Front Mol Immunol, 2018, 1(1), 1−2
DOI: 10.25082/FMI.2018.01.001

EDITORIAL

Frontiers in Molecular Immunology

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Immunology is a discipline to investigate the structure and function of the immune molecules or immune pathway and the causes of immunity to disease, which cover the study of all aspects of the immune system. The earliest concept of acquired immunology was originated from the inoculation of smallpox occurs in Wan Quan's (1499-1582) Douzhenxinfa,[1] and was further developed by Edward Jenner with the discovery of smallpox vaccine in 1796.[2] Immunology made a great advance towards the end of the 19th century, with the isolation of infectious bacteria by Robert Koch[3] and the demonstration of antibody activity against diphtheria and tetanus toxins by Emil von Behring and Kitasato Shibasaburo.[4] Following the work of Jules Bordet,[5] Karl Landsteiner,[6] Leon Calmette and Camile Guerin,[7] Niels Jerne[8,9] and others, the clonal selection theory was proposed by Frank MacFarlane Burnett in 1957.[10,11] This theory is an explanation of the mechanism for the generation of diversity of antibody specificity, and was confirmed by Joshua Lederberg and Gustav Nossal who showed that each B cell always produces only one type of antibody.[12,13] By the 1970s, work on cellular immunity and innate immunity recognized the role of various types of T-cells, dendritic cells and cytokines in the immune response.[14] Meanwhile, four new experimental methods (the flow cytometer, genetic engineering, isolate and clone antibody-forming cells and monoclonal cytolytic T-cells) were introduced, which enabled a further reduction from cells to molecules, and led to the discipline that now can be recognized as molecular immunology.[15]

Molecular immunology is a new subfield of immunology that aims to examine immune responses at a cellular and molecular level by modern biochemistry techniques.[16] The goals of molecular immunology are varied, and various techniques in the field are used in both laboratory and clinical settings. The high degree of specificity of antibodies is particularly important, as antibodies can be produced to target almost any biological component of interest.[17] The interactions between antigens and antibodies are central to molecular immunology and to immunology as a whole. Various immune system cells have receptors that bind to antigens in the body and trigger the immune response. Components of the immune system are also able to identify and attack cells that have been compromised, as in the case of viruses.[18] Greater understanding of the molecular basis of immune function has allowed for more targeted and effective diagnostic and treatment methods for some illnesses.

Journal of Frontiers in Molecular Immunology focuses on the areas such as immunological disorders, humoral responses, in vitro and in vivo immunological host responses, treatment of autoimmune diseases, immunotherapies for treatment of cancer, immune deficiencies, etc. Researchers working in molecular immunology hope that deeper understanding of the molecular basis of immunology will help them to better fight the diseases and disorders. Frontiers in Molecular Immunology is a peer reviewed open access scholarly journal dedicated towards the distribution of valuable information for societal benefit.

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Received: November 5, 2018 **Accepted:** November 6, 2018 **Published:** November 8, 2018

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Citation: Li CH and Guo M. Frontiers in molecular immunology. *Front Mol Immunol*, 2018, **1**(1): 1−2

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