

**GCSE Biology B (Twenty First Century Science)**  
**J257/03 Breadth in Biology (Higher)**

**Question Set 8**

1

Amaya reads an article in a magazine which explains that genes code for the production of a taste receptor on the tongue.

Taste receptors are proteins.

- (a) Complete the sentences to describe how a protein is made. Use words from the list.

Each word can be used once, more than once, or not at all.

**amino acids      bases      DNA      fatty acids      gene**  
**genetic variant      mitochondrion      mRNA      protein      ribosome**

A copy of the ..... *gene* ..... is made from ..... *mRNA* .....

This molecule travels to ..... *ribosome* ..... in the cytoplasm.

Here ..... *amino acids* ..... are joined together to form a protein.

A mutation would create a ..... *genetic variant* ..... and therefore a different receptor.

[4]

- (b) Scientists think that a mutation created the type of receptor that allows someone to taste a bitter substance.

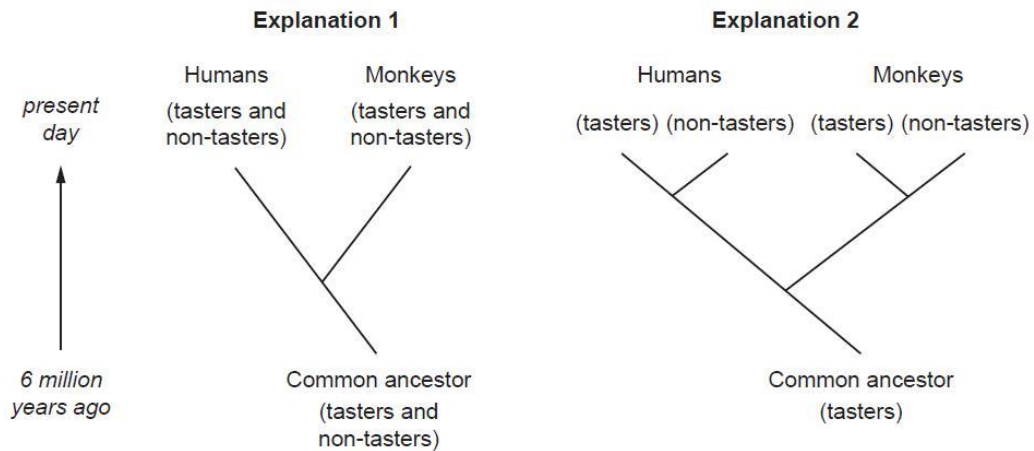
Explain how a mutation could affect the structure of the receptor protein.

[2]

*Changes base sequence in DNA which would give rise to different sequence of amino acids. This would create a different protein with a different function.*

- (c) Monkeys also have different variants of the gene that affects how they taste bitterness.

Scientists have proposed two explanations for how the non-tasting variants could have evolved in humans and monkeys.



Scientists have discovered that the non-tasting variants in humans and monkeys have different DNA sequences, even though they have the same effect.

Which explanation of how they evolved is most likely to be correct?

Explain your answer.

Cannot tell because not clear how different the DNA sequences are. The non-tasting variants could have mutated further. [2]

**Total Marks for Question Set 8: 8**

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