TECHNISCHE HOCHSCHULE DEGGENDORF

FOXO1

THE ROLE OF FOXO1 AND MICRORNA21 IN THE ANGIOGENESIS OF CCA AND PDAC

Weitere Infos:

Abstract

Projekttitel/ Project title:

Innovative 3D *in vivo* model for solid tumors in cholangiocellular carcinoma and pancreatic cancer: a patient-specific approach

Kurztitel/ Short title:

The role of FOXO1 and microRNA21 in the angiogenesis of CCA and PDAC

Einleitung/ Introduction:

Although pancreatic ductal adenocarcinoma (PDAC) is one of the most widespread malignant diseases and cholangiocellular carcinoma (CCA) is a rare type of cancer, they share aggressiveness, short survival time and resistance to chemotherapy. FOXO1 and microRNA-21 function respectively as tumor suppressor and oncogene in PDAC. Moreover, FOXO1 has an important role in vascular homeostasis because it is a fundamental modulator of the formation and maturation of blood vessels.

Ziel/ Aim:

The first aim of this project is to study the role of the microRNA-21 and FOXO1 in the angiogenesis in pancreatic ductal adenocarcinoma using the chick chorioallantois membrane (CAM) model. The second aim of this project is the cultivation of CCA tumor tissue on the CAM for the first time and subsequently the chemotherapeutic testing on CCA human tumor tissue grown on the CAM.

Methode/ Method:

To study the role of FOXO1 and microRNA-21 in angiogenesis, cell lines are transfected and subsequently grown on the CAM, then the changes in angiogenesis will be monitored by Laser Speckle Contrast Imaging (LSCI) and the expression of angiogenic factors will be determined by western blot and quantitative PCR. In this project CCA primary tumor tissue and tumor spheres are cultured on the CAM, and histological sections are used to analyse possible changes in the tissue. Testing of clinical chemotherapy drugs injected intravenously will be performed on primary tumor tissue grown on the CAM.

Ergebnis/ Result:

As part of preliminary work, the protein expression of FOXO1 was detected using western blotting in different pancreatic cancer and cholangiocarcinoma cell lines. MiaPaCa2 was the pancreatic cancer cell line with the lowest expression of FOXO1. We then performed a stable transfection to overexpress FOXO1 in the pancreatic cancer cell line MiaPaCa2.
In addition, CCA tissue was cultured on the CAM model for the first time and the growth of the tumor tissue was monitored daily macroscopically. Even after a week's growth on the CAM, the typical histological structures of this cancer were preserved and through ultra-high frequency ultrasound the perfusion of CCA tissue cultivated on the CAM was confirmed.

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