

GCSE Biology A (Gateway)

J247/04 Biology A B4-B6 and B7 (Higher Tier)

Question Set: 4

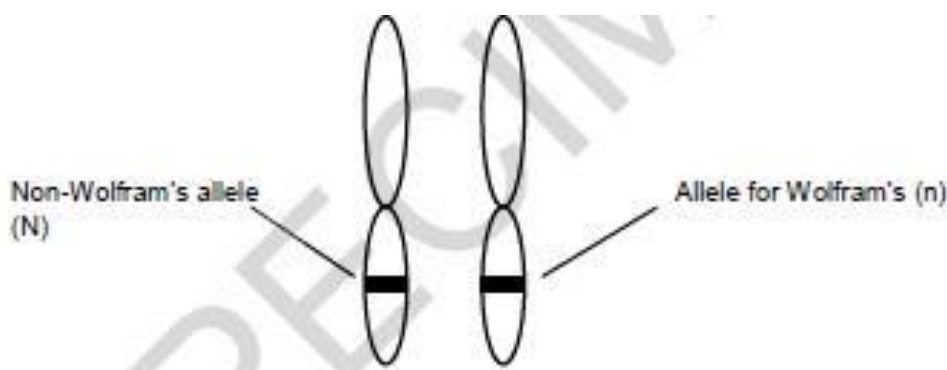
1 Wolfram's Syndrome is a genetic disorder. It is caused by a recessive allele (n).

In people with Wolfram's syndrome, a protein does not function correctly.

(a) Explain how a change in an allele can stop a protein functioning correctly.

This can change the base sequence of DNA and therefore amino acids. This then produces a protein with a different shape which is no longer suited to the desired function. [4]

(b) The diagram shows a pair of chromosomes from a person called Tim.



Fill in the table to show Tim's genotype and phenotype.

Choose your answers from this list.

does not have Wolfram's syndrome

has Wolfram's syndrome

heterozygous

homozygous dominant

homozygous recessive

genotype	Heterozygous
phenotype	Does not have Wolfram's syndrome.

[2]

(c) (i) Meena is expecting a baby. Tim is the father.

Complete this genetic diagram.

		Tim	
		N	n
Meena	N	NN	Nn
	n	Nn	nn

[2]

(ii) Wolfram's syndrome can affect the pancreas.

Meena and Tim's doctor tells them that there is a chance that their baby will have problems controlling their blood glucose level.

Explain why the doctor thinks this.

Use information from part (c) (i) and your biological knowledge.

Baby may be nn so can have a 1/4 chance of being affected
The babies' pancreas will then not produce enough insulin
to be able to control its blood glucose level.

[4]

Total Marks for Question Set 4: 12

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