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Adaptive Immunity

We have learned about the first line of defense (chemical and physical barriers) and the second line of defense (inflammation and complement system). Now we will learn about the third line of defense, which is the internal specific line of defense, also known as adaptive immunity. This line of defense is definitely not as rapid as the non-specific lines mentioned earlier, but it creates a pathogen-specific response. The main players in adaptive immunity are the T-lymphocytes and the B-lymphocytes.

Important Definitions to Know About Immunity:

Some very quick, general, and brief definitions about immunity are given below. It will be important to know the following definitions well.

- **Immunization:** deliberate exposure to antigen or antibody.
- **Active natural immunity:** natural exposure to an antigen. Individuals develop symptoms of disease on first exposure, but not on the second exposure.
- **Active artificial immunity:** deliberate exposure to an antigen by vaccination
- **Passive natural immunity:** transfer of antibodies from a mother to her fetus/baby
- **Passive artificial immunity:** transfer of antibodies (or cells) from an immune individual to a nonimmune one. An example is antiserum, which is available for rabies, hepatitis, and measles as well as toxins formed by bacteria such as tetanus, diphtheria, and botulism. Antiserum can also be used to combat venoms from poisonous snakes and black widow spiders.

To summarize, the key difference between passive and active immunity is the source of the antibodies. Passive immunity is when we are given antibodies instead of producing our own and is almost immediate. Active immunity is slower and is when the body makes its own antibodies. It is the body's direct response to an unknown pathogen.

Lymphoid Tissue
Thymic Selection
Antigens and Antigen Processing
Humoral Immunity
Cell-Mediated Immunity
Type I Hypersensitivity

Type II Hypersensitivity
Type III Hypersensitivity
Type IV Hypersensitivity



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