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Human body and immunology

Freya Taylor*

Department of Biotechnology, University of Glasgow,Glasgow G12 8QQ, UK.

DESCRIPTION

To maintain the integrity of our organism, it is essential to distinguish between biological structures that have to be fought off against everything that poses a danger to our organism and structures that must not be attacked. The branch of science that analyses the structure and function of the immune system is known as immunology, which is primarily developed as a distinctive subject in the mid-20th century. The Human body's defense mechanism that is the immune system makes a distinction between the non-self-organisms and molecules and its own healthy tissues. The dangerous attackers from the worlds of viruses, bacteria and parasites consist of largely the same molecules as the human body, that is why the problem is not so severe.

At the initial evolution stage, simple multicellular organisms developed a protective system that is innate immune system is activated by sensing typical molecular patterns associated with pathogens or distressed cells. This system is conserved and also works in humans. However, the most efficient defense mechanisms, which is the adaptive or acquired immune response. It mounts a custom-made counter-attack against the specific infectious agent invading our organism. Though this mechanism is unable to use for the first day of infection, it can fight against "foreign or non-self " organic material that has entered into the body. This immune mechanism also facilitates non-self and self-recognition. It is further divided into antibody and cell-mediated components. Furthermore, the immune response is highly ignited by antigen which is recognized by lymphocytes cells. Antibodies are specific proteins that are released from a certain class of immune cells known as B lymphocytes, while antigens are the substance that elicits the generation of antibodies. After the completion of the recognition process for antigen, the immune system initiates the secretion of antibodies that neutralize the disease-causing microorganisms. Though the antibodies can't kill the pathogens directly but it helps to identify antigens as targets for destruction by other immune cells such as phagocytes or NK cells. Many components of the immune system are typically cellular in nature and not associated with any specific organ but they are embedded or circulating in various tissues located throughout the body. The important lymphoid organs of the immune system are the thymus, bone marrow, and chief lymphatic tissues such as spleen, lymph vessels, tonsils, lymph nodes, adenoids, and liver.

In the modern era, the research in the field of immunology is of prime interest as, though there are visible implications of the immune system in the infectious diseases such as malaria, dysentery, hepatitis, pneumonia, tuberculosis, and helminth infestations, many common disorders such as metabolic, cardiovascular, cancer, and neurodegenerative conditions like Alzheimer's disease are not substantially viewed as immunologic. Nonetheless, the event of diseases caused by disorders of the immune system particularly the failure, aberrant action, and malignant growth of the cellular elements of the system is studied in clinical immunology. Immunodeficiency and autoimmunity are the main two divisions under which the diseases caused by disorders of the immune system can be realized. For immunodeficiency, parts of the immune system fail to provide an adequate response, on the other hand, the immune system attacks its own host's body for autoimmunity. Immunology has applications in numerous disciplines of medicine, particularly in the fields of organ transplantation, oncology, virology, bacteriology, rheumatology, parasitology, psychiatry, and dermatology.