

Research could lead to better understanding of pancreatic cancer

November 9 2018



Axial CT image with i.v. contrast. Macrocystic adenocarcinoma of the pancreatic head. Credit: public domain

Surrey's BioProChem group has developed a biomaterial based complex synthetic tissue, which is aimed at replicating the way pancreatic cancer tumours develop within the body.

The research was published in *Royal Society of Chemistry Advances* in June 2018. It was the result of a three year project led by the BioProChem group within Surrey's Department of Chemical and Process Engineering in collaboration with Imperial College London.

Pancreatic cancer has an extremely low survival rate which has barely improved over the last 40 years. Part of the reason for this is the distinctive microenvironment – the combination of complex chemical, biological, biomechanical and structural factors – found in pancreatic cancer tissues which makes them difficult to treat.

The latest research at Surrey has focused on building a robust polymer-based 3-D structure which mimics features of a [tumour](#) and can be tailored to specific tissue properties of individual patients. This could help doctors to understand how a specific tumour would be likely to spread or to respond to treatment, potentially improving outcomes for pancreatic cancer patients.

Dr. Eirini Velliou, who led the research, said: "The scaffold we have created is very robust: it can remain intact in terms of its mechanical qualities and structure for many months. It also mimics biomechanical features of [pancreatic](#) cancer better than many existing lab systems. We have been able to introduce proteins that are present in [pancreatic cancer](#) which effectively create a shell around the tumour and therefore hugely influence the [cancer](#)'s resistance to treatment.

"Our next step is to introduce biological complexity into the scaffold by introducing healthy cells into the tumour environment. We are also now working on applying different types of treatment in the 3-D scaffolds such as chemotherapy and novel radiotherapy in collaboration with the Ion Beam Centre, the Royal Surrey County Hospital and the National Physical Laboratory. Ultimately, our platform could enable low-cost patient-specific [treatment](#) screening, accelerating therapies from bench

to bed."

The full paper is titled "A 3-D bioinspired highly porous polymeric scaffolding system for in vitro simulation of [pancreatic ductal adenocarcinoma](#)."

More information: Stella Totti et al. A 3D bioinspired highly porous polymeric scaffolding system for in vitro simulation of pancreatic ductal adenocarcinoma, *RSC Advances* (2018). [DOI: 10.1039/C8RA02633E](#)

Provided by University of Surrey

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