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SCIENTIQUIPP

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The use of cell culture
as a personalized treatment tool in pancreatic cancer.

Pancreatic cancer is the fourth leading cause of cancer death in both men and women. Pancreatic cancer accounts for 7% of all cancer deaths. Since the late 1990s, the death rate has very slowly increased by 0.2% per year in men and stayed steady in women. In 2020, an estimated 466,003 people worldwide died from pancreatic cancer. Within pancreatic cancer, one of the most aggressive types is ductal adenocarcinoma (PDAC), which has a 5 year survival rate of only 9%.

Pancreatic Cancer Treatment

Pancreatic cancer is difficult to detect and diagnose for the following reasons:

- There aren't a noticeable signs or symptoms in the early stages of pancreatic cancer.
- The signs and symptoms of pancreatic cancer, when present, are like the signs and symptoms of many other illnesses.
- The pancreas is hidden behind other organs such as the stomach and small intestine, liver, gall bladder, spleen and bile ducts.

Surgery is the curative treatment of choice for patients with PDAC in early stages (20% of cases), while for those patients diagnosed with PDAC in advanced or metastatic stages (80% of cases), the treatment of choice is chemotherapy. However, patients with PDAC present a very heterogenous response to chemotherapeutic agents, which makes it increasingly necessary to develop personalized therapies, directed at each patient.

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3D Preclinical Model

Up until now, different preclinical models have been proposed to test the effect of chemotherapeutic agents in vitro. Such an example is the model based on culturing primary cells in three dimensions (3D), obtained from a resection of a tumour from a patient with PDAC, and testing different chemotherapeutic drugs on the culture, in order to analyse which would be more efficient for each specific case. In short, for this model, tumour cells from a patient with PDAC are processed in the laboratory and cultured in Petri dishes, in collagen-rich medium (3D condition) with nutrients, and with the desired test. After a few days (to be established by the group) the cells are to be collected and analysed.

Collection and Analysis Process

In more detail, for the collection of the cultured cells, the first step consists in removing all the culture medium from the Petri dish, leaving only the cells embedded in the collagen matrix. During the process the appropriate amount of PBS (phosphate-buffered saline) buffer is added to the petri dish and the matrix is mechanically disrupted. The mixture of PBS, matrix and cells is collected and placed in a 50 mL conical tube, which is centrifuged at 300 *g* (RCF) for five minutes at 4°C. Once the centrifugation time has elapsed, the supernatant is discarded and the pelleted cells are resuspended in PBS, repeating the process one more time. Finally after the second stage of centrifugation, the pelleted cells are suspended in complete medium and analyzed.

For these centrifugation steps, it is recommended to use a high quality and efficient centrifuge such as the ROTA 6R V/FM or the ROTA 7R V/FM.

These centrifuges offer optimum performance and versatility. Their powerful refrigeration systems keep the chamber temperature below 4°C, guaranteeing the integrity of the cells during the centrifugation process.



There are multiple rotor options for centrifugation of 50mL tubes, ensuring a precise and reliable result.

Product – Rota 6R V/FM

ROTA 6R V/FM (Refrigerated Centrifuge)
PART NO : 100122

ROTOR : 4X500mL
(Swing-Out Rotor) including adapters
PART NO : 200384

ROTOR : 14x50mL
(Fixed-Angle Rotor) including adapters
PART NO : 200600

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