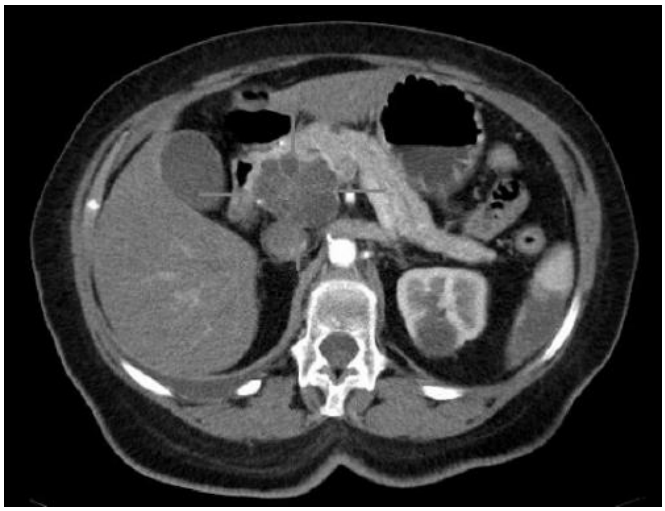
Researchers find novel way to induce pancreatic cancer cell death

10 April 2017



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

Pancreatic cancer, most frequently pancreatic ductal adenocarcinoma (PDAC), is the most lethal and aggressive of all cancers. Unfortunately, there are not many effective therapies available other than surgery, and that is not an option for many patients.

In an effort to better understand pancreatic cancer at a molecular level, scientists at Wake Forest Baptist Medical Center in collaboration with those at the University of Texas M.D. Anderson Cancer Center and Tianjin Medical University General Hospital in China, conducted a study to try to identify molecules that could become the next generation of therapeutics for this type of cancer. Results of their findings are published in the cover article in the April issue of the journal *Autophagy*.

Previous research had shown that micro RNA (MIR506), a small molecule produced in the human body, had functioned as a tumor suppressor in many human cancers and enhanced chemotherapy's effectiveness in ovarian cancer. The researchers hypothesized that this molecule was a viable option for further study in pancreatic cancer. Normally, MIR506 plays an important role in regulating cell behavior; adequate levels help the cells function normally, while decreased levels trigger cell growth and expansion occurring in tumors.

In this study, samples were taken from patients' tumors during surgery and transplanted into mice to grow new pancreatic cancer tumors.

"By using an animal model to expand tumor cells recently removed from patients, we hoped to re-create more closely what actually happens in patients with pancreatic cancer rather than by using existing artificial cell lines," said Wei Zhang, Ph.D., an endowed Hanes and Willis Family Professor in cancer at Wake Forest School of Medicine, a part of Wake Forest Baptist, and principal investigator of the study.

The scientists first observed that levels of MIR506 were lower in the tumor as compared to a normal pancreas. Next they treated the experimental tumor cells with MIR506 to determine if it would behave in the same way it had with ovarian and other cancers. They found that treating the pancreatic cancer cells with MIR506 inhibited both malignant cell growth and the cellular process that causes cancer to metastasize.

More importantly, Zhang and his team for the first time found that treating the pancreatic tumor cells with MIR506 induced autophagy, a process that occurs as a normal and controlled part of an organism's growth or development and that could promote cancer cell death.

"The potential therapeutic value of this finding is important because we could deliver MIR506 directly to pancreatic cancer cells using technologies like

nanoparticles and exosomes," Zhang said. "Hopefully, this will provide us with a new way to fight this deadly form of cancer."

Provided by Wake Forest University Baptist Medical Center