

ChemoGel – A Drug Delivery Platform for Intratumoral Delivery of Chemotherapeutics in Pancreatic Cancer

ChemoGel is a unique, thermoresponsive, hydrogel drug delivery platform for the site-specific delivery and sustained release of chemotherapeutics at solid tumour sites. ChemoGel is a platform technology which enables the sustained local delivery of chemotherapeutics agents and is intended for use in the chemical ablation of solid tumours alone or in conjunction with other treatment approaches. The technology is now in pre-clinical development at RCSI for its first clinical indication in pancreatic cancer.

BACKGROUND

Locally Advanced Pancreatic Cancer (LAPC)

Pancreatic cancer has the highest rate of death per incidence of any cancer. The best chance of increased survival for these patients is surgical resection, however only a small % of patients are suitable for surgery. This is in part due to the dense, avascular nature of the tumour itself which is uniquely resistant to systemic chemotherapy. There is a clinical unmet need for an effective neoadjuvant therapy in pancreatic cancer to reduce overall tumour burden and size in certain patients making them eligible for surgical resection.

VALUE PROPOSITION

Pancreatic cancer is one of the most dangerous malignancies and is the fourth most common cause of cancer deaths in the U.S. The global pancreatic cancer treatment market is expected to reach USD 4.2 billion in 2025. Systemic chemotherapy, in conjunction with radiation and surgery is the most common approach to treatment, but is generally associated with a range of toxic, off-site side effects which in many cases can be dose limiting. ChemoGel enables the targeted delivery of chemotherapeutics, at adequate concentration, to the required site of action thereby achieving a high local concentration for prolonged periods and maximising efficacy while reducing systemic toxicity.

TECHNOLOGY

Thermoresponsive hydrogels have the ability to phase-transition from an injectable liquid at room temperatures to a solid gel at physiological temperatures. ChemoGel is based on a novel thermoresponsive hydrogel technology developed at RCSI which can be used to deliver multiple chemotherapeutics simultaneously.

ChemoGel is a liquid at room temperature, but upon reaching body temperature inside the tumour it quickly transitions to a solid gel providing a depot for sustained local drug release. ChemoGel aims to offer a new site-specific approach to cancer treatment by delivering drugs directly to the tumour using minimally-invasive, image guided techniques such as by endoscopic ultrasound fine needle injection (EUS-FNI).

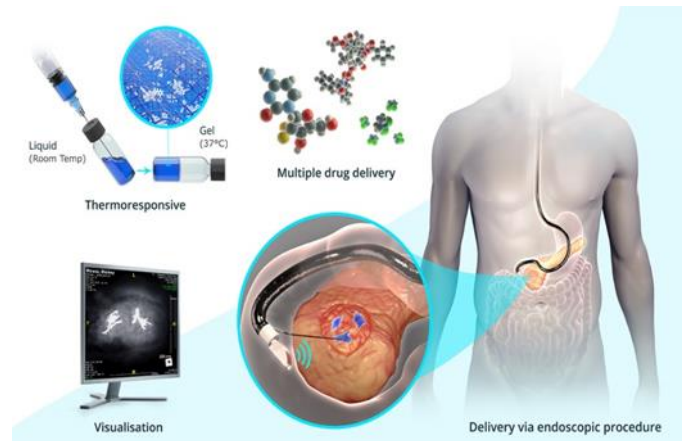


Fig 1. Proposed clinical administration of ChemoGel to pancreatic tumours via Endoscopic Ultrasound Fine-Needle Injection

FEATURES	BENEFITS
Thermoresponsive Hydrogel	Injectable via clinically relevant needles and catheters
Incorporates multiple drug types	Ability to target different tumours. Allows for site-specific drug delivery
Hydrogel can be imaged by US and CT	Strong focus on clinical translation

TECHNOLOGY READINESS LEVEL

Patent filed (WO2019092049A1)

In vivo POC in mouse Xenograft model