

They move from the cytoplasm into the nucleus, bind to the DNA near their target gene, and then either increase or decrease the rate of transcription.



What is splicing?



What is splicing?

In eukaryotic cells, mRNA contains non-coding regions called introns. These are removed, and the coding regions (exons) are joined back up by enzymes.



How can splicing result in different products from a single gene?



How can splicing result in different products from a single gene?

When the exons are joined back together by enzymes, they can be joined in a variety of ways. Therefore several different versions of the RNA can be produced.



What is meant by epigenetics?



What is meant by epigenetics?

A heritable change in gene function
without change to the base sequence of
DNA.



How can non-coding RNA affect gene expression?



How can non-coding RNA affect gene expression?

There are many types of non-coding RNA. Some interfere with protein translation, some are involved in splicing, some chemically modify other RNAs.



How can histone modification affect gene expression?



How can histone modification affect gene expression?

Addition of an acetyl group activates chromatin, allowing transcription.

Addition of a methyl group can either activate or inactivate chromatin depending on the position of the lysine.



How can DNA methylation affect gene expression?



How can DNA methylation affect gene expression?

Involves addition of a CH_3 group to cytosine bases, which prevents transcription factors from binding. Therefore gene transcription is suppressed.



How are epigenetics involved in cell differentiation?



How are epigenetics involved in cell differentiation?

Epigenetics control the amount of a cell's DNA that is transcribed, and therefore ensures only the proteins needed for that specific cell's function are produced.

