# A synergistic chemotherapy and radiotherapy drug delivery technology for treating prostate cancer tumors

## Unmet Need

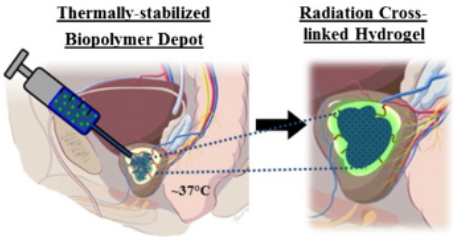
Pancreatic cancer is one of the deadliest manifestations of cancer in clinical oncology. Despite accounting for only 3.2% of all cancer cases, it is the third leading cause of cancer-related mortality. National Comprehensive Cancer Network guidelines recommend external beam radiotherapy (EBRT) combined with chemotherapy as the first-line treatment for locally advanced tumors. For all its clinical benefits, EBRT possesses significant limitations in the clinical management of pancreatic cancer which contribute to a 5 -year survival rate of less than 11.5% for patients with loco-regionalized pancreatic tumors. Therefore, there remains a need for new compositions and treatment methods that can overcome the disadvantages of convention solid tumor treatment for patients suffering from pancreatic cancer.

## Technology

Duke inventors have reported a radiotherapy drug delivery technology intended to improve the treatment of locally advanced pancreatic cancer. This is a synergistic treatment strategy that combines chemotherapeutics with a liquidly injectable biopolymer that delivers radiotherapies. The approach relies on the thermally responsive properties of an elastin-like polypeptide (ELP) to deliver continuous, β-emission therapy using radionuclides. ELPs are peptide polymers that exhibit lower critical solution temperature phase behavior, enabling them to form gel-like depots that increase the half-life of their cargo. This technology has been demonstrated in animal models.

## Other Applications

This technology is amenable to treating a wide range of




### Duke File (IDF) Number

IDF #:T-006448

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Biomedical Engineering (BME)

### Publication(s)

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### External Link(s)

• From the lab of Dr. Ashutosh Chilkoti

other cancers, including melanoma, prostate, breast, colorectal, cervical, and ovarian cancers.

## Advantages

- ELP can be conveniently synthesized in high yield as a monodisperse macromolecule by recombinant DNA synthesis methodologies
- Studies with 131-I-ELP and paclitaxel revealed higher accumulation in tumors
- Analysis showed no significant exposure or damage to healthy tissues