

THE APAC TIMES

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Completing a decade is a milestone in life. Same stands true for APAC Biotech. We have undoubtedly come a long way since 2009. APAC would like to thank all its members, fellow doctors & patients for a decade long trust in our expertise. Over the last decade, cancer awareness has gathered pace and personalized therapies are now widely recognized as an effective

extensive networks across the globe and have hosted high-level delegations of academics and decision-makers from regions as widespread as United States, Europe, the Indian sub-continent, Central Asia and South East Asia. Being the first company in India to receive the Indian FDA approval for manufacturing Dendritic cell therapy (**APCEDEN[®]**) for patients with



Dendritic Cell Under 40X Objective

A DECADE OF EXPERIENCE IN FIGHTING CANCER

treatment across the globe. The approach of developing nations has changed remarkably in 10 years. With new awareness based on education and training, many governments are gearing up efforts to improve healthcare standards. APAC has made a significant contribution to this by devising an efficient therapy for cancer patients. We have also established

Prostate, Ovarian, Colo-rectal and Non-small cell Lung Carcinoma (NSCLC), we continue our promise to benefit millions of cancer affected people by constantly integrating novel strategies in cellular therapeutics.

We look forward to another exciting decade of medical innovation and success against our common enemy –the **Big C!**



DENDRITIC CELL IMMUNOTHERAPY

Our Immune System

The human adaptive immune system is highly evolved & antigen specific where each pathogen is identified by its epitopes. The system comprises of several cells that work together in a synchrony to mount a strong immune response as well as generate immunological memory against non-self antigens. The uptake of antigen by Antigen Presenting Cells (APCs) from pathogen infected cells allows generation of tailored immune response which is further maintained in the body by memory cells.

Dendritic Cells – The Watchdog Of Immune System

Dendritic cells are the most potent type of antigen presenting cells that are branded for their probing, ‘tree-like’ or dendritic shapes. They are capable of initiating T cell primed adaptive immune responses and hence function as the ‘sentinels’ of the immune system. They are mainly present at body surfaces and within tissue lining of skin, lungs, nose, stomach and small intestine where they sense and sample the environment for self- and non-self-antigens. Although less abundant, these elite forces have numerous cytoplasmic processes & high surface area which permits them to establish an intimate contact with a large number of surrounding cells.

During their immature state, they migrate through bloodstream to non-lymphoid tissues where they continuously sample the environment by extending their processes through the tight junctions of epithelia to increase capture of antigens by endocytosis, phagocytosis & pinocytosis. Upon antigen capture, these cells undergo maturation exemplified by enhanced antigen processing, induction of Major Histocompatibility Complex (MHC) molecules, co-stimulatory molecules (CD80/86) coupled with a cocktail of cytokines. Once matured, these cells crawl their way to lymph nodes where they interact with naïve Helper and Cytotoxic T cells via cross presentation and B cells

to shape the adaptive immune response. Besides shorter life span, exploiting the immune-regulatory capacities of dendritic cells could turn them into the most effective adjuvant to enhance the host’s immune defenses.

Cancer – The Master Of Disguise & Misdirection

In an event of cancer, the immune system is well equipped to differentiate between healthy and infected cells based on their cell surface markers expression. In most cases, cancer cells acquire uncanny genetic changes that allow them to escape the surveillance by the normal immune cells. They continue to thrive and survive in the patient system where their progenitor cells tend to inherit those mutated DNA. Besides immune escape, tumor cells mediate production of IL-10 that has shown to suppress dendritic cell activity. This ability of conning or stopping immune cell responses results in allowing the cancer cells to develop, grow, metastasize, and eventually kill patients. Unlocking these mechanisms of immune inhibition is crucial to understanding how cancers escape the normal immune system. It will be promising to boost natural cancer-killing capabilities and degrade immune inhibitory processes in cancer patients to unleash the dormant power of the immune system.



Immunotherapy – Biomedical Way To Fight Cancer

In the last two decades, Immunotherapy has emerged as a novel therapeutic intervention to fight cancer cells. This form of biotherapy is specifically designed and engineered in a way that it stimulates patient's immune system to efficiently recognize and target key epitopes that are expressed only on cancer cells. Being autologous (self-derived from the patient), it has nearly zero side effects. Moreover, clinical data suggests that combining immunotherapy with conventional therapy (chemotherapy or radiation) can significantly improve the quality of life and overall survival rate among cancer patients.

The Evolving Role Of Dendritic Cell Therapy For The Treatment Of Cancer

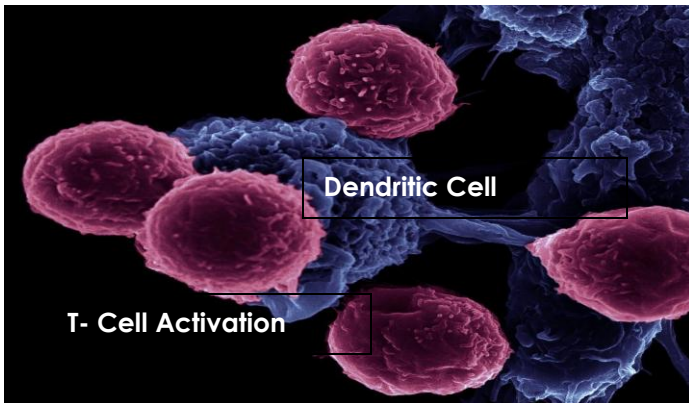
Despite the availability of multiple modalities of cancer treatment, the lack of therapeutic benefit against several evolving & inoperable solid malignancies has led to search for new therapeutic options such as adaptive immunotherapy. Clinical studies have demonstrated that increased densities of dendritic cells have been associated with better clinical outcome, suggesting that these cells can contribute in governing cancer progression. Dendritic cell-based therapy can subvert these mechanisms since they represent a new and promising immunotherapeutic approach for the treatment of advanced cancers and prevention of cancer with little or no evidence of treatment-limiting toxicity. The ability to initiate innate and adaptive immune response is exploited in dendritic cell therapy where they are generated and matured ex-vivo to present patient derived tumor specific antigens. Once matured, they are administered back into the patient system with an aim to trigger tumor specific immune response.

APCEDEN®- First and Only Indian FDA approved Dendritic cell therapy

Dendritic cell therapy is an autologous approach involving the use of patients own blood and tumor tissue. APCEDEN® is the first Indian FDA approved dendritic cell-based therapy developed by APAC Biotech that is currently used for the treatment of 4 types cancer (**Ovarian, Prostate, Colorectal and Lung**). The 8 days production process comprises of isolation and separation of monocytes from patient's blood by Apheresis. The monocytes are then cultured in a specialized and sophisticated laboratory in the presence of immune stimulatory agents (cytokines) to induce monocyte differentiation to immature dendritic cells. Post differentiation, the cells are now exposed to patients own inactivated whole cell tumor tissue lysate to facilitate antigen uptake and induce maturation. Following maturation, the doses are quality checked and administered intravenously biweekly to boost and fortify the immune system of the patient and provide the necessary impetus the body requires to fight back the cancer. The therapy comprises of 6 doses each containing 3-5 million mature dendritic cells expressing epitopes specific to patient's cancer. APCEDEN® is completely autologous, it is safe and does not produce any toxicity which is generally observed with other therapies.



Moreover, clinical studies do confirm the safety and efficacy of APCEDEN[®] thus improving quality of life and overall survival rate among recurrent cancer patients.



APCEDEN[®] therapy approved by Government of India and is now available at leading hospitals across India.



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