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Editorial note on Macrophages

Bruno Leite*

Department of Anesthesia and Intensive Care, Salmaniya Medical Complex, Manama, Kingdom of Bahrain

***Corresponding author:** Bruno Leite, Department of Anesthesia and Intensive Care, Salmaniya Medical Complex, Manama, Kingdom of Bahrain, E-mail: brunol@hotmail.com

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Editorial

Macrophages are immune system cells that play a critical part in the host's defence. Death processes include infection-related killing processes and the accumulation of weakened or dead cells. Macrophages are specialised big cells that recognise, engulf, and kill target cells. The word macrophage comes from the Greek words "makro" and "phagein," which both indicate "to feed." Macrophages have an antiinflammatory role and may suppress immunological reactivity through cytokine release, in addition to promoting inflammation and boosting the immune system [1]. M1 macrophages are pro-inflammatory, whereas M2 macrophages are anti-inflammatory and pro-tissue healing. Monocytes, one of the primary types of white blood cells in the immune system, divide to create macrophages. When tissue is damaged or infected, monocytes leave the bloodstream and travel to the affected tissue or organ, where they undergo a series of alterations before transforming into macrophages. To resist diverse germs and intruders, macrophages can change their architecture. In this approach, macrophages serve as the host's initial line of defence against infection. Macrophages have been found to populate organs by replicating in specific locations, such as the testis. On the cell surface, each macrophage carries its unique protein identifiers [2]. The most significant feature of macrophages is their ability to phagocytose bacteria, viruses, and other foreign particles. Fc receptors on macrophage cell surfaces interact with the Fc component of IgG, making it easier for opsonized species to be absorbed. Fixed macrophages that stay in critical sites like the lungs, liver, brain tissue, bone, spleen, and connective tissue, absorbing external elements like bacteria and, if possible, recruiting other macrophages, remove dying cells more effectively. Antigen on the surface of infected macrophages in the lymph node increases TH1 proliferation mostly through macrophage IL-12 production [3]. The antigen is endocytised and processed if a B- cell in the lymph node recognises the same unprocessed surface antigen on the bacteria with its surface attached antibody. Antigen-Presenting Cells (APCs) are macrophages that activate T cells. In the effector phase of T cell-mediated immunological responses, this role is crucial. Antigen fragments are produced on the macrophage cell surface in conjunction with class II MHC proteins after ingestion and breakdown of foreign materials for interaction with the TCR of CD4+ helper T cells. By promoting the development of new blood vessels and the manufacture of collagen-rich extracellular matrix, macrophages help tissue healing. Macrophage-secreted cytokines work on a variety of tissue cells to regulate these processes. Fixed macrophages eat foreign materials such as pathogens and attract new macrophages in strategic sites such as the lungs, liver, brain tissue, bone, spleen, and connective tissue. If necessary, macrophages handle the elimination of dying cells to a higher extent. Macrophages are another line of defence against cancer cells and somatic cells infected with infection or parasites [4]. When a T cell recognises its antigen on the surface of an aberrant cell, it becomes an activated effector cell, producing chemical mediators known as lymphokines, which cause macrophages to become more aggressive. Macrophages are innate immune effector cells that phagocytoze bacteria and release pro-inflammatory and antibacterial mediators. Furthermore, macrophages play a critical function in the elimination of sick and damaged cells via programmed cell death [5].

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