

First screening test for detecting lymph node metastasis in pancreatic cancer patients

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

For years, surgeons have operated on pancreatic cancer patients to remove what they thought was a localized tumor only to discover that the disease had spread to other, inoperable parts of the body. Now, a City of

Hope molecular scientist thinks he may have found a way to prevent ineffective surgeries and prolong the lives of these patients.

Unlike breast, skin or [prostate cancer](#), there is no standard-of-care screening test for [pancreatic cancer](#). And because the pancreas is situated deep within the [abdominal cavity](#), today's imaging technology often doesn't see the pancreatic tumors and are not sensitive enough to detect the minority of cancer cells that have already spread to lymph nodes.

"If we know beforehand that these pancreatic cancer patients have lymph node metastases, we probably would not perform surgery because it's complicated, expensive and, most importantly, patients with lymph node spread don't do well after surgery," said [Ajay Goel](#), Ph.D., M.S., A.G.A.F., chair of the Department of Molecular Diagnostics and Experimental Therapeutics at City of Hope and lead author of the new study.

"Instead, we would likely first treat the patient with chemotherapy to kill all the loose-hanging cells in the lymph nodes and then surgically remove the cancer from the pancreas."

On average the five-year survival rate for people with pancreatic cancer is only 10%, according to the National Cancer Institute. While pancreatic cancer is expected to account for about 3% of all cancer cases in 2020, it likely will be responsible for nearly 8% of cancer deaths this year.

The researchers say City of Hope is the first to perform a comprehensive, genome-wide analysis to identify a novel microRNA biomarker that can be used to detect [lymph node metastases](#) in patients with pancreatic ductal adenocarcinoma, which makes up about 80% of all pancreatic cancer cases.

Published in the journal *Gastroenterology* this month, the study identified microRNA, a type of gene, that is highly expressed in people with metastatic pancreatic cancer. With more investigation, doctors could one day use this biomarker to practice precision medicine. In other words, a simple biopsy would help doctors understand each patient's particular disease and empower them to select the most appropriate treatment and disease management strategies for that patient.

"Lymph node metastasis status remains one of the most important predictors of survival in patients undergoing curative resection and is considered to be of tremendous clinical significance for risk stratification and therapeutic decision-making," according to the study.

To find the novel biomarker, the scientists analyzed data in three public datasets. Then they tested and validated their hypothesis using 373 samples that included pancreatic ductal adenocarcinoma specimens, samples collected from patients before surgery and biopsies taken prior to any chemotherapy treatment. The median follow-up was 5.5 years in the testing or training cohort and 2.8 years for the validation cohort.

It turns out that there are six distinct genes or microRNAs at play: miR-155-5p, miR-196b-5p, miR-365a-5p, miR-629-5p, miR-675-3p and miR-92b-3p. A quality assurance test showed that the scientists' proposed screening test had an accuracy level of 78%.

"This may not seem like a high percentage but in a clinical setting, especially when we don't currently have a pancreatic cancer screening tool, this accuracy level has few equals," Goel said.

Now that Goel and colleagues have created the proof-of-concept biopsy screening test for the presence of lymphatic metastasis in pancreatic cancer, they want to develop the first blood draw test that they hope will identify when [pancreatic cancer](#) has spread to [lymph nodes](#). A blood

screening test is a less invasive way to deliver personalized therapy. He's already working on it and says more potential clinical innovations are coming soon.

More information: Satoshi Nishiwada et al, A microRNA Signature Identifies Pancreatic Ductal Adenocarcinoma Patients at Risk for Lymph Node Metastases, *Gastroenterology* (2020). [DOI: 10.1053/j.gastro.2020.04.057](https://doi.org/10.1053/j.gastro.2020.04.057)

Provided by City of Hope

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