

Precision Medicine in Prostate Cancer

Targeted therapy and precision medicine are expected to be the future of treating advanced prostate cancer. Treating prostate cancer is not a one-size-fits-all approach, and this is especially true for advanced disease. New targeted treatments and advancements in precision medicine can provide patients with a personalized treatment plan based on their specific prostate cancer diagnosis with the hope of better outcomes and prolonged survival.

What is Targeted Therapy?

Targeted therapy uses drugs that are designed to find and attack cancer cells. They shut down specific proteins in cancer cells that help the cells divide, grow, and spread. Targeted therapies may lead to fewer side effects than other conventional prostate cancer treatments.



WHERE ARE WE NOW?

PARP Inhibitors

PARP inhibitors are a form of targeted prostate cancer treatment. PARP stands for poly-ADP ribose polymerase. It is a protein that helps damaged cells repair themselves. PARP inhibitors stop the PARP from repairing cancer cells.

A prostate cancer patient with a mutated BRCA1 or BRCA2 (short for BReast Cancer genes 1 and 2) should consider the use of PARP inhibitors. A mutation in the BRCA1/2 genes is discovered using genomic and genetic testing.

Food and Drug Administration (FDA)-approved PARP inhibitors include olaparib (LYNPARZA[®]) and rucaparib (RUBRACA[®]).

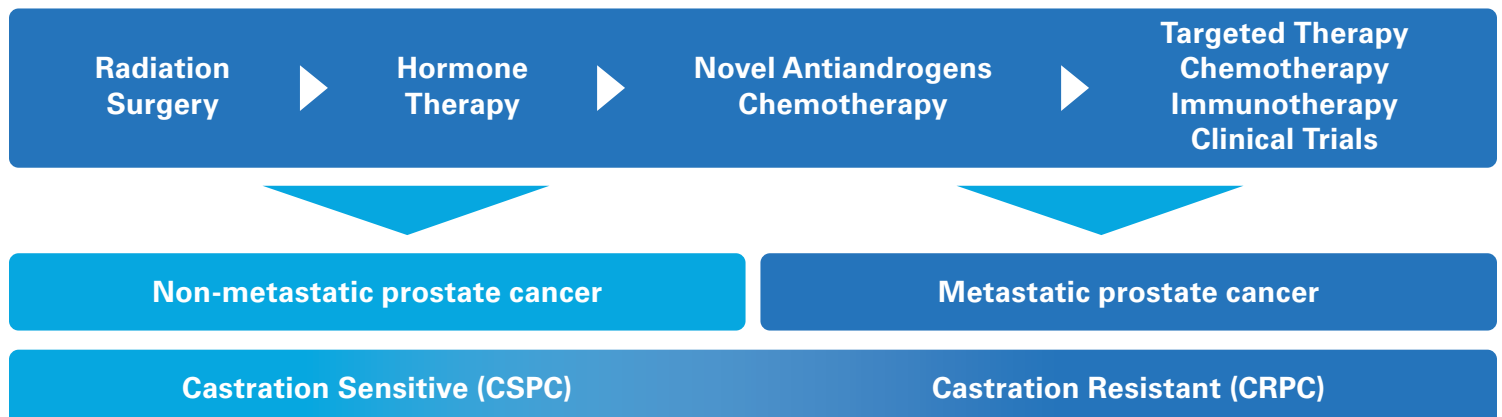
LOOKING AHEAD: The Future of Precision Medicine for Prostate Cancer

PSMA Targeted Therapies

PSMA, or prostate-specific membrane antigen, is a protein found in low levels on the surface of normal prostate cells and in much higher amounts on prostate cancer cells. Targeting PSMA enables treatment to focus on the prostate cancer cells rather than healthy cells in the body. Only patients with high levels of PSMA can benefit from PSMA therapies.

Lutetium-177 vipivotide tetraxetan (Pluvicto[®]) is a PSMA-targeted Radioligand Therapy (RLT) approved by the FDA for metastatic castrate-resistant prostate cancer (mCRPC). [There are other PSMA targeted therapies in late-stage clinical development, including additional RLTs.](#)

PROSTATE CANCER AND TREATMENT PROGRESSION



These treatment and diagnostic advancements aim to:

- Find prostate cancer earlier with advanced imaging
- Deliver radiation directly to cancer
- Reduce side effects



Radiopharmaceuticals

Radiopharmaceuticals have been used for decades to diagnose various diseases and treat certain cancers. Now, new radiopharmaceuticals are being used to deliver radiation therapy directly to cancer cells. Targeting the radiation directly to the cancer cells may reduce side effects. Researchers are also working to identify new agents that may help these therapies find – or target – even the smallest amount of cancer cells in the body.

Radioligand Therapy (RLT)

Radioligands precisely deliver radiation to tumors, aiming to damage the DNA of cells within the tumor while working to preserve healthy tissue in other organs to minimize off-target effects & toxicity.

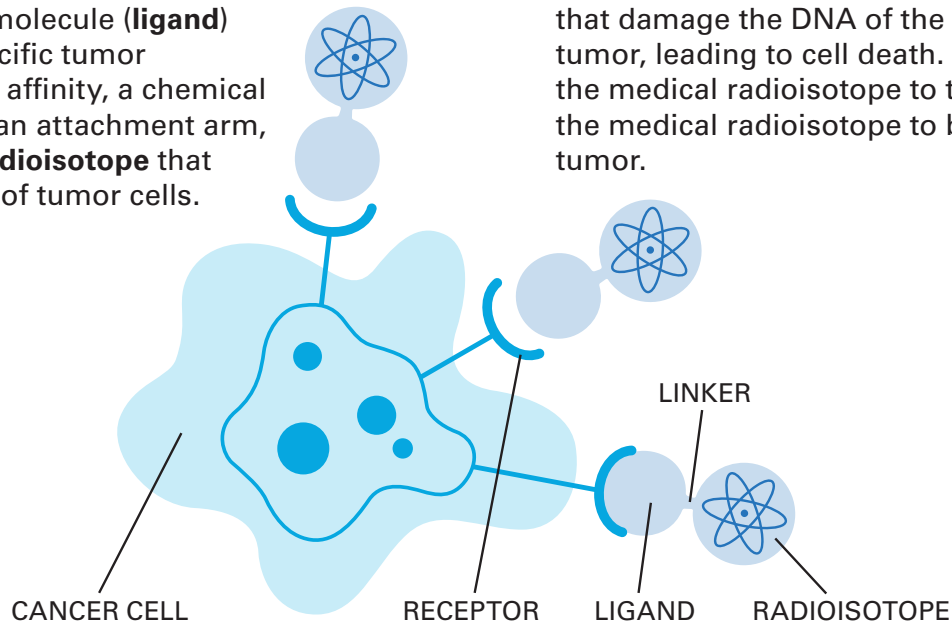
What are Theranostics?

Theranostics is a combination of the words *therapeutics* and *diagnostics*. The concept begins with diagnostic imaging of to identify where tumors are located in their body, and then, using a similar process, deliver a targeted therapy directly to the tumors.

Radioligand therapy is a type of theranostic therapy, and therefore the two terms are commonly used interchangeably.

WHAT IS A RADIOLIGAND?

A radioligand is composed of three parts: a targeting molecule (**ligand**) that binds to a specific tumor **receptor** with high affinity, a chemical **linker** that acts as an attachment arm, and the medical **radioisotope** that enables treatment of tumor cells.



HOW DO RADIOLIGANDS WORK?

The medical isotope emits high-energy particles that damage the DNA of the cells within the tumor, leading to cell death. The linker attaches the medical radioisotope to the ligand, enabling the medical radioisotope to be delivered to the tumor.



DID YOU KNOW?

When prostate cancer spreads, it most often spreads to the bones. Denosumab (XGEVA®) and radium Ra 223 dichloride (XOFIGO®) are approved by the FDA for prostate cancer that has spread to the bones.

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To learn more, visit www.zerocancer.org/targeted-therapy.