

AQA – Cells – AS Biology P11. **May/2020/Paper_1/No.2**

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 Explain the arrangement of phospholipids in a cell-surface membrane.**[2 marks]**

0	2	.	2
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 Describe how an ester bond is formed in a phospholipid molecule.**[2 marks]**

0	2	.	3
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 State and explain the property of water that helps to prevent temperature increase in a cell.**[2 marks]**

Property _____

Explanation _____

2. May/2020/Paper_1/No.3

03.1

Describe how a phagocyte destroys a pathogen present in the blood.

[3 marks]

03.2

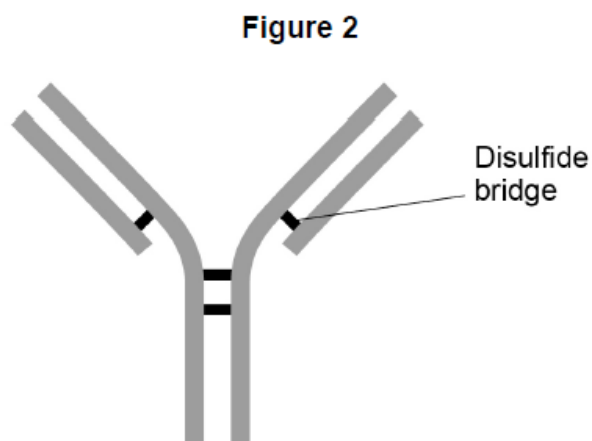
Give two types of cell, other than pathogens, that can stimulate an immune response.

[2 marks]

1 _____

2 _____

0 3 . 3 Figure 2 shows the structure of an antibody.



Label **Figure 2** with an **X** to show where an antigen-antibody complex forms.

[1 mark]

0 3 . 4 A disulfide bridge is labelled in **Figure 2**.

What is the role of the disulfide bridge in forming the quaternary structure of an antibody?

[1 mark]

3. May/2020/Paper_1/No.7

07.1

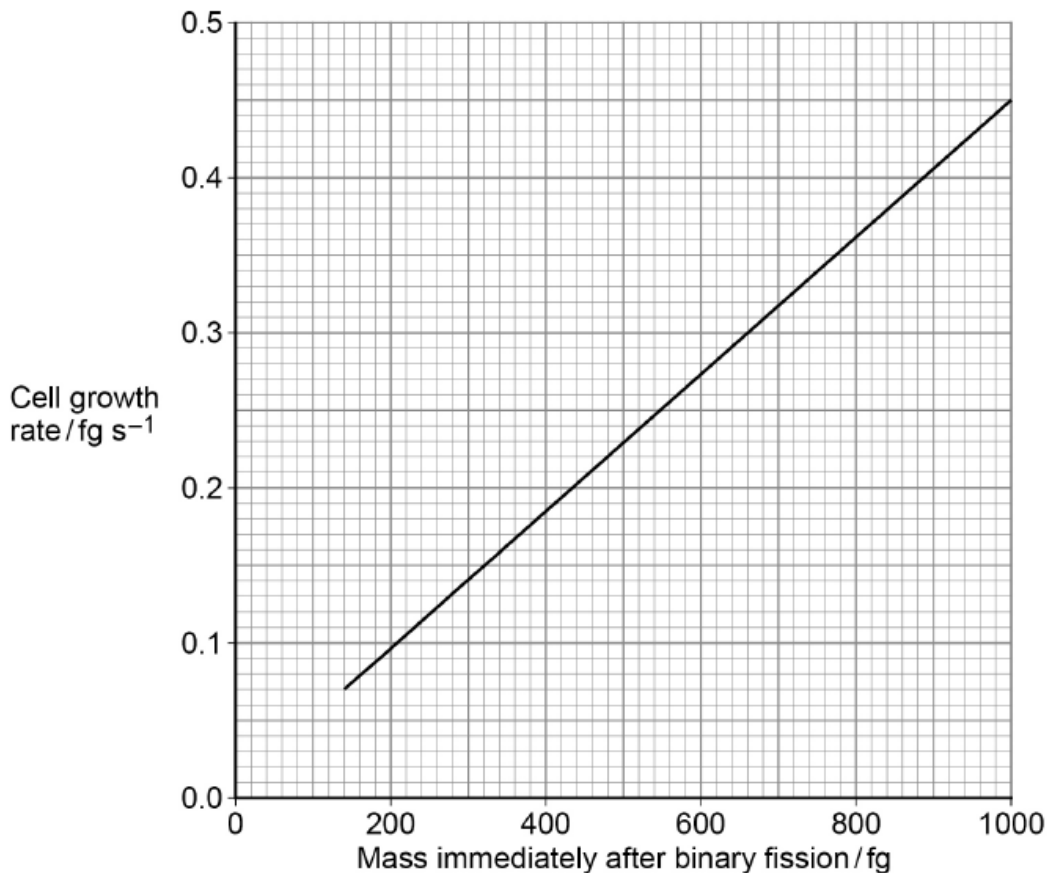
Describe binary fission in bacteria.

[3 marks]

The cell growth rate of the bacterium *Bacillus subtilis* is proportional to its mass immediately after binary fission.

Figure 7 shows this relationship.

Figure 7



0 7 . 2

The mass of the bacterial cells was measured in femtograms (fg).

$$1 \text{ fg (femtogram)} = 1 \times 10^{-15} \text{ g}$$

Place a tick (✓) in the box next to the number that is equal to 680 fg

[1 mark]

0.000 000 000 006 8 g

$6.8 \times 10^{-13} \text{ g}$

$6.8 \times 10^{-15} \text{ g}$

$6.8 \times 10^{-17} \text{ g}$

A scientist determined the growth rate of a *B. subtilis* cell by measuring its mass for 5 minutes.

In those 5 minutes, the cell's mass increased by 90 fg

0 7 . 3 Use this information and **Figure 7** to determine the mass of this cell immediately after binary fission.

Show your working.

[2 marks]

Answer _____ fg

0 7 . 4 Suggest and explain how **two** environmental variables could be changed to increase the growth rate of these cells.

[4 marks]

Suggestion 1 _____

Explanation _____

Suggestion 2 _____

Explanation _____

4. May/2019/Paper_1/No.2

0 2 . 1 What is a **monoclonal** antibody?

[1 mark]

0 2 . 2 After a disease is diagnosed, monoclonal antibodies are used in some medical treatments.

Give **one** example of using monoclonal antibodies in a medical treatment.

[1 mark]

0 2 . 3 Describe the role of antibodies in producing a positive result in an ELISA test.

[4 marks]

5. May/2019/Paper_1/No.5

0 5 . 1

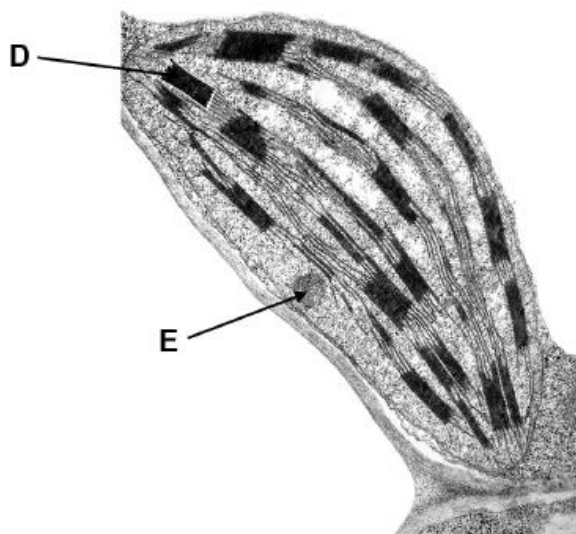
Place a tick (✓) in the box next to the sequence that shows the correct order of magnitude of these measurements.

[1 mark]

50 nm < 0.5 μm < 5 × 10⁻² mm < 0.5 × 10⁻⁵ m 50 nm < 0.5 μm < 0.5 × 10⁻⁵ m < 5 × 10⁻² mm 0.5 μm < 50 nm < 0.5 × 10⁻⁵ m < 5 × 10⁻² mm 0.5 μm < 50 nm < 5 × 10⁻² mm < 0.5 × 10⁻⁵ m

Figure 3 is an electron micrograph of a chloroplast.

Figure 3



0 5 . 2

Identify structures labelled **D** and **E**.

[2 marks]

D _____

E _____

0 5 . 3 The detail shown in **Figure 3** would **not** be seen using an optical microscope.

Explain why.

[2 marks]

0 5 . 4 Name an organelle found in both a chloroplast and a prokaryotic cell.

[1 mark]

0 5 . 5 A scientist determined the volume of a plant cell and the volume of organelles it contained.

They found:

- the volume of a plant cell is $17\,500\ \mu\text{m}^3$
- the volume of all the mitochondria in a plant cell is $262.5\ \mu\text{m}^3$
- the volume of all the mitochondria and all the chloroplasts in a plant cell is 44.1% of the volume of a plant cell.

Use this information to calculate the volume of all the chloroplasts in a plant cell.

[2 marks]

Answer = _____ μm^3

0 5 . 6

A biologist separated cell components to investigate organelle activity. She prepared a suspension of the organelles in a solution that prevented damage to the organelles.

Describe **three** properties of this solution and explain how each property prevented damage to the organelles.

[3 marks]

Property 1 _____

Explanation

Property 2 _____

Explanation

Property 3 _____

Explanation
