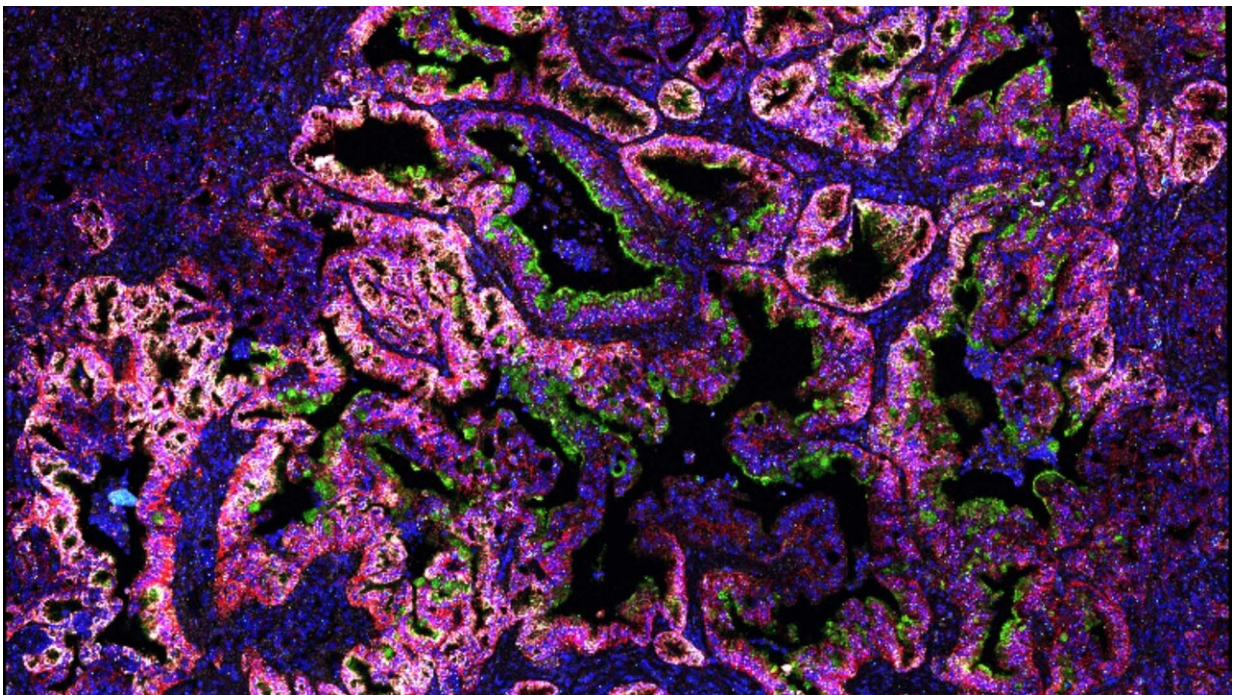


Scientists discover mucus allows young pancreatic cancer cells to grow but may also prevent a deadly transformation

February 28 2024, by Luis Sandoval



A cross-section of a mouse's early-stage pancreatic tumor. CSHL scientists discovered that early pancreatic cancer cells depend on the regulators of mucus production to survive and grow. Green, purple, yellow, cyan, and white denote areas where mucus production is high. Credit: Tuveson lab/Cold Spring Harbor Laboratory

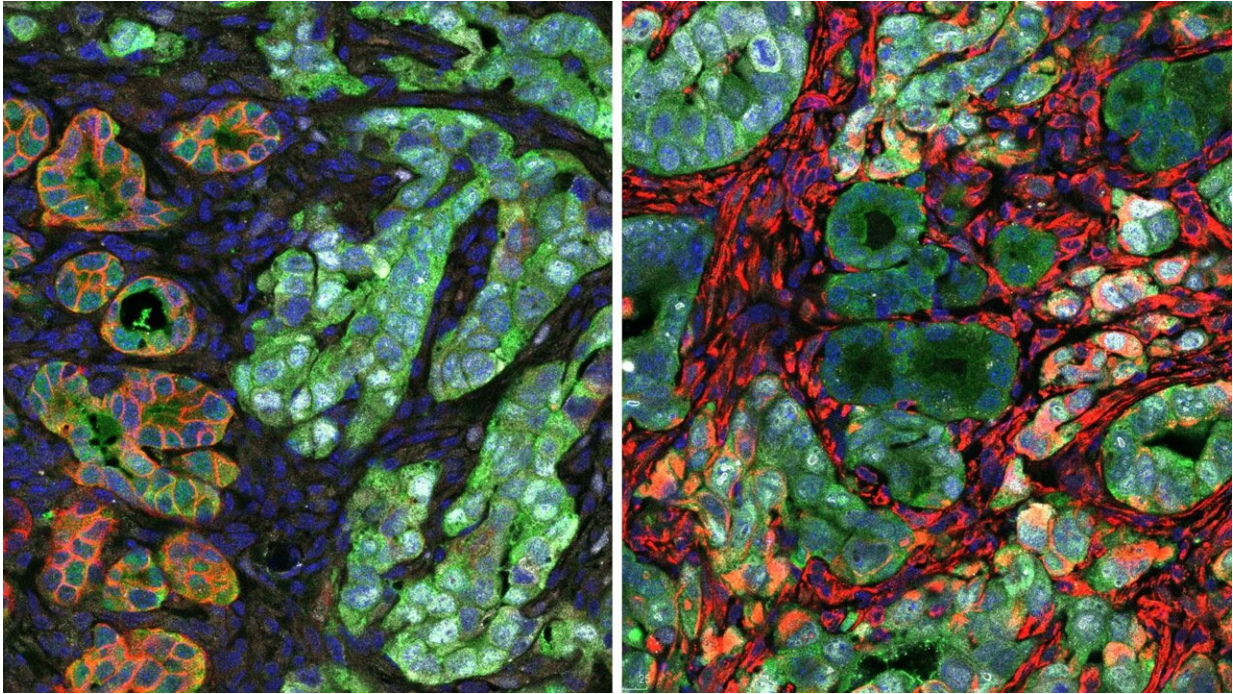
Knowing exactly what's inside a tumor can maximize our ability to fight

cancer. But that knowledge doesn't come easy. Tumors are clusters of constantly changing cancer cells. Some become common cancer variants. Others morph into deadlier, drug-resistant varieties. No one truly understands what governs this chaotic behavior.

Now, Cold Spring Harbor Laboratory (CSHL) Professor David Tuveson and his team have uncovered a mechanism involved in [pancreatic cancer](#) transformation—mucus. During the disease's early stage, pancreatic cancer cells produce mucus. Additionally, these cells depend on the body's regulators of [mucus production](#). This new knowledge could help set the stage for future diagnostic or therapeutic strategies.

The unpredictable, shifting nature of tumors makes it challenging to pinpoint the right treatments for patients. "We need to understand better this concept of cell plasticity and design therapy that takes this into consideration," says Claudia Tonelli, a research investigator in the Tuveson lab who led the study.

To find out what's behind tumors' erratic behavior, Tonelli teamed with Jonathan Preall from CSHL's Single-Cell Biology Facility. Together, the scientists broke down messy clumps of pancreatic tumors into individual cancer cells. From there, they could examine the unique differences between each pancreatic cancer type. And that's where mucus' role in cancer differentiation oozed into view.



Mouse pancreatic tumors have extensive cell heterogeneity, as seen in these cross-sections. The early-stage pancreatic cancer cells (green and red) on the left have a more structured, organized shape. As they transform into a deadlier, drug-resistant variety of cancer cells, they lose that structure, as seen on the right. Credit: Tuveson lab/Cold Spring Harbor Laboratory

Making mucus is messy and challenging for cancer cells. It takes a lot of resources to assemble and export these protein blobs. So why do it in the first place? The scientists discovered that low-grade pancreatic cancer cells of a common variety, known as the classical type, depend on mucus to survive and thrive.

As the cancer cells mature and transform into the deadlier type, known as basal-like, they seem to grow out of this dependency. Tonelli suspects mucus may provide fledgling cancer cells with protection against the immune system.

While therapeutically targeting mucus in young, vulnerable pancreatic cancer cells may have some advantages, it's a double-edged sword. When mucus production is blocked, cancer cells stop growing. But this forces some of them to become the deadlier basal-like cancer cells as a survival mechanism.

"We would have to do further studies to be ready to hit the cancers once they have undergone this differentiation," says Tonelli. "Identifying a combination of therapies may be an option."

Knowing what makes pancreatic [cancer cells](#) transform may someday help researchers discover better therapeutics. So, while mucus might not be the key to cracking pancreatic cancer, the answer might yet be found right under our nose.

The study is [published](#) in the journal *Gut*.

More information: Claudia Tonelli et al, A mucus production programme promotes classical pancreatic ductal adenocarcinoma, *Gut* (2024). [DOI: 10.1136/gutjnl-2023-329839](https://doi.org/10.1136/gutjnl-2023-329839)

Provided by Cold Spring Harbor Laboratory

Citation: Scientists discover mucus allows young pancreatic cancer cells to grow but may also prevent a deadly transformation (2024, February 28) retrieved 27 April 2024 from <https://medicalxpress.com/news/2024-02-scientists-mucus-young-pancreatic-cancer.html>

<p>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.</p>
--