

Edexcel Biology GCSE

Topics 3.20 to 3.23 - Variation and the
human genome project

Flashcards

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What are the two causes of variation within a species?



What are the two causes of variation within a species?

- Genetics
- Environment



What is genetic variation?



What is genetic variation?

- Variations in the genotypes of organisms of the same species due to the presence of different alleles
- Creates differences in phenotypes



What creates genetic variation in a species?



What creates genetic variation in a species?

- Spontaneous mutations
- Sexual reproduction



What is a mutation?



What is a mutation?

A random change to the base sequence in DNA which results in genetic variants



State the three types of gene mutation



State the three types of gene mutation

- Insertion
- Deletion
- Substitution



How may a gene mutation affect an organism's phenotype? (3)



How may a gene mutation affect an organism's phenotype? (3)

- Neutral mutation does not change the sequence of amino acids. Protein structure and function same. No effect on phenotype.
- Mutation may cause a minor change in an organism's phenotype e.g. change in eye colour.
- Mutation may completely change the sequence of amino acids. This may result in a non-functional protein. Severe changes to phenotype.



What is environmental variation?



What is environmental variation?

- Variations in phenotype that are acquired during the lifespan of an organism
- Due to environmental factors e.g. diet, lifestyle, climate, exposure to light etc.



What is the Human Genome Project?



What is the Human Genome Project?

- Scientific research project involving thousands of scientists across the globe which successfully mapped the entire human genome
- Scientists now aim to identify the function of every gene in the human genome



How can the results of the Human Genome Project be applied to medicine?



How can the results of the Human Genome Project be applied to medicine?

- Enables scientists to understand how lifestyle factors interact with genes - identifying predisposition to disease and possible preventions
- Disease-causing alleles identified more rapidly and the appropriate treatments prescribed earlier on
- Scientists can predict an individual's response to certain drugs. New drugs can be developed which are tailored to a specific allele.



What are drawbacks associated with the discoveries of the Human Genome Project?



What are drawbacks associated with the discoveries of the Human Genome Project?

- Knowledge of predisposition to a disease can be stressful
- Societal pressure influencing the decision to have children
- Discrimination by employers, insurance firms etc.

