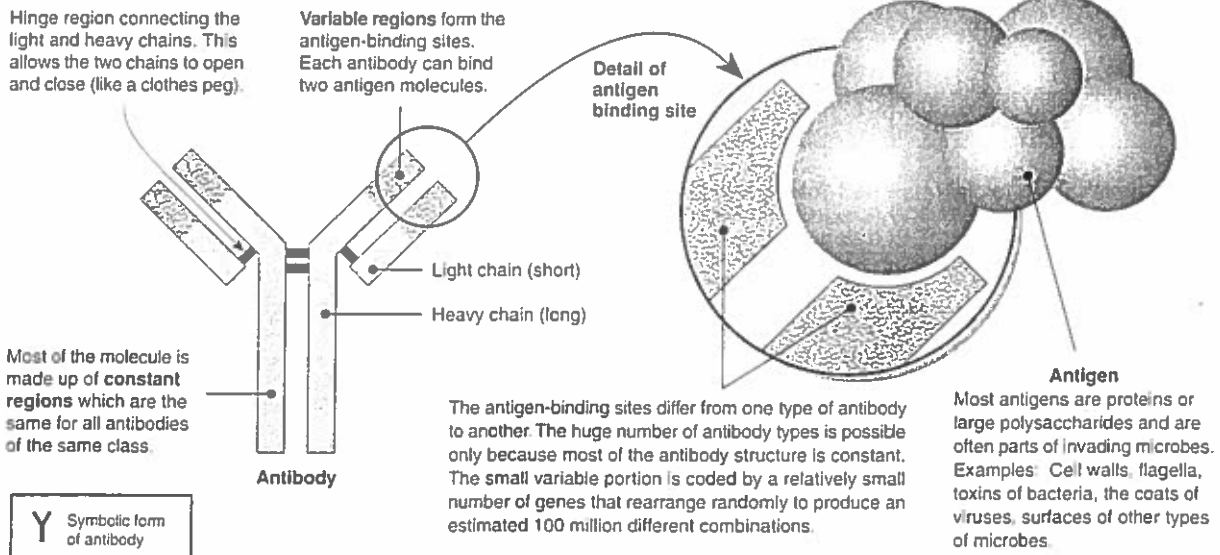


Antibodies

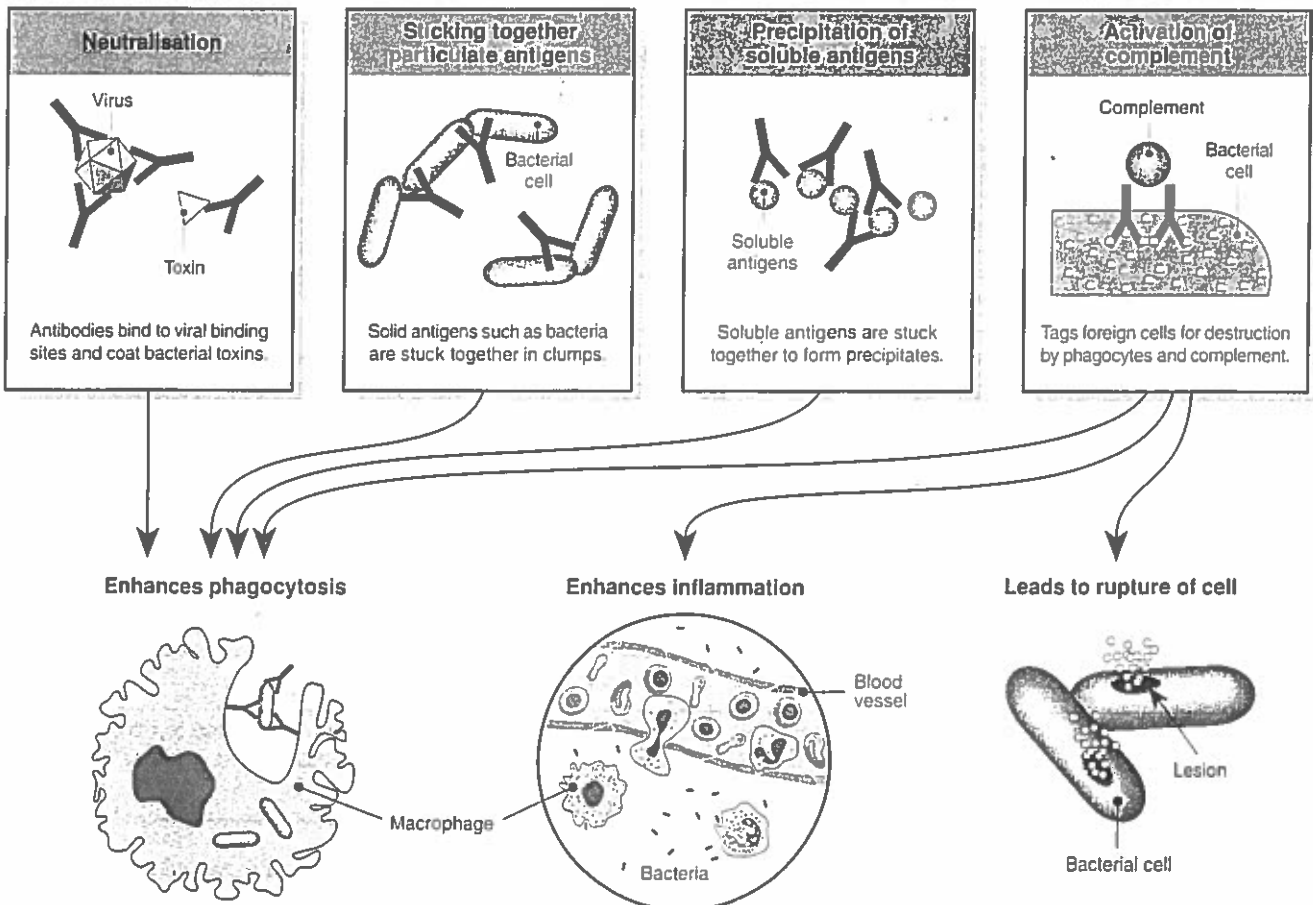
Antibodies and antigens play key roles in the response of the immune system. Antigens are foreign molecules that are able to bind to antibodies (or T cell receptors) and provoke a specific immune response. Antigens include potentially damaging microbes and their toxins (see below) as well as substances such as pollen grains, blood cell surface molecules, and the surface proteins on transplanted tissues. **Antibodies** (also called immunoglobulins) are proteins that are made in response to antigens. They are secreted into the plasma where they circulate and can recognise, bind to, and help to destroy antigens. There are 5 classes of immunoglobulins. Each plays a different

role in the immune response (including destroying protozoan parasites, enhancing phagocytosis, protecting mucous surfaces, and neutralising toxins and viruses). The human body can produce an estimated 100 million antibodies, recognising many different antigens, including those it has never encountered. Each type of antibody is highly specific to only one particular antigen. The ability of the immune system to recognise and ignore the antigenic properties of its own tissues occurs early in development and is called **self-tolerance**. Exceptions occur when the immune system malfunctions and the body attacks its own tissues, causing an **autoimmune disorder**.



Defence & the Immune System

How Antibodies Inactivate Antigens



1. Distinguish between an antibody and an antigen: _____

2. It is necessary for the immune system to clearly distinguish cells and proteins made by the body, from foreign ones.
(a) Explain why this is the case: _____

(b) In simple terms, explain how **self tolerance** develops (see the activity "The Immune System" if you need help):

(c) Name the type of disorder that results when this recognition system fails: _____
(d) Describe two examples of disorders that are caused in this way, identifying what happens in each case:

3. Discuss the ways in which antibodies work to inactivate antigens: _____

4. Explain how antibody activity enhances or leads to:
(a) Phagocytosis: _____

(b) Inflammation: _____

(c) Bacterial cell lysis: _____
