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Journal of Vaccines & Vaccination

Editorial

# Immunomodulation and its Therapeutic Applications

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## INTRODUCTION

Immunomodulation encompasses all therapeutic interventions aimed toward modifying the immune reaction. Augmentation of the immune reaction is desirable to stop infection in states of immunodeficiency, to fight established infections and to fight cancer. In immunodeficiencies, treatment of the cause is most vital (e.g., malnutrition, HIV).

## THERAPEUTIC APPLICATIONS

Specific immune defects can seldom be corrected, and therefore the establishment of a replacement system by allogeneic somatic cell transplantation should be considered. To stop infection, vaccination, is that the best immunomodulatory technique [1]. New tools to control the response to vaccines involve the utilization of cytokines, viral vectors and even "naked DNA."

For the treatment of established infections, attempts to shift the immune reaction toward a Th1-type phenotype are desirable. For the treatment of cancer, efforts have focused mainly in making the cancer the well-liked target of the system of the patient. To the present effect, a spread of approaches are used, including cytokines, anti-CTL-4, tumor-specific antibodies and cellular therapies using tumor infiltrating lymphocytes and even somatic cell transplantation.

In allergy, autoimmunity and organ transplantation the goal is to weaken the immune reaction. Selected allergies could also be treated by specific desensitization. In autoimmunity and transplantation, drugs that blunt all immune responses are often used. The spread of medicine with different targets are used alone and together to induce immunosuppression [2]. These agents interfere with antigen presentation (anti-CD 154, CTLA4-Ig), T-cell activation (calcineurin inhibitors, including cyclosporine A and tacrolimus), or T-cell proliferation (sirolimus, mycophenolate mofetil, leflunomide).

Immunosuppressive drugs are wont to modify the auto-immune processes in certain situations of immune stimulation. Variety of medicine are extensively used and have stood the test of your time . These include corticosteroids, cytotoxic drugs like cyclophosphamide, chlorambucil and methotrexate, cyclosporin A, intravenous immunoglobulins, and anti-lymphocyte globulins.

These have proved to be beneficial during a number of hematological, renal, neurological and animal tissue disorders. Physical methods tried are plasmapheresis for Gullian-Barre' syndrome, myasthenia, M, and lupus nephritis. Thymectomy has been shown to be beneficial in myasthenia. Severe toxicity limits the utilization of radiation. Today it's used only as a pre-transplantation procedure.

With the event of hybridoma technology a spread of monoclonal antibodies are developed and tried against the mediators of inflammation including tumor necrosis factor α [1], interleukin 6 [2], and therefore the adhesion molecule CD 11b/18. Usefulness of those, however, is restricted by the event of autoimmune antibodies [3]. Efforts are on to supply less immunogenic hybrid monoclonal antibodies by splicing the murine variable region of immunoglobulin gene with the human constant region gene.

Interleukin-1 receptor antagonist is undergoing clinical trials within the treatment of atrophic arthritis, septic shock [3] and inflammatory bowel disease. T-cell vaccination by injecting low doses of cross linked autoreactive T-cells and inhibition of sophistication II HLA antigen presentation using peptides and antibodies have proved promising in animal trials. FK-506 and rapamycin are available and have the promise to exchange cyclosporin A. Immune tolerance also can be induced by the administration of oral antigens.

Immunomodulators are those extrinsic or intrinsic substances which regulate or alter the scope, type, duration or competency of the immune reaction. This paper presents an summary of the mechanisms of immunomodulation, and discusses selected chemical and biologic substances which are capable of modifying the immune or biologic response of the organism. The immunopharmacology, including in vivo and in vitro assays, of a completely unique acridine immunomodulator is discussed.

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**Received date:** December 2, 2020; **Accepted date:** December 16, 2020; **Published date:** December 23, 2020

**Citation:** Ferner R (2020) Immunomodulation and its Therapeutic Applications. J Vaccines Vaccin. S8: e003.

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