

OCR (B) Biology GCSE

Topic B1.3: How can and should gene technology be used?

Flashcards

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Outline how genetic testing can be used to improve healthcare (3)



Outline how genetic testing can be used to improve healthcare (3)

- Enables awareness of potential risks and the introduction of lifestyle changes to reduce these associated risks
- Enables early treatment plans to begin
- Prediction of a patient's reaction to certain drugs - 'personalised medicine'



Outline the drawbacks of using genetic testing in healthcare (2)



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- Discrimination by employers, insurance firms etc. if a person is likely to develop a disease
- Person may develop anxiety, depression etc.



Outline how genetic testing can be used in family planning (3)



Outline how genetic testing can be used in family planning (3)

- Parental carrier testing - parents tested for the presence of recessive disease-causing alleles
- Prenatal testing - egg fertilised *In vitro*, embryo tested for genetic disorders
- Fetus tested for genetic disorders via amniocentesis or chorionic villus sampling (CVS)



Outline the drawbacks of using genetic testing in family planning (4)



Outline the drawbacks of using genetic testing in family planning (4)

- False-positive/false-negatives
- Ethical considerations - involves the destruction of embryos and potential terminations
- Amniocentesis and CVS carry a slight risk of miscarriage
- Could lead to 'designer babies'



What is genetic engineering?



What is genetic engineering?

- The changing of the genome of an organism by the insertion of a desired gene from another organism
- Enables the formation of an organism with beneficial characteristics



Describe the process of genetic
engineering (higher)



Describe the process of genetic engineering (higher)

1. Desired gene isolated using enzymes
2. Gene replicated
3. Gene placed into vector (e.g. plasmid, virus)
4. Vector mixed with and 'taken up' by target cells
5. Modified cells identified, selected and cultured



Describe the benefits of genetic engineering (3)



Describe the benefits of genetic engineering (3)

- Increased crop yields for growing population e.g. herbicide-resistance, disease-resistance
- Useful in medicine e.g. insulin-producing bacteria, antithrombin in goat milk
- GM crops produce scarce resources e.g. GM golden rice produces beta-carotene (source of vitamin A in the body)



Describe the risks of genetic engineering (3)



Describe the risks of genetic engineering (3)

- Long-term effects of consumption of GM crops unknown
- Negative environmental impacts e.g. reduction in biodiversity, impact on food chain, contamination of non-GM crops forming 'superweeds'
- Late-onset health problems in GM animals

