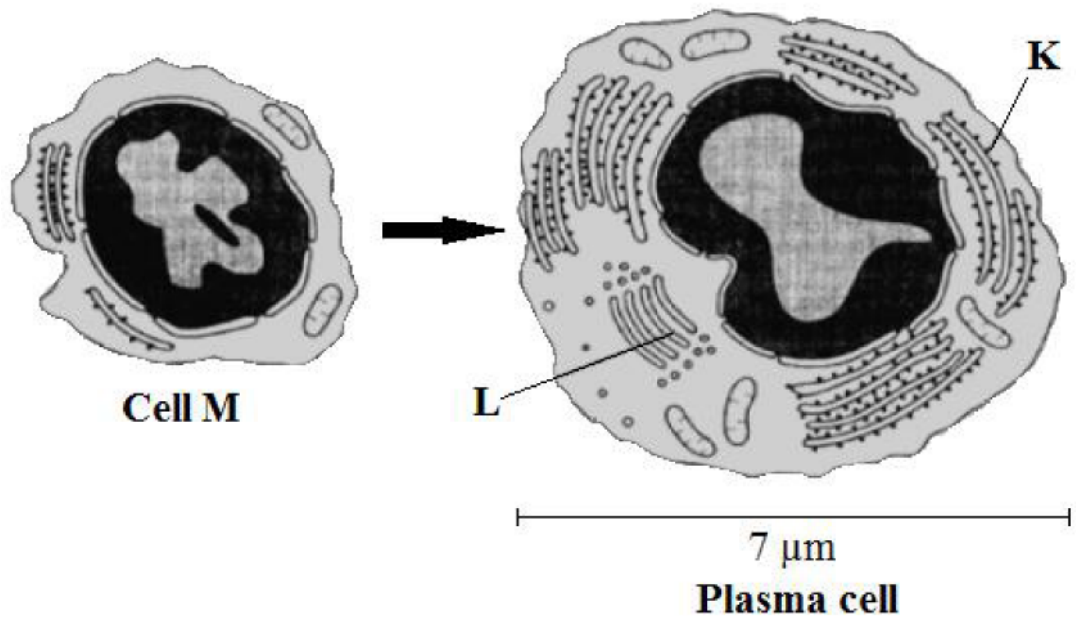


1. In Fig. 8.1, Cell M is a leucocyte, which differentiates to become the plasma cell.



**Fig. 8.1**

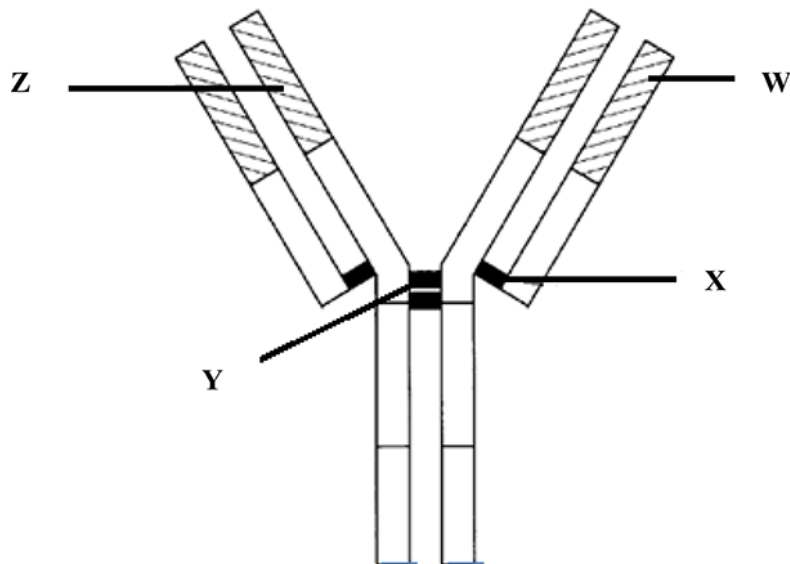
Which of the following responses correctly describes Cell M and the structures in the plasma cell?

- A Cell M is a T lymphocyte and antibodies are synthesized on structure K.
- B Cell M is a T lymphocyte and antibodies are synthesized on structure L.
- C Cell M is a B lymphocyte and antibodies are synthesized on structure K.
- D Cell M is a B lymphocyte and antibodies are synthesized on structure L.

Your answer

[1]

2. Fig. 9.1 is a diagram of an antibody molecule.



**Fig. 9.1**

Which one of the following statements is correct?

- A Region W is the variable region of the heavy chain and X is in the hinge region.
- B Region W is the constant region of the light chain and X is a disulfide bond.
- C Region Z is the variable region of the heavy chain and Y is in the hinge region.
- D Region Z is the constant region of the light chain and Y is a disulfide bond.

Your answer

[1]

3. The gene, *FOXP3*, encodes a transcription factor that drives the differentiation of immature T cells into a specific cell type.

Mutations in *FOXP3* can interrupt the function of the transcription factor and lead to autoimmunity.

Which of the options, **A** to **D**, is the T cell type driven by this transcription factor?

- A T helper cell
- B T killer cell
- C T memory cell
- D T regulatory cell

Your answer

[1]

4. A person can be immunised against some diseases by injecting them with antibodies extracted from another person or from an animal.

Which of the options, **A** to **D**, correctly describes this type of immunity?

- A artificial active
- B artificial passive
- C natural active
- D natural passive

Your answer

[1]

5. Phosphatidylserine is a type of phospholipid found in some cell membranes. Phosphatidylserine has a role in the process of apoptosis.

Which of the options, **A** to **D**, describes the role of phosphatidylserine in the apoptosis of a damaged cell?

- A Binds to receptors on the plasma (cell surface) membrane of the damaged cell to allow formation of blebs.
- B Binds to receptors on the plasma (cell surface) membranes of macrophages to allow phagocytosis of apoptotic vesicles.
- C Binds to receptors on the plasma (cell surface) membranes of macrophages to allow formation of apoptotic vesicles.
- D Binds to receptors on the nuclear envelope of the damaged cell to allow breakdown of the nucleus.

Your answer

[1]

6. An allergic reaction involves a series of events that are mediated by the immune system.

Which of the options, **A** to **D**, is a result of **initial** exposure to an allergenic antigen?

- A activation of complement
- B division of mast cells
- C presentation of antigen
- D release of histamine

Your answer

[1]

7. Which of the options, **A** to **D**, could provide artificial **and** passive immunity to a baby?

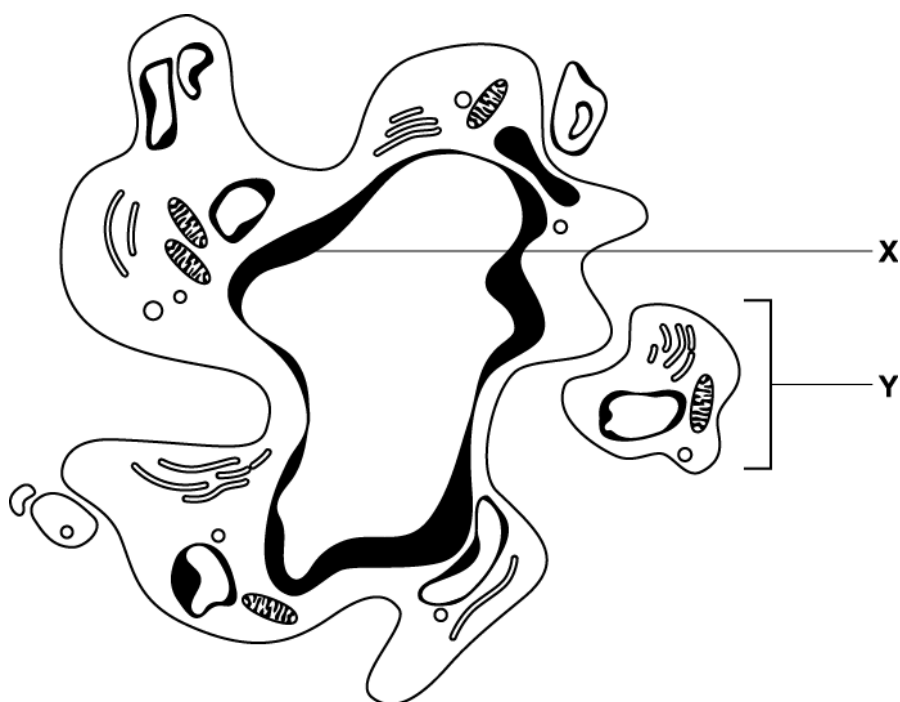
- A injection of antibodies from another individual
- B injection of a pathogen that has been weakened
- C passage of maternal antibodies across the placenta
- D production of antibodies following an infection

Your answer

[1]

8. The diagram below shows a cell in a late stage of apoptosis.

Two features are labelled X and Y.



Which of the following statements is/are correct?

- 1 X is a complex of DNA and protein.
- 2 Phosphatidylserine is present on the surface of Y.
- 3 The contents of Y are digested in a lysosome.

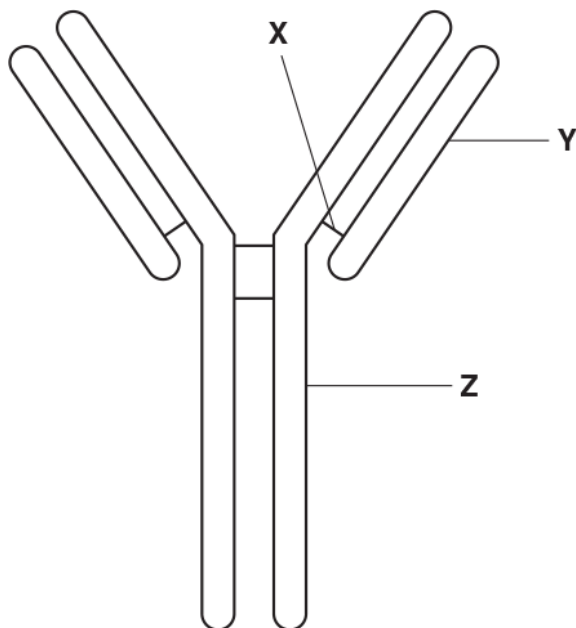
- A 1, 2 and 3 are correct
- B Only 1 and 2 are correct
- C Only 2 and 3 are correct
- D Only 1 is correct

Your answer

[1]

9. The general structure of an antibody is shown below.

Three features are labelled X, Y and Z.



Which of the statements, A to D, is correct?

- A X is a disulfide bond that connects the constant region of Y and the variable region of Z.
- B X is a disulfide bond that connects the constant regions of Y and Z.
- C X is a hydrogen bond that connects the constant region of Y and the variable region of Z.
- D X is an ionic bond that connects the constant regions of Y and Z.

Your answer

[1]

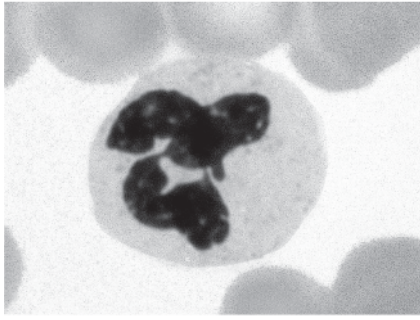
10. Which of the options, A to D, is a primary defence mechanism against pathogens?

- A antibody molecules
- B the HPV vaccine
- C lysozyme, an enzyme found in saliva and tears
- D penicillin, an antibiotic

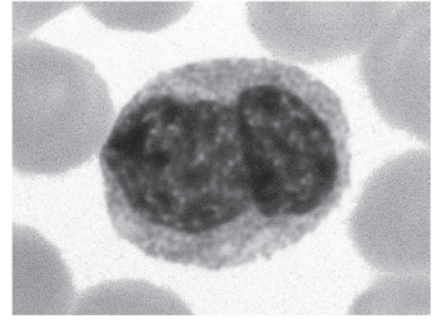
Your answer

[1]

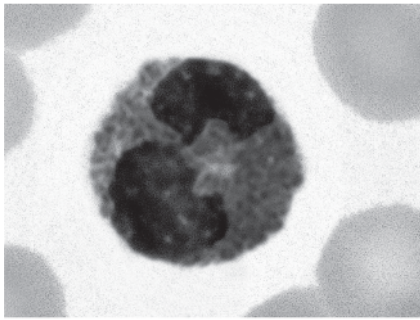
11. The photomicrographs show different types of leucocyte (white blood cell).



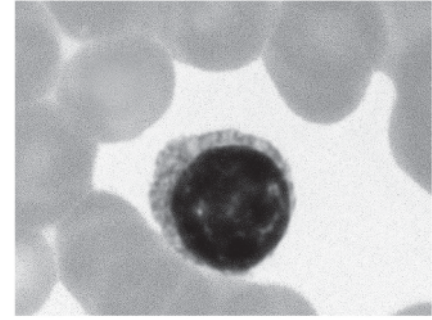
**leucocyte A**



**leucocyte B**



**leucocyte C**



**leucocyte D**

Which of the leucocytes, A to D, can differentiate into a plasma cell during the specific immune response?

Your answer

[1]

**END OF QUESTION PAPER**



### Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
1			C	1	
			Total	1	
2			C	1	
			Total	1	
3			D	1	
			Total	1	
4			B	1	<p><b>Examiner's Comments</b></p> <p>This question was basic recall and had straightforward options with just the four types of immunity to choose from. However, the correct response was only achieved by just over 50% of candidates.</p>
			Total	1	
5			B	1	<p><b>Examiner's Comments</b></p> <p>This question proved challenging for some and required careful reading to choose the most appropriate response for the role of phosphatidylserine in apoptosis.</p>
			Total	1	
6			C ✓	1	
			Total	1	
7			A ✓	1	
			Total	1	
8			A ✓	1	
			Total	1	
9			B ✓	1	<p><b>Examiner's Comments</b></p> <p>Most candidates could identify the disulfide bonds on the antibody but some confused the constant and variable regions, thus A was a common incorrect answer.</p>
			Total	1	

### Mark Scheme

Question			Answer/Indicative content	Marks	Guidance
10			C	1	<b>Examiner's Comments</b> The majority of candidates chose the correct option for this question.
			<b>Total</b>	<b>1</b>	
11			D	1	<b>Examiner's Comments</b>  Whilst the recognition of leucocytes using images proved challenging for some candidates, higher ability candidates were able to correctly identify leucocyte D as the lymphocyte; distinguishing it from the other cells by the shape of the nucleus and the size of the cell.
			<b>Total</b>	<b>1</b>	