

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

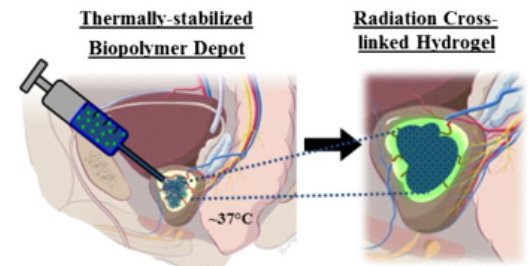
This technology is amenable to treating a wide range of other cancers, including melanoma, prostate, breast, colorectal, cervical, and ovarian cancers.

Advantages

- ELP can be conveniently synthesized in high yield as a monodisperse macromolecule by recombinant DNA

Duke

LICENSING & VENTURES



Duke File (IDF)

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Links

- [From the lab of Dr. Ashutosh Chilkoti](#)

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synthesis methodologies

- Studies with ¹³¹I-ELP and paclitaxel revealed higher accumulation in tumors
- Analysis showed no significant exposure or damage to healthy tissues

Publications

- [Injectable polypeptide micelles that form radiation crosslinked hydrogels in situ for intratumoral radiotherapy \(J of Controlled Release, 2016\)](#)
- [Development of an Injectable Brachytherapy Using Self-Assembly Polypeptides \(Brachytherapy, 2016\)](#)
- [PCT App US2019/061144](#)

Patents

Patent Number: 17/294,368

Title: LIQUIDLY INJECTABLE, SELF-STABILIZING BIOPOLYMERS FOR THE DELIVERY OF RADIONUCLIDE

Country: United States of America