

AQA Biology A-level

8.1 - Alteration of the sequence of bases in DNA can alter the structure of proteins

Flashcards

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What is a mutation?



What is a mutation?

An alteration to the DNA base sequence.
Often arise spontaneously during DNA replication.



What are addition and deletion mutations?



What are addition and deletion mutations?

Where one or more nucleotides (bases) are either inserted or deleted from the DNA sequence.



What is a substitution mutation?



What is a substitution mutation?

Where one nucleotide (base) in the DNA sequence is replaced by another.



What is a duplication mutation?



What is a duplication mutation?

Where one or more nucleotides (bases) duplicate and repeat.



What is an inversion mutation?



What is an inversion mutation?

Where a group of nucleotides (bases) become separated from the DNA sequence, then rejoin in the reverse order i.e. they have flipped.



What is a translocation mutation?



What is a translocation mutation?

Where a group of nucleotides (bases) become separated from the DNA sequence, and are then inserted into the DNA of a different chromosome.



Which mutations are most likely to have a significant impact and why?



Which mutations are most likely to have a significant impact and why?

Insertion, deletion, duplication, translocation. Because they produce a frameshift, meaning the entire amino acid sequence produced will be different.



Which mutations are less likely to have a significant impact and why?



Which mutations are most likely to have a smaller impact and why?

Substitution, inversion. Because they only alter one or very few triplets, the amino acid sequence might not be affected due to the degenerate nature of the genetic code.



Is a mutation resulting in a change to the amino acid sequence always harmful?



Is a mutation resulting in a change to the amino acid sequence always harmful?

No; may be neutral if the resulting change in protein has no effect on the organism.

Also may be beneficial, which is the basis for evolution and natural selection.



What is a mutagenic agent? Give examples of this.



What is a mutagenic agent? Give examples of this.

Factors that increase the rate of gene mutation. Chemical mutagens such as alcohol and benzene. Ionising radiation such as UV and x-ray.

