



### Latest Advances in Ovarian Cancer Treatment

A new study conducted by researchers in UCL have shown that women who are diagnosed with ovarian cancer due to mutation in the BRCA1 gene have shown to have lower populations of one type of protective bacteria called *Lactobacillus* in the birth canal. *Lactobacilli* are important because they produce lactic acid which reduces the pH of the vagina, preventing hostile bacteria from overgrowing and dominating the vaginal microbiome. The study group comprised of 580 women all across Europe aged between 18 to 87 years. The examination of cervical smear samples confirmed that **BRCA1**

## Unlocking The Promise Of Dendritic Cells for Ovarian Cancer patients



Ovarian cancer, like most solid tumors, is the deadliest gynecological malignancy that exhibits 5-year survival rate among 47% of cases. Lack of early detection causes 75% of patients to seek medical attention at either stage III or IV. General management of the disease prioritizes surgery and tumor reduction by cytotoxic Platinum and Taxane chemotherapy. While clinical remissions are obtainable, majority of patients will succumb to their disease with a median survival of ~16 months. Resistance to standard treatment along with high degree of epigenetic mutation among tumor cells manifests a need for novel strategies to achieve a durable clinical outcome.

The complexity and immunogenicity of cancer cells can be effectively revoked with advent of combined Immunotherapies. Cancer immunotherapy is categorized as active or passive immunotherapy employed for inducing, enhancing or suppressing the immune response. Passive immunotherapy involves the use of antibody targeting specific epitopes whereas active immunotherapy refers to enhancement of patient's immune response after administration of specialized immune cells.

Dendritic cell (DC) therapy is one of these immunotherapeutic strategies classified in the active group that attempts to increase the number of efficient DC (and consequently tumor-specific T cells) in order to shift the balance from immune-suppression to immune surveillance or to reprogram the immune system away from the '*escape*' phase towards the equilibrium or elimination phase. Until now, **37 clinical trials** have been globally performed on ovarian cancer patients to investigate the safety and efficiency of DC therapy on recurrent cancer patients. These trials involve DC maturation and activation isolated from the patient's own white blood cells. Personalized Dendritic cell based therapy has emerged as a new and promising approach that could integrate the current standard of care for the treatment of a large variety of tumors.

carriers with no ovarian cancer showed a 3-fold decline in *Lactobacilli* population.

The study is acknowledged by Lancet Oncology.

<https://www.ucl.ac.uk/news/2019/jul/vaginal-bacteria-linked-ovarian-cancer>

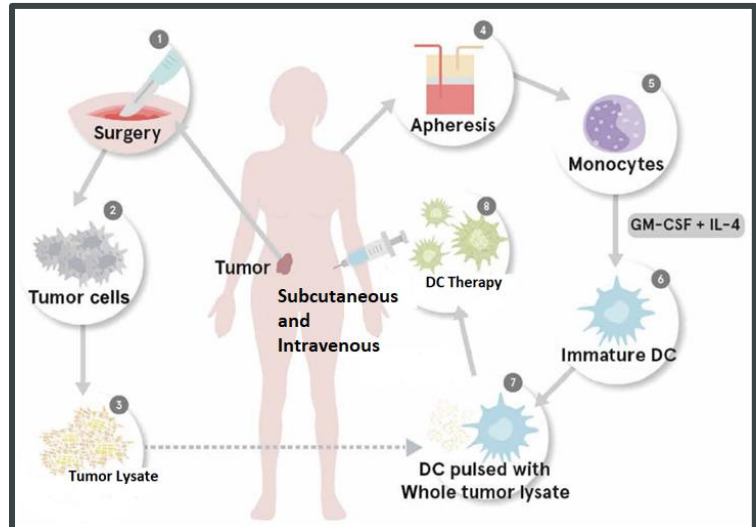
UPCOMING CONFERENCES ON OVARIAN CANCER

<https://womenoncology.conferenceseries.com/>

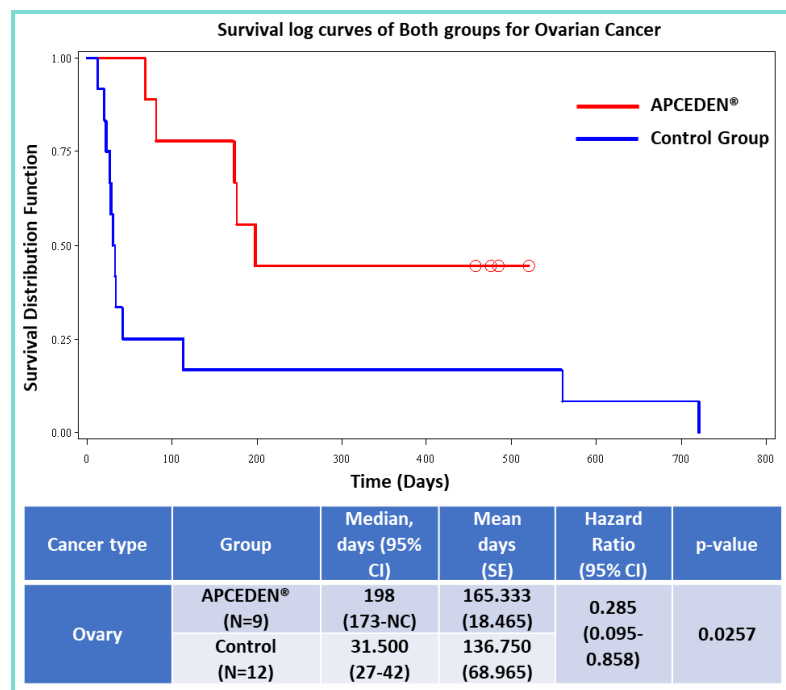
<https://womenshealth.cancersummit.org/>

Personalized DC therapy manufacturing requires patient's PBMCs (Peripheral Blood Mononuclear cells) harvested from Apheresis procedure. In addition it also requires patient's specific tumor tissue/cells obtained after surgery or biopsy (*Figure 1*).

**Figure 1: Scheme of DC Therapy (APCEDEN®) production and administration.**



In India, Phase II clinical trials were conducted by **APAC Biotech** in 2011 that demonstrated the safety, efficacy and tolerance among patients with refractory solid tumors along with a prolonged survival benefit of around ~200 days. For refractory ovarian cancer (n=9), patients reported a survival benefit of 198 days compared to the control group (n=12) (*Figure 2*).



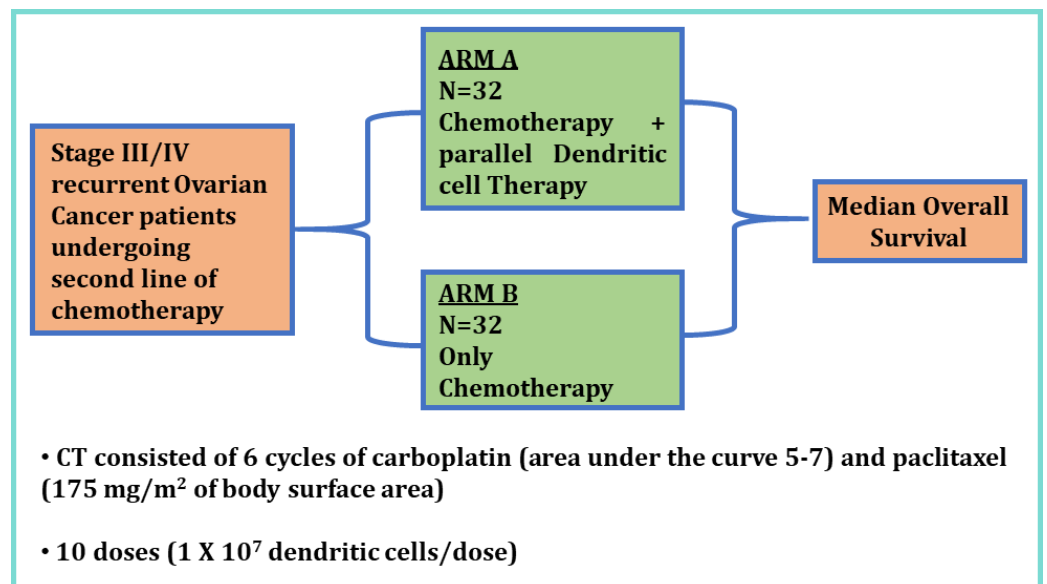
**Figure 2:** Kaplan Meier plot depicts an increased survival distribution (p=0.0257) among treated group. Among 9 patients enrolled for Ovarian cancer, 7 patients were able to demonstrate an increased overall survival of 198 days compared to their control arm of 12 patients devoid of DC therapy.

Based on the clinical outcome of the trial, APAC Biotech became the first Indian

company to receive approval from the Government of India for the use of autologous monocyte-derived and tumor lysate-pulsed mature DC-based immunotherapeutic product (**APCEDEN®**) approved for treatment of four cancer indications (**Prostate, Ovarian, Colorectal and Non-Small Cell Lung Carcinoma**).

Several studies have been underway since then in which scientists have used a comparable strategy for the production of personalized DC therapy. The use of whole tumor tissue lysate for stimulation and preparation of DC therapy allows these engineered cells to mount an immune response against thousands of epitopes expressed over tumor cells while sparing the healthy cells. In these trials, the vaccines were either administered concurrently as a chemotherapeutic adjuvant or sequentially after chemotherapy in newly diagnosed cancer patients to unveil the potential of DCs in increasing median overall survival post treatment.

Recently, Czech Republic based biotechnology company conducted a randomized Phase II trial among patients with recurrent ovarian cancer. Clinical findings reported that patients administered DC vaccine sequentially after chemotherapy showed an improved progression free survival of 13.4 months compared to the control group. The data was extremely acknowledged by **American Society of Clinical Oncology (ASCO, 2018)** and **Society of Genecology Oncology (2019)** (*Figure 3*). DC based product provided a promising maintenance treatment option to delay progression of epithelial ovarian carcinoma (*Figure 4*).



*Figure 3:* Schematic representation of study plan employed in Phase II clinical trial.

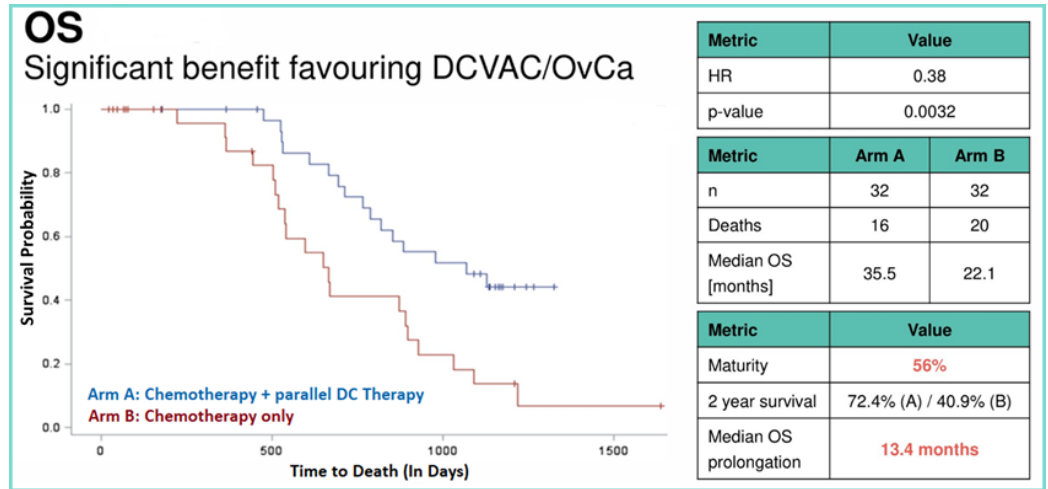
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*Figure 4: Kaplan Meier plot depicts that concomitant DC Therapy in second line treatment significantly increased Overall Survival (OS) by 13.4 months. Data adapted from- Dendritic Cell Vaccine Combined with Second Line of Chemotherapy in Patients with Epithelial Ovarian Carcinoma, Final Analysis of a Phase II, Open Label, Randomized, Multicentre Trial.*

With changing times and evolving lifestyle, conventional therapies are failing to elevate our immune senses to fight serious ailments like cancer. Autologous DC therapy is the holy grail of future medicine. They are safe and hold no side effects as they employ the use of self-monocytes and tumor antigen. Also, the flexibility of administration and combination with other treatments ensures quick and efficient recovery with minimal chance of progression.

In this battle with cancer, patient can always be one step ahead by storing their tumor with **APAC Tumor Bank**. Since tumor holds the key information, lifetime storage of tumor at nominal charges with APAC Tumor Bank allows the patient to explore their therapeutic options that comprise of personalized therapy to improve quality of life and survival rate.



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