

## Cytotron, an innovative therapy for cancer

10 September 2009 | News

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*After many years of research, development and speculation, Scalene Cybernetics has indigenously developed cutting-edge non-invasive cancer treatment device, Cytotron.*

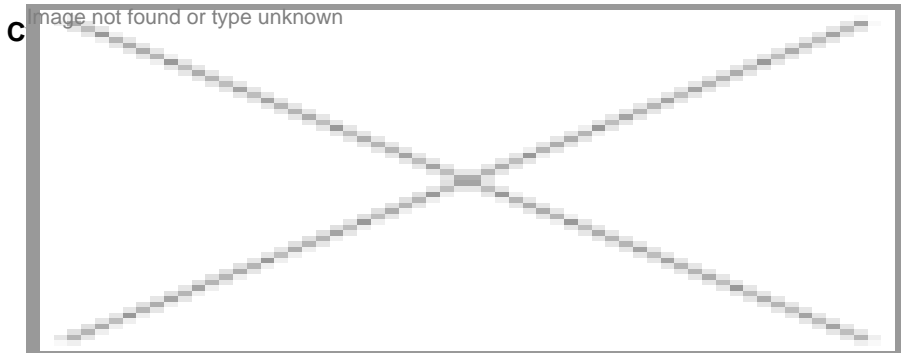
*Thus paving the way for an innovative application process for tissue regeneration and degeneration.*

Non-invasive cancer treatment devices are increasingly available and are being accepted by a broad range of patients world over for their unique attributes. Most of the leading Indian medical institutions too have installed non-invasive therapy options, however, they are all developed and manufactured by bigger foreign medical devices companies. Till recently, India could hardly boast of any such biomedical breakthrough technology. But, after several years of research, development and speculation, the indigenously developed cutting-edge non-invasive cancer treatment device, Cytotron, has finally arrived. Center for Advanced Research and Development (CARD), the research wing of Scalene Cybernetics, the Bangalore-based organization engaged in research on cutting-edge medical electronic technologies, has made a noble invention for non-invasive treatment of cancer and osteoarthritis.

With over two decades of research on rotational field quantum nuclear magnetic resonance (RFQMR) technology, Dr Rajah Vijay Kumar, a pioneering researcher and an opinion leader in the field of biophysics and radiobiology along with his team at Scalene Cybernetics has invented the new non-invasive treatment for cancer and osteoarthritis. He holds the worldwide patent for his amazing invention, and has licensed the technology to Scalene to manufacture and market it internationally.

According to Dr Kumar, director and chief scientific officer, CARD and board chairman of Scalene Cybernetics, "The development of this technology started way back in 1987. The basic idea behind this technology is to alter the

transmembrane potential (TMP), the potential or voltage difference between the cell membrane in human tissue to stimulate specific protein using TMP pathways, resulting in tissue regeneration or degeneration as required."



The Cytotron, a breakthrough innovation, is different from other cancer treatments such as surgery, radiotherapy and chemotherapy. Based on RFQMR technology, the treatment modality through Cytotron is highly advanced and shows phenomenal improvement in patient's quality of life without leaving any major side-effects. In fact, combining Cytotron with chemotherapy, substantially reduces the side-effects of even powerful chemotherapeutic molecules. On the other

hand, Cytotron radiosensitize the tumor for traditional radiotherapy to work better on the tumor and reduce collateral damages as the surrounding tissue will have lower radiosensitivity.

"Conventional radiotherapy uses ionizing radiation at the end of high frequency spectrum and can cause collateral damage," says Dr Kumar. However, he maintains that Cytotron uses a more benign, non-ionizing variable proton density guided resonance approach. "The cancer stem cells that sing the loudest will be attacked first, poorly differentiated cells next and finally well-differentiated ones. Normal cells don't sing at all so they are never attacked. This approach is said to have no side-effects," Dr Kumar explains.

### It's all about results

The clinical trials for Cytotron were conducted at CARD center, so far over 140 terminal cancer patients have undergone treatment through the product during clinical trials. Of these, the one-year survival rate was 52 percent while 92 percent of the patients had improved quality of life, for whatever period they lived, as assessed by accepted quality of life protocols. "The technology has a proven track record, and 52 percent of the end-stage cancer patients, who were expected to live for a month or two have survived for more than a year. The three primary aims we are looking at with this technology are to arrest cancer growth, stop its spread from organ to organ and provide better quality of life," informs Dr Kumar.

Cytotron has recently obtained the European Union (EU) certification by Underwriters Laboratories (UL) as Class IIa medical device. With the Cytotron now being recognized and accepted as one of the therapeutic modality with the grant of the EU certification, there has been a widespread interest in the technology for the treatment of cancer and osteoarthritis. While commenting on the importance of CE certification, Dr Kumar says, "The CE mark is the most mandatory requirement for placement in the European Economic Area (EEA). The CE certification, which is one of the most respected marks in the world, ensures adherence to the various consumer safety, health and environmental benchmarks of the EEA countries."

The company has received requisitions to install Cytotron from Europe, Middle East, Australia, Malaysia, Canada, New Zealand, South Africa and Mexico. Dr Kumar expects over 1,000 Cytotron machines to be installed around the globe by 2015, providing relief and better quality of life to patients. Scalene has so far sold 16 units of Cytotron in India and other markets.

Cytotron 864 can treat all types of solid tumors, including widely metastatic disease in terminal patients. Though terminal systemic malignant diseases can be treated, no trials have been conducted so far to prove its efficacy in patients.

There have been many claims made but it is certainly true to say that Cytotron will allow the next level of performance in cancer treatment. Cytotron was developed with the help of internal funding. Dr Kumar was unable to give us the exact figure of investments made towards developing this product. However, he shared that developing Cytotron required 100 man years of research.

Being a technology-oriented company, Scalene over the period has indigenously developed many technologies in the field of medical engineering, artificial intelligence, modeling and simulation. In the area of medical engineering, it has patented two important technologies – Cytotron and Haemoseis 256, which are advanced therapeutic and diagnostic devices. The company's current revenue is in the range of Rs 35-40 crore with Rs 6-8 crore from its diagnostic device business. The company is currently working on a new type of drug delivery product. It is also developing a device for treating hepatopancreatic dysfunctions.

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