

GCSE Biology A (Gateway)

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

Question Set 4

1 Different parts of the body have natural defence mechanisms to stop pathogens infecting the body.

These defences include:

- skin
- tears
- secretions from the stomach.

(a) Describe how each defence stops pathogens infecting the body.

Skin forms a ^{physical} barrier.

[4]

Enzymes in tears breaks down bacterial cell walls killing bacteria.

Acid in the stomach kill pathogens by breaking them down.

Hydrochloric (pH 2 is too acidic for pathogens to survive.)

(b) Sometimes the defence mechanisms do not work and pathogens enter the body. The pathogens may then be treated with antibiotics. What is an antibiotic?

A chemical made using fungi or microbes that kill other microbes and bacteria, but not viruses. [2]

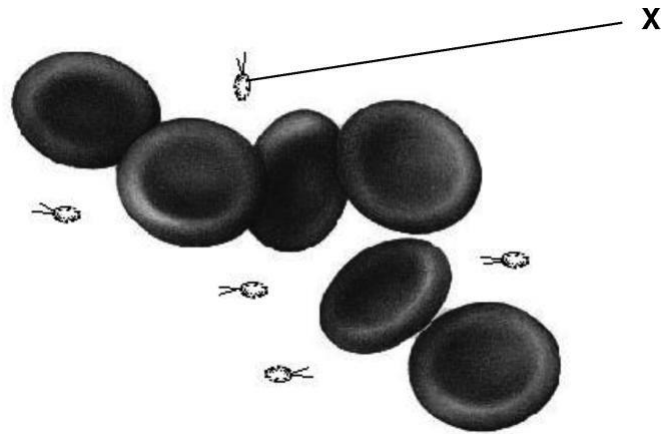
(c) A student is ill and is having tests in hospital. His doctors monitor his body temperature frequently.

Explain why it is important to monitor his body temperature frequently.

The body temperature acts as a sign to how severe the disease is. If it is far from the normal it can be dangerous to life. [2]

- (d) The doctors took a sample of blood from the student. They looked at the specimen under a light microscope.

This is a picture of what they saw.



From this picture, the doctors decide that the student's illness is caused by bacteria (labelled X).

- (i) Why do the doctors **not** think that the structures labelled X are viruses?

[1]

Too big to be a virus.

- (ii) What equipment could the doctors use to get a clearer image to confirm their ideas?

[1]

Electron microscope

- (e) (i) The student's doctors want to check that the bacteria causing his illness are not resistant to the antibiotic erythromycin.

This is the method they use:

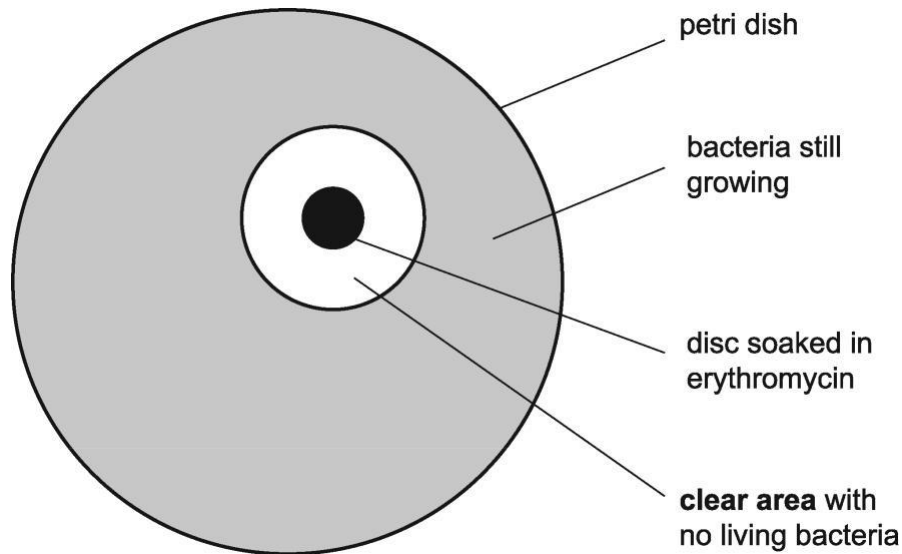
1. A petri dish is made that has the bacteria growing evenly over the surface of agar.
2. A disc of filter paper is soaked in erythromycin.
3. The disc is placed on the agar in the centre of the petri dish.
4. The lid of the dish is fixed on with a piece of tape.
5. The dish is then incubated.

Why did the doctors tape the lid on the petri dish?

To prevent other people from taking in the microbe

[1]

(ii) The diagram shows the doctor's results.



Use a ruler to measure the diameter of the **clear area** in mm.

Using this diameter, calculate the area of the circle where there are no living bacteria.

- The area of a circle = πr^2 and $\pi = 3.14$

Diameter = 24 mm radius = 12 mm

$3.14 \times (12)^2 = 452.16$

Answer = 452 mm²

[3]

(iii) This table is used to analyse the results of the experiment.

Area clear of bacteria including the area of the disc (mm ²)	Level of resistance
less than 133	resistant
133 to 416	intermediate resistance
more than 416	not resistant

Use your result from part (ii) to judge the level of resistance in the microbe. [1]

not resistant

Total Marks for Question Set 4: 15

OCR
Oxford Cambridge and RSA

Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge