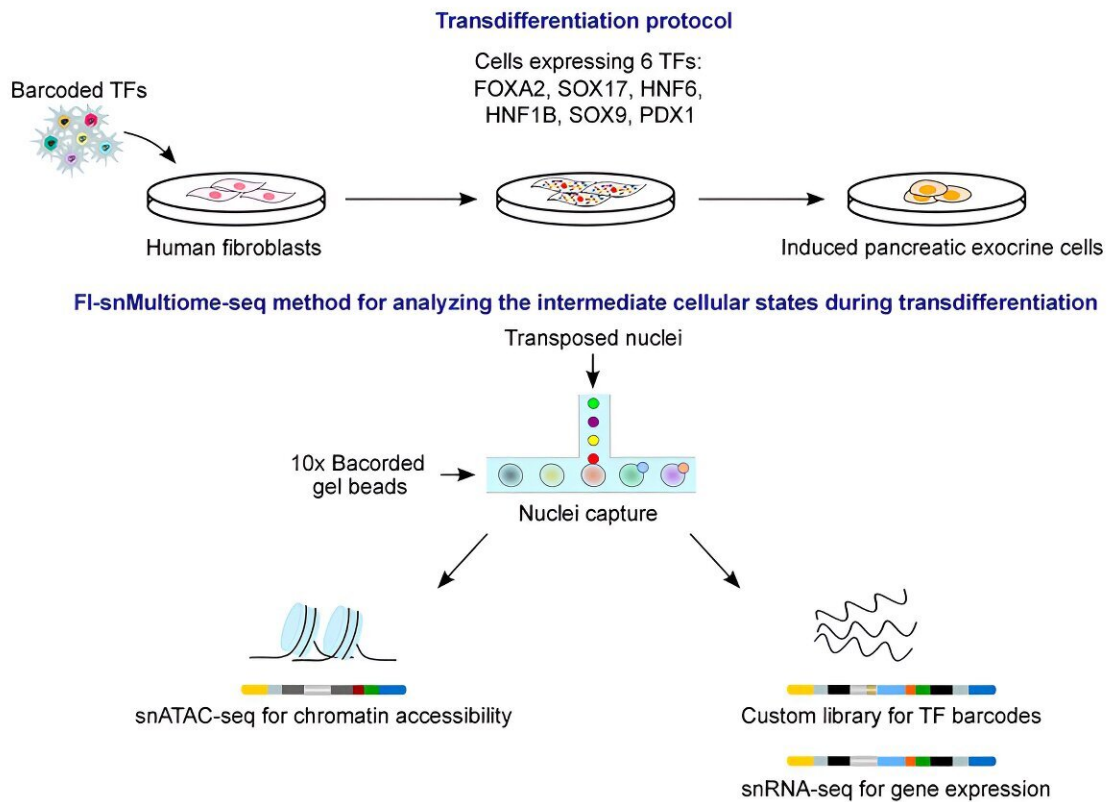


New method makes it easier to research pancreatic cancer

October 5 2023



Graphical abstract. Credit: *Developmental Cell* (2023). DOI: 10.1016/j.devcel.2023.08.023

Pancreatic cancer is one of the deadliest forms of cancer. This is largely due to the cancer being detected at a late stage. In addition, treatment

options for pancreatic cancer are limited.

Therefore, researchers are now working to map out how the cancer develops. Such knowledge can be used to detect the cancer earlier and to develop new treatments. The work has been published in the journal *Developmental Cell*.

"To be able to map out the events that lead to [pancreatic cancer](#) in the lab, we must have access to the cells from which the cancer arises. But taking cells from the pancreas of healthy people is practically not possible," says Biswajyoti Sahu, group leader at the Norwegian Center for Molecular Medicine (NCMM).

Instead, his research group at NCMM and at the University of Helsinki has found a way to make pancreatic cells directly from cells that can easily be obtained, for instance, from our skin.

New method gives researchers unique access to pancreatic cells

"We have developed a new method that allows us to take cells that are easy to grow in the laboratory and convert them into pancreatic cells," says Liangru Fei, one of the main authors of the study.

This gives the researchers unique access to cells that are otherwise difficult to obtain, and which has been a limitation for pancreatic cancer research.

This method can therefore shorten the time it takes to discover new [treatment options](#) for pancreatic cancer. It also enables other research groups to adopt the method and to study this cancer type.

Protective mechanisms against cancer present challenges in the laboratory

Even if the researchers could extract pancreatic cells from healthy people, they would quickly run into challenges.

"Healthy and fully developed cells have a built-in protection mechanism. This usually causes the cell to die if we introduce a cancer-causing gene or mutation into them."

"Thanks to this protective mechanism, most of us avoid developing cancer. But it also makes it challenging to study [cancer development](#) in the laboratory," says Fei.

Therefore, the researchers had to think of an alternative.

Researchers have cracked the code for pancreatic cells

Specialized cells, such as pancreatic cells, are formed from so-called [stem cells](#). Stem cells are cells in our body that can develop into any type of cell.

Even though all our cells contain the same DNA, a pancreatic cell is still very different from, for example, a skin cell. This is because different genes are active when the stem cell develops into either a skin cell or a pancreatic cell.

This is controlled by a group of proteins called [transcription factors](#). These activate the code that determines the very identity of a cell.

Fei and her colleagues have now found the transcription factors that activate the code needed to make a pancreatic cell.

"We have identified six specific transcription factors that we can use to reprogram a completely different cell type into a pancreatic cell," says Fei.

The aim is to map what leads to pancreatic cancer

The researchers will now use this new method to map the development of pancreatic cancer. To trigger cancer development, several critical mutations must occur at specific times during the cell's development. But exactly when and where such mutations occur is not known.

"Mutations happen all the time, but the development of cancer usually requires a series of unfortunate events. In other words not just a single mutation. Fortunately, this makes it relatively rare that we actually develop cancer," says Sahu.

"When we turn the cells into pancreatic cells, we can introduce various cancer-causing molecular changes to the cells along the way. We can then follow what happens to the cells under different conditions and map the events that lead to the development of pancreatic cancer."

Can open many new doors for the development of therapies

In the long term, the researchers hope to use this method to find new targets for the treatment of pancreatic cancer. It also has the potential to uncover ways to detect the cancer earlier.

In addition, the possibility of growing healthy specialized cells in the laboratory can be used for the treatment of tissue damage.

"Our method also has the potential to be used for generating [pancreatic](#)

[cells](#) that can be transferred to patients who suffer from damage in the pancreas. Generating healthy, specialized cells in the laboratory can open many doors for the development of therapies," concludes Sahu.

More information: Liangru Fei et al, Single-cell epigenome analysis identifies molecular events controlling direct conversion of human fibroblasts to pancreatic ductal-like cells, *Developmental Cell* (2023).

[DOI: 10.1016/j.devcel.2023.08.023](https://doi.org/10.1016/j.devcel.2023.08.023)

Provided by University of Oslo

Citation: New method makes it easier to research pancreatic cancer (2023, October 5) retrieved 28 April 2024 from

<https://medicalxpress.com/news/2023-10-method-easier-pancreatic-cancer.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.