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Commentary

Brief Note on Immunology

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DESCRIPTION

Immunology is a branch of medical and biological sciences that study the immune system. The immune system protects us from various infections. When it does not function properly, it results in diseases, such as allergy, autoimmunity, and cancer. Advancements in immunology are essential for clinical and commercial applications. Discoveries and diagnostics manage a wide array of diseases. Flow cytometry and antibody technology are new advanced techniques and tools in the field of immunology [1].

The immune system is a complex system that evolved to protect us from diseases. Molecular and cellular components make up the immune system. The first line of defenses in innate immunity and is non-specific that is, the responses are the same for all the pathogens, no matter how different they are. Innate immunity includes physical barriers such as skin, saliva, and cells such as mast cells, basophils, neutrophils, etc. In the first few days of infection, these components protect the organism. In mild cases, first-line defenses are enough to clear the pathogens [2]. Adaptive immunity is the second line defenses, where the cells have the memory of encountered infection and will respond to the foreign substance or a pathogen. In adaptive immunity, antibodies target the foreign pathogens in the bloodstream. T cells are produced by the immune system, which can directly kill the infected cells or help control the antibody response [3].

Our immune system includes organs such as the spleen, bone marrow, lymph nodes, and tonsils. These organs release lymphocytes which are white blood cells. WBC is classified as T cells and B cells. These T and B cells act as antibodies and fight against antigens. B cells detect the specific disease in our body and release antibodies. T cells are for destroying abnormal cells or foreign cells (bacteria, viruses, cancer cells, parasites). When the balance of the immune system is disturbed, the disease can result [4]. Research is going on in this area, which involves studying a disease and immune system dysfunction. There are new developments in the field of immunology such as, therapies and treatments that can cure diseases by altering the way the immune system is working. In the case of vaccines, it boosts the immune reaction to specific pathogens.

Some immunodeficiency disorders prevent our body from fighting infections and diseases. In such conditions, it is easy to catch viruses and bacterial infections. They are either congenital or acquired. A congenital disorder is a primary disorder that is typically present from birth, and they are hereditary and relatively rare. The acquired disorder is a secondary disorder that we get later in life. Acquired disorders are more predominant or common than a congenital disorder. Primary immunodeficiency disorders include common variable immunodeficiency (CVID), X-linked agammaglobulinemia (XLA), and severe combined immunodeficiency (boy in bubble disease) [5]. Secondary immunodeficiency disorders are disorders that we get later as we expose too many toxic chemicals or infections such as radiation, malnutrition, severe burns, etc. They lead to disorders such as multiple myeloma, leukemia, viral hepatitis, etc. Currently, the studies are going on neutralizing antibodies in vaccine designing [6].

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