

Editorial

Immune system and immunology

Tatian Betakova*

Department of Virology, Slovak University, Bratislava, Slovakia.

Accepted 19 May, 2021

EDITORIAL NOTE

Immunology is a branch of biology that covers the study of immune systems in all organisms. Immunology charts, measures, and contextualizes the physiological functioning of the immune system in states of both health and diseases; malfunctions of the immune system in immunological disorders (such as autoimmune diseases, hypersensitivities, immune deficiency, and transplant rejection); and the physical, chemical, and physiological characteristics of the components of the immune system in vitro, in situ, and in vivo. Immunology has applications in numerous disciplines of medicine, particularly in the fields of organ transplantation, oncology, rheumatology, virology, bacteriology, parasitology, psychiatry, and dermatology.

The term was coined by Russian biologist Ilya Ilyich Mechnikov, who advanced studies on immunology and received the Nobel prize for his work in 1908. He pinned small thorns into starfish larvae and noticed unusual cells surrounding the thorns. This was the active response of the body trying to maintain its integrity. It was Mechnikov who first observed the phenomenon of phagocytosis, in which the body defends itself against a foreign body.

Prior to the designation of immunity, from the etymological root *immunis*, which is Latin for “exempt”, early physicians characterized organs that would later be proven as essential components of the immune system. The important lymphoid organs of the immune system are the thymus, bone marrow, and chief lymphatic tissues such as spleen, tonsils, lymph vessels, lymph nodes, adenoids, and liver. When health conditions worsen to emergency status, portions of immune system organs, including the thymus, spleen, bone marrow, lymph nodes, and other lymphatic tissues, can be surgically excised for examination while patients are still alive.

Many components of the immune system are typically cellular in nature and not associated with any specific organ, but rather are embedded or circulating in various tissues located throughout the body.

Classical immunology ties in with the fields of epidemiology and medicine. It studies the relationship between the body systems, pathogens, and immunity. The earliest written mention of immunity can be traced back to the plague of Athens in 430 BCE. Thucydides noted that people who had recovered from a previous bout of the disease could nurse the sick without contracting the illness a second time. Many other ancient societies have references to this phenomenon, but it was not until the 19th and 20th centuries before the concept developed into scientific theory.

The study of the molecular and cellular components that comprise the immune system, including their function and interaction, is the central science of immunology. The immune system has been divided into a more primitive innate immune system and, in vertebrates, an acquired or adaptive immune system. The latter is further divided into humoral (or antibody) and cell-mediated components.

The immune system has the capability of self and non-self-recognition. An antigen is a substance that ignites the immune response. The cells involved in recognizing the antigen are lymphocytes. Once they recognize, they secrete antibodies. Antibodies are proteins that neutralize the disease-causing microorganisms. Antibodies do not directly kill pathogens, but instead, identify antigens as targets for destruction by other immune cells such as phagocytes or NK cells.

*Corresponding author. Tatian Betakova, E-mail: Tatianbetakov1@yahoo.com.