

## The MDCTL Facilities



Autologous Stem Cell Therapy offers a promising area of hope for the amelioration of many diseases for which there has previously been no cure and minimal hope of prevention. The research and advances in its potential and practical applications as a rapidly important developing field is now available at the Lung Center of the Philippines, Department of Pathology, Molecular and Cellular Diagnostics and Therapeutics Laboratory.



## Design Timeline

*Consultation*  
*Signing of Informed Consent*  
*Blood Extraction for Circulating Tumor Cells and Blood Tests*  
*Hematology Clearance*  
*Growth Factor Administration*  
*Admission and Central Line Insertion*  
*Leukapheresis (Stem Cell Collection)*  
*Dendritic Cell Growth and Maturation*  
*Vaccination and IFN-gamma Analysis*



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## Lung Center of the Philippines

### Autologous Dendritic Cell Vaccine Therapy



### Molecular Diagnostics and Cellular Therapeutics Laboratory

# Autologous Dendritic Cell Vaccination



## What are Stem Cells?

Stem cells are special type of cells in the body that have the ability to differentiate into other cell/tissue types. This ability allows them to replace cells that have died. Because of this ability, they have been tapped to replace or control defective cells/tissues in patients who have certain diseases or defects.

There are three sources of autologous adult stem cells: 1) Bone marrow, harvested by aspiration 2) Adipose tissue (lipid cells), harvested by liposuction, and 3) Blood, collected through leukapheresis - a process where blood is drawn from the patient, passed through a machine that selects only the stem cells and returns all other components of the blood back to the patient.

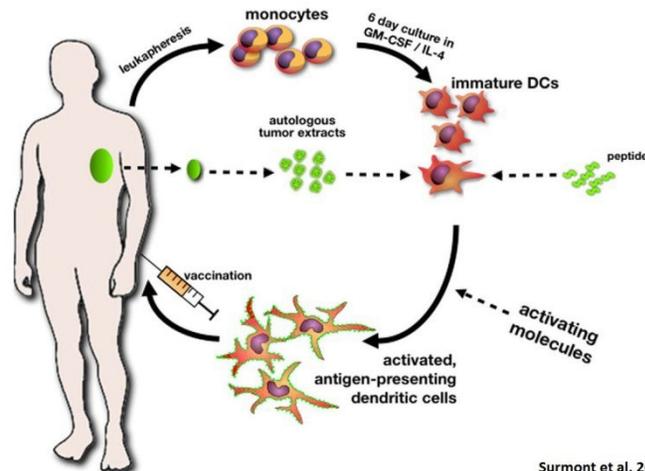
## What are Dendritic Cells?

Dendritic cells or DCs are special type of cells that are key regulators of the immune system, acting as professional antigen-presenting cells (APC) capable of activating naive T cells and stimulating the growth and differentiation of B cells.

Dendritic cells can be produced from adult stem cells by stimulating them with growth factors. At certain development stages, they grow branch-like projections, the "dendrites", that give the cell its name. These cells do not have any special relation with the neurons which also possess similar appendages.

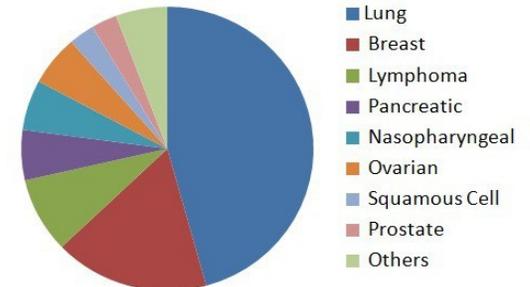
## What is a Dendritic Cell Vaccine?

It is a form of active immunotherapy using dendritic cells to trigger the immune response against diseases including cancer. Antigens derived from irradiated tumor cells are introduced to mature dendritic cells to teach them to recognize the tumor and once ready are injected to the patients'



Surmont et al. 2011

Cancer types targeted with DC vaccination at MDCTL-LCP



skin like an ordinary vaccine. Once in the body they migrate to the lymphoid tissues where they activate other white blood cells to go out and attack the cancer cells resulting in eradication of the tumor cells or stabilization in the disease process.

Autologous Dendritic Cell Vaccination is safe because all the components of the vaccine come from the patient. In fact, different types of cancer have been targeted for autologous dendritic cell vaccination at the Molecular Diagnostics and Cellular Therapeutics Laboratory of the Lung Center of the Philippines.

## When can it be done?

Anytime, preferably before any other form of treatment is given because the stem cells have to be harvested. It can sometimes be used by itself to treat different types of cancer which are non-responsive to the usual treatment or it can be used as an adjunct to other standard therapies (e.g., chemotherapy or radiotherapy) to boost their effects. Side-effects arising from other cancer treatments can also be minimized with this form of therapy.