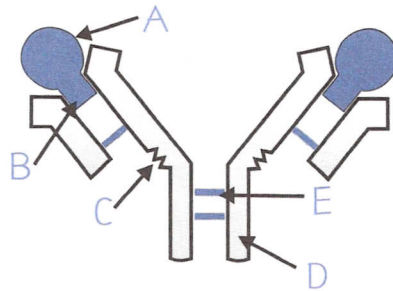


The Immune System

Q1 What is an **antigen**?

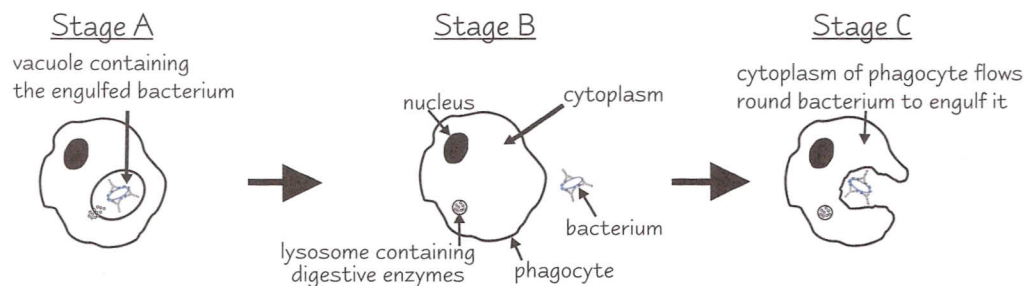
Q2 **Lymphocytes** and **antibodies** are two important components of the body's immune system.

- Describe how the **immune system** identifies foreign pathogens from native body cells.
- Explain what is meant by an **antigen-antibody** complex.
- What is a **pathogen**?
- The diagram below represents an antibody.
Copy the diagram, replacing **A – E** with the correct labels from the box.



disulfide bridge	antigen	hinge protein
antigen binding site		protein chain

Q3 The diagrams below show the stages involved when a **phagocyte** interacts with a **pathogen**. They are **not** in the correct order.



- Write down the letters of the stages in the **correct order**.
- What is the function of the **lysosome**?
- Where** are phagocytes made?

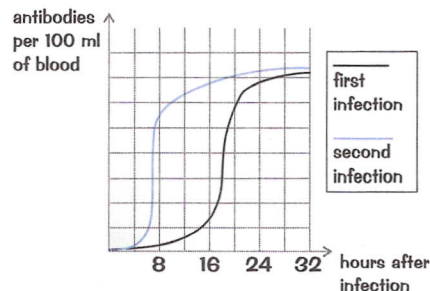
The Immune System

- Q4 The article below describes one method the body has of **defending** itself from attack by microorganisms.

Lymphocytes can attach to the antigens on foreign cells and kill the pathogen by attacking it directly. These cells recognize antigens that might invade the body in the future. They also stop the action of other white blood cells once the pathogen has been destroyed.

- a) What is the **name** of the response described above?
 b) The **humoral response** also involves lymphocytes.
Explain how the humoral response attacks pathogens.

- Q5 A person is infected by a pathogen and their antibody levels are recorded. Next year the person is infected with the same pathogen. Again, antibody levels are recorded. The graph below shows antibody levels during the two infections.



- a) Does the person get **as ill** following the second infection as they do following the first infection?
 b) Why are the levels of antibody in the blood **so much higher** 8 hours after the second infection, than they were 8 hours after the first infection?
- Q6 The "flu jab" is a vaccination against the influenza virus.
- a) **What** is injected into the body in this vaccination?
 b) How does the body **react** to this?
 c) How does this **prevent** the vaccinated person from becoming ill with flu?
 d) The influenza virus changes and mutates each year.
Explain why the "flu jab" **does not give** lifelong protection against influenza.

White blood cells lead the fight against disease...

Two more diagrams and lots of fancy words for you to learn here. It might take a while to get the hang of the different immune responses, but keep going until you can describe all the ways in which white blood cells help us fight disease. Don't forget immunization — make sure you know exactly how it works.