

Fundamentals

- A *pathogen* is any causative agent of disease
- The immune system recognizes the cells as “self” or “non-self”
 - All body cells have a common set of plasma membrane proteins and these are recognized as “self”
 - Leucocytes can identify pathogens by detecting glycoproteins on the surface of the pathogen
 - If they don't match with the body's own cells, they're referred to as *antigens* (“non-self” molecules)
- These plasma proteins determine our blood type
 - Everyone has 2 blood types, the *ABO* and the *rhesus* (Rh) blood type
 - The ABO is based on the presence/absence of 2 proteins called *A protein* and *B protein*
 - The Rh is based on the presence/absence of a protein called *Rh protein*
 - Patterns
 - Only the A protein ⇒ type A blood
 - Only the B protein ⇒ type B blood
 - Both the A and B protein ⇒ type AB blood
 - Neither A or B protein ⇒ type O blood
 - Has the Rh protein ⇒ Rh positive
 - Doesn't the Rh protein ⇒ Rh negative

Steps of immune response

- Each type of B lymphocyte (plasma cells) is capable of synthesizing and secreting a specific antibody that binds to a specific antigen
 - Leucocytes represent ~1% of all cells in the blood and they go through cloning when it's needed
- The phagocytic cells macrophages are part of the non-specific response
 - When they detect non-self cells they engulf them
 - The pathogen is partially digested and pieces of it are displayed on the cell's surface, which is called *antigen presentation*
- Other leucocytes called *helper T cells* identify the antigen and become activated
 - The antigen is now known and the immune response becomes specific
- The T cell chemically communicate with the specific B-type lymphocyte that can produce the needed antibody
 - The B-lymphocytes become activated and start to rapidly divide