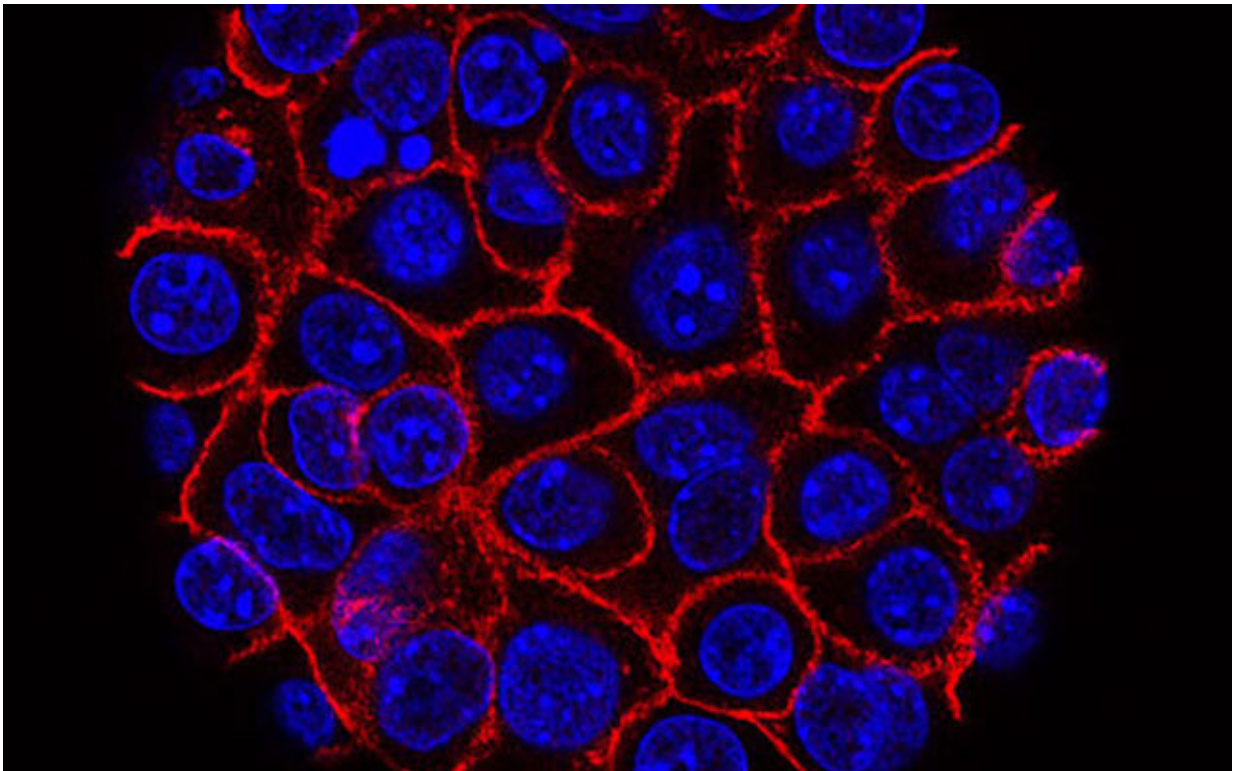# AI may detect earliest signs of pancreatic cancer

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Pancreatic cancer cells (blue) growing as a sphere encased in membranes (red). Credit: National Cancer Institute

An artificial intelligence (AI) tool developed by Cedars-Sinai investigators accurately predicted who would develop pancreatic cancer based on what their CT scan images looked like years prior to being

diagnosed with the disease. The findings, which may help prevent death through early detection of one of the most challenging cancers to treat, are published in the journal *Cancer Biomarkers*.

"This AI tool was able to capture and quantify very subtle, early signs of pancreatic ductal adenocarcinoma in CT scans years before occurrence of the disease. These are signs that the human eye would never be able to discern," said Debiao Li, Ph.D., director of the Biomedical Imaging Research Institute, professor of Biomedical Sciences and Imaging at Cedars-Sinai, and senior and corresponding author of the study. Li is also the Karl Storz Chair in Minimally Invasive Surgery in Honor of George Berci, MD.

Pancreatic ductal adenocarcinoma is not only the most common type of pancreatic cancer, but it's also the most deadly. Less than 10% of people diagnosed with the disease live more than five years after being diagnosed or starting treatment. But recent studies have reported that finding the cancer early can increase survival rates by as much as 50%. There currently is no easy way to find pancreatic cancer early, however.

People with this type of cancer may experience symptoms such as general abdominal pain or unexplained weight loss, but these symptoms are often ignored or overlooked as signs of the cancer since they are common in many health conditions.

"There are no unique symptoms that can provide an early diagnosis for pancreatic ductal adenocarcinoma," said Stephen J. Pandol, MD, director of Basic and Translational Pancreas Research and program director of the Gastroenterology Fellowship Program at Cedars-Sinai, and another author of the study. "This AI tool may eventually be used to detect early disease in people undergoing CT scans for abdominal pain or other issues."

The investigators reviewed [electronic medical records](#) to identify people who were diagnosed with the cancer within the last 15 years and who underwent CT scans six months to three years prior to their diagnosis. These CT images were considered normal at the time they were taken. The team identified 36 patients who met these criteria, the majority of whom had CT scans done in the ER because of abdominal pain.

The AI tool was trained to analyze these pre-diagnostic CT images from people with pancreatic cancer and compare them with CT images from 36 people who didn't develop the cancer. The investigators reported that the model was 86% accurate in identifying people who would eventually be found to have pancreatic cancer and those who would not develop the cancer.

The AI model picked up on variations on the surface of the pancreas between people with cancer and healthy controls. These textural differences could be the result of molecular changes that occur during the development of pancreatic cancer.

"Our hope is this tool could catch the [cancer](#) early enough to make it possible for more people to have their tumor completely removed through surgery," said Touseef Ahmad Qureshi, Ph.D., a scientist at Cedars-Sinai and first author of the study.

The investigators are currently collecting data from thousands of patients at healthcare sites throughout the U.S. to continue to study the AI [tool](#)'s prediction capability.

Provided by Cedars-Sinai Medical Center