

## Researchers find biomarkers in saliva for detection of early-stage pancreatic cancer

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Physicians and scientists agree: If we cannot entirely prevent cancer, the next best thing is to find it earlier to augment the chances of a successful fight.

The good news is that there may soon be a new weapon in the battle against the so-called "worst" cancer — cancer of the pancreas. A multidisciplinary group of investigators from the UCLA School of Dentistry, the David Geffen School of Medicine at UCLA, the UCLA School of Public Health and UCLA's Jonsson Comprehensive Cancer Center has demonstrated the usefulness of salivary diagnostics in the effort to find and fight the disease.

Their results, published by the journal *Gastroenterology*, are available online at <http://dx.doi.org/10.1053/j.gastro.2009.11.010>.

Pancreatic ductal adenocarcinoma, the most common type of cancer of the pancreas, is also the most lethal of all cancers, with a mortality rate that is approximately the same as the rate of incidence. The American Cancer Society reports that more than 42,000 people in the United States received a diagnosis of pancreatic cancer in 2009, and the disease caused more than 35,000 deaths. Pancreatic cancer is the fourth leading cause of cancer death in this country. For both men and women, the lifetime risk of developing pancreatic cancer is about one in 72.

A "silent killer," pancreatic cancer produces its typical symptoms — abdominal pain and jaundice — only in the advanced stage of the

disease, making it difficult to fight. Fewer than 5 percent of those diagnosed with the disease live for five years, and full remission is very rare, according to the World Health Organization.

"Worldwide, the prevalence of pancreatic cancer is so high, and the disease is so deadly, that it calls out for a reliable means of early diagnosis," said the study's senior investigator, David Wong, D.M.D., D.M.Sc., UCLA's Felix and Mildred Yip Professor of Dentistry and associate dean of research at the dental school. "The ability to implement safe, cost-effective, widespread screening could be the answer to saving thousands of lives each year — and that is what we are after."

In the past few years, technological advances have pushed the concept of salivary diagnostics for systemic disease to the forefront of scientific attention.

"David Wong and his team at the dental school have demonstrated the usefulness of saliva in detecting oral cancer," said co-first author James Farrell, M.D., an associate professor in the UCLA Division of Digestive Diseases and director of the Pancreatic Diseases Program at UCLA. "As a clinician-scientist who manages patients with all stages of pancreatic cancer, I was eager to work with them to explore the possibilities it could yield in diagnosing this disease."

In the study, the researchers successfully linked changes in the molecular signatures found in human saliva to the presence of early-stage pancreatic cancer.

By analyzing altered gene expression, the researchers identified four messenger RNA (mRNA) biomarkers — KRAS, MBD3L2, ACRV1 and DPM1 — that differentiate pancreatic cancer patients from non-cancer subjects (both those diagnosed with chronic pancreatitis and healthy controls) with 90 percent sensitivity and 95 percent specificity.

"Our recent findings underscore the potential for salivary diagnostics to play a pivotal role in the detection of systemic cancers and diseases," said Lei Zhang, Ph.D., an assistant researcher at the UCLA School of Dentistry Dental Research Institute and co-first author of the study.

"Not only are these saliva-based diagnostic methods for pancreatic cancer simple and noninvasive, they may also represent an improvement in specificity and sensitivity over currently used procedures, such as blood tests, for early [pancreatic cancer](#) detection," Farrell said.

Due to the study's modest sample size of 90 human subjects, the researchers acknowledge limitations, yet express enthusiasm for further research. They are formulating plans to test the salivary biomarkers in a larger population in a multicenter study. And they note that the potential for salivary mRNA biomarkers to identify very early-stage and even pre-invasive pancreatic [cancer](#) requires further investigation.

Provided by University of California - Los Angeles

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