

Advanced Therapies for Treating Prostate Cancer:

NanoKnife/Irreversible Electroporation (IRE) for low and intermediate risk PCa

IR-ECT (IRE and Electrochemotherapy) for high risk PCa

ECT as a problem solver for T4 cancers rectal/bladder/sphincter infiltration – with preservation of function

Systemic treatment and preservation of sexual function with immunotherapy, Lu177 and Cyberknife radio-surgery

Millions of men are affected by prostate cancer worldwide. Standard treatments, such as the surgical removal of the prostate or radiation therapy, are associated with significant side effects, such as impotence (70 – 80%) and incontinence (20 – 50%), which intolerably reduce the patient's quality of life, without providing a reliable cure (see Han Tables, Johns Hopkins University: recurrence rates after radical prostatectomy).

This has motivated us to develop a novel treatment for prostate cancer using the method of **Irreversible Electroporation – IRE**, and variations thereof. Us, that is an interdisciplinary team composed of medical doctors and scientists at VITUS Prostate Centre in Offenbach, Germany – and the patients who have entrusted us with their health and wellbeing. After more than 1000 successfully treated patients in 2019, we have become the leading institution for focal prostate cancer therapy worldwide.

IRE provides a much advanced treatment compared to the surgical removal or radiation therapy of the prostate in that it affords reliable local tumour control without the risk of incontinence (0%) and a very low rate of impotence (< 10%). It does this by destroying cells selectively whilst preserving nerves, blood vessels and other organ structures.

Whilst IRE kills cells immediately, **ECT – electro-chemotherapy** – employs “gentle” electrical pulses which induces pores in cell membranes without killing the cell. This so called “reversible electroporation” technique affords the transport of large molecules into and out of cells. By facilitating the entry of chemotherapeutics into the opened cells, focal ECT was developed, which can be used to treat cancer several hundred times more effectively than normal chemotherapy.

Electroporation treatments (ECT) of prostate cancer are a significant step forward in the quest for curing prostate cancer. They provide a gentler way to treat prostate cancer and provide therapeutic options for advanced prostate cancers and cancer recurrences which are not amenable to surgery and radiation therapy anymore.

But we have taken focal therapy with electroporation techniques even further: By combining IRE and ECT with dendritic cells and oncolytic viruses, **immuno-oncological treatments** can be employed which not only kill prostate cancer locally more effectively, but also address the systemic component of prostate cancer, i.e cancer cells and micro-metastases which have been spread throughout the body and for which there are currently no effective therapies. Electroporation and immunotherapy are natural partners, since IRE and ECT release tumour antigens which are then presented by dendritic cells to natural killer cells, the body's own weapon against cancer.

In collaboration with our partners, we also use Cyberknife radio-surgery for the non-invasive removal of lymph node metastases and Lu177 (Lutetium 177) radio-ligand therapy as an alternative to androgen deprivation therapy (ADT) in men with metastasised prostate cancer who want to preserve their sexual function.

Our most important recommendation to all men with prostate cancer is: Take your time to understand prostate cancer and the multitude of modern treatment options. You have plenty of time, because prostate cancer is a very slowly progressing disease. Don't let yourself be rushed into a treatment which you might later regret. At VITUS, we are prepared to help you make the right decision.

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