**THE ANTIBODY MOLECULE**
Antibodies are proteins that bind very tightly to their targets (antigens). They are produced in vertebrates as a defense against infection. Each antibody molecule is made of two identical light chains and two identical heavy chains, so the two antigen-binding sites are identical.

**ANTIBODY SPECIFICITY**
An individual animal can make billions of different antibody molecules, each with a distinct antigen-binding site. Each antibody recognizes its antigen with great specificity.

**B CELLS**
Antibodies are made by a class of white blood cells, called B lymphocytes, or B cells. Each resting B cell carries a different membrane-bound antibody molecule on its surface that serves as a receptor for recognizing a specific antigen. When antigen binds to this receptor, the B cell is stimulated to divide and to secrete large amounts of the same antibody in a soluble form.

**RAISING ANTIBODIES IN ANIMALS**
Antibodies can be made in the laboratory by injecting an animal (usually a mouse, rabbit, sheep, or goat) with antigen A.

1. Inject antigen A
2. Take blood later

Repeated injections of the same antigen at intervals of several weeks stimulates specific B cells to secrete large amounts of anti-A antibodies into the bloodstream.

**ANTIBODIES DEFEND US AGAINST INFECTION**
- foreign molecules
- viruses
- bacteria

Antibodies form aggregates with antibody and antigen aggregates being ingested by phagocytic cells. Special proteins in blood kill antibody-coated bacteria or viruses.

Because many different B cells are stimulated by antigen A, the blood will contain a variety of anti-A antibodies, each of which binds A in a slightly different way.