

# TARGETING CANCER'S *weak points*

The biological processes that underlie pancreatic cancer could also be the disease's Achilles' heel. Scientists at City of Hope delve into the molecular mechanisms of cancer — work that may lead to life-extending and lifesaving therapies of the future.

Our researchers are analyzing pancreatic cells on the verge of turning cancerous to better understand how they move from benign to malignant. Their focus: a signaling pathway that is inactive in healthy cells but switched on in precancerous cells. In lab experiments, our team has found that the pathway helps these abnormal cells multiply. We aim to understand more about how this pathway is involved with the progression to cancer and whether it is related to a mutation common in gastrointestinal cancers. At the same time, City of Hope scientists use powerful computers to model molecules that could block this pathway — a step toward drugs that may undermine pancreatic cancer.

In other investigations, City of Hope researchers advance an approach that could lead to personalized treatment. About half of all pancreatic cancer patients have a particular genetic mutation that is detectable with a blood test. Our scientists believe that a drug currently in testing for lung cancer may prove effective in treating pancreatic cancer patients with the mutation. Further research could accelerate progress toward the day when doctors can pinpoint the best method for treating individual patients based on their genetic profiles.

City of Hope also is leading the way in studying a protein called STAT3 that helps tumors develop and grow.

Scientists are investigating the role this protein plays in pancreatic cancer. We seek to identify drugs that can attack pancreatic cancer by sabotaging the activity of STAT3 and related signaling pathways. This research may result in drugs that target the disease while avoiding the kind of side effects associated with chemotherapy today.

## **INNOVATIVE COLLABORATIONS**

A protein called p53 usually helps the body regulate the growth of cells and keep cancer in check. But a mutant form of that protein can actually help cancer develop, and it is found in high concentrations in about 40 percent of all pancreatic cancers. In a collaboration uniting our laboratory scientists and clinicians, City of Hope has developed a therapeutic vaccine that could awaken patients' natural defenses to attack cancer cells that have an abundance of mutant p53. In lab experiments, this promising vaccine shrank and even killed tumors. As our researchers move their vaccine into human trials, they advance an innovative approach that may help tame pancreatic cancer.

Another collaboration brings together scientists from City of Hope and the California Institute of Technology to try to overcome pancreatic cancer's resistance to chemotherapy. In clinical trials, the research team uses tiny, injected molecular machines called nanoparticles to deliver an anticancer medicine directly to tumor cells. If successful, these studies may lead to pancreatic cancer therapy that is both gentler on patients and more effective in fighting the disease.

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## **HELP US CONQUER CANCER**

By donating to City of Hope, you can speed the course of science and support studies that find cures faster — saving more lives worldwide.

Our development staff is eager to show you how you can help us achieve our lifesaving mission.

Please contact our Development Center at 800-232-3314 or [giftplanning@coh.org](mailto:giftplanning@coh.org).



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