

GCSE Biology A (Gateway)

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

Question Set: 20

1

Some people get very painful headaches called migraines.

Scientists think that this is caused by a protein in the brain called CGRP.

Levels of the CGRP protein are higher in the brains of people who get migraines.

Doctors are trying to find a treatment to prevent migraines.

They have produced an antibody against the CGRP protein.

(a) Describe how antibodies are usually made in the human body.

[2]

(b)

The doctors test the antibody treatment on migraine patients.

The patients are divided into two groups:

- One group is given an injection of the antibody
- The second group receives an injection of a placebo.
- They record the mean number of days each patient had migraines before and after treatment.

The table shows their results.

Treatment	Mean number of migraine days per patient before treatment	Mean number of migraine days per patient after treatment	Percentage decrease in migraine days perpatient
antibody injection	9.1	4.4	
placebo	9.1	6.4	29.7

(i) Explain why a placebo group is used in drug testing.

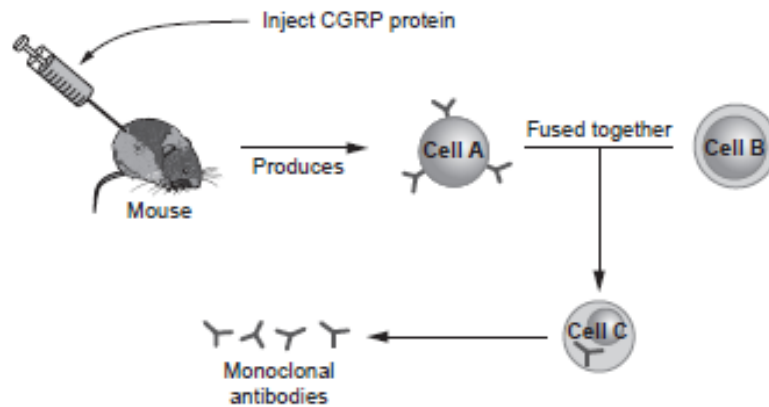
[3]

(ii) Calculate the percentage decrease in migraine days in the patients that had the antibody injection.

Give your answer to 1 decimal place.

[3]

- (c) The antibodies used in the investigation were monoclonal antibodies. They can be made by injecting CGRP protein into a mouse. The diagram shows this process.



Draw lines to identify each type of cell shown in the diagram.

Cell A	Cancer cell
Cell B	Lymphocyte
Cell C	Hybridoma

[2]

Total Marks for Question Set 20: 10

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