

GCSE Biology A (Gateway)

J247/02 B4-B6 and B7 Foundation (Foundation Tier)

Question Set 19

1

Some people get very painful headaches called migraines. Scientists think that these are 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) Complete these sentences to describe how **antibodies** are made in the body.

Use words from the list.

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

antibiotics **antigens** **antivirals**
platelets **red blood cells** **white blood cells**

Foreign cells have chemical groups on their surface called

..... antigen

These chemical groups are detected by white blood cells which then produce antibodies.

[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 which does not contain the antibody.

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 perpatient before treatment	Mean number of migraine days perpatient after treatment	Percentage decrease in migraine days perpatient
antibody injection	9.1	4.4	51.6
placebo	9.1	6.4	29.7

- (i) The placebo group does **not** receive the antibody.

Suggest why this group is included in the study.

[1]

as a control group

- (ii) The total number of **migraine days** for the patients on the placebo **after treatment** was 480.

The mean number of migraine days per patient after treatment was 6.4.

Calculate the number of patients in the placebo group.

Number of patients = 75

[2]

$$\frac{480}{x} = 6.4$$

$$x = \frac{480}{6.4} = 75$$

- (c) Explain why it is important that a second group of doctors should repeat this test.

[2]

to show the results are **reliable, not biased**
reproducible and not
due to chance - they must be peer assessed.

Total Marks for Question Set 19: 7

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