Pancreas Cancer Disease-Oriented Research Team

HUNTSMAN CANCER INSTITUTE
UNIVERSITY OF UTAH

Pancreatic cancers arise in most cell types of the pancreas, including acinar cells, duct cells, and neuroendocrine cells. Pancreatic ductal adenocarcinoma, the most prevalent pancreatic cancer, is one of the most lethal of all cancer types.

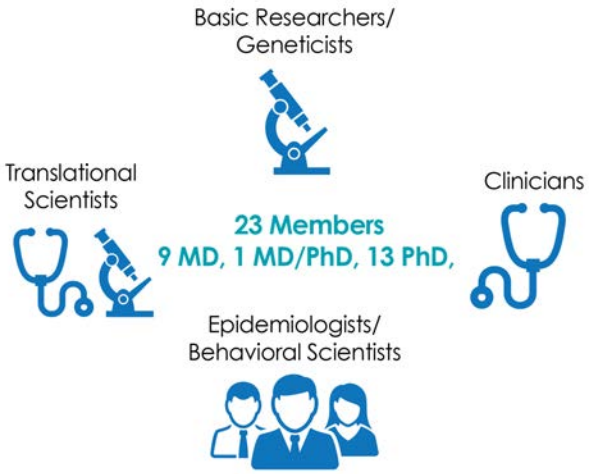
Pancreas Team members conduct research to improve understanding and management of pancreas cancers.

Researchers and clinicians in the Pancreas Team seek to:

- Identify cellular functions that, if defective, result in pancreas cancers
- Develop effective diagnostics, treatments, and imaging approaches for pancreas cancers
- Characterize inherited factors that increase risk for pancreas cancers
- Develop animal models of pancreas cancers, to enable research focused on the disease
- Develop strategies to prevent pancreas cancers
- Improve quality of life for pancreas cancer sufferers and survivors

The Team takes a collaborative approach:

- **Basic scientists** study how cells become cancer.
- **Geneticists** study how changes in DNA increase cancer risk.
- **Translational scientists** develop new clinical tools to better treat patients.
- **Clinicians** test new drugs and protocols with the goal to improve patient care.
- **Epidemiologists** explore cancer risk in whole populations of people.
- **Behavioral scientists** study communication and quality of life.



Philanthropic, extramural, and institutional funds support the Pancreas Team infrastructure, such as databases and tissue biobanking, as well as early-stage research projects.
To support Huntsman Cancer Institute research: www.huntsmancancer.org/giving

Current Projects

Identifying biomarkers for pre-malignant and early stage pancreas cancer

Improving outcomes through early detection

Pancreas cancer is frequently diagnosed too late for treatments to be effective. A screening method that could achieve earlier detection of the disease would improve patient outcomes. The HCI Pancreas Team is investigating a set of biomarkers that are diagnostic for pancreas cancer, using the Pancreas Team's robust collection of clinically-annotated patient biospecimens, each linked to outcomes information. The Team is extending this research to identify biomarkers in pre-cancerous lesions. In the past year, they have expanded the project to accommodate the recent understanding that pancreatic ductal adenocarcinoma can be sub-divided into four discrete types of cancer. Biomarkers that permit sub-type classification will allow a personalized approach to disease management.

Investigating how genetic reprogramming leads to pancreas cancer progression

Using biology of the normal pancreas to understand changes that drive cancer

By studying normal gene expression in the pancreas, the Pancreas Team hopes to contribute to therapies that encourage pancreas regeneration following pancreatitis or to identify ways to stop abnormal cell growth in pancreas cancer. Two projects are focusing on the role of regulatory proteins in the initiation and progression of pancreas cancer using Team expertise in developing animal models, as well as the Team's exceptional clinical biospecimen collection. Other studies are characterizing the risk of pancreatic cancer conferred by mutated genes. These findings indicate unexpected overlap between genetic risk factors for breast, ovarian, colon, and lung cancer.

Investigating novel imaging techniques to help diagnosis and disease management

Improved pancreas imaging will aid in early detection and assist with clinical decisions

Techniques such as PET/CT and MRI are non-invasive ways to obtain images of the pancreas. The Pancreas Team has several active research projects focused on enhancing these techniques to better enable pancreas cancer diagnosis and management: 1) a clinical trial that will use multi-tracer PET/CT imaging to identify patients likely to respond to gemcitabine, 2) a pilot project seeking to identify PET agents that increase imaging resolution, and 3) a project to engineer an intragastric MRI coil (with placement much closer to the pancreas) to increase imaging resolution, perhaps to the level of identifying small pre-cancerous pancreatic lesions.

Newly awarded project funding

Using molecules in the blood to detect pancreatic cancer at an early stage

This pilot project will identify biomarkers in the blood that are present due to pancreatic cancer initiation and progression, using a unique mouse model of pancreatic ductal adenocarcinoma (PDAC). These mice go through the same histologic progression of disease as in the most common type of human pancreatic cancer. Recently, these researchers showed that tumor initiation and progression in the mouse model is dramatically accelerated by knockout of *pancreatic-specific transcription factor 1* (*PTF1A*), a key differentiation factor. This work further establishes loss of differentiation as a rate-limiting step in PDAC development.

Slowing down cancer's metabolism

Cancer cells need an unlimited supply of building blocks to maintain their rapidly proliferating state. Two cellular processes in cells support cancer's usual metabolic requirements: 1) activation of a biochemical pathway that results in intense energy production and 2) increased disassembly of unnecessary or dysfunctional components, resulting in cellular recycling. Inhibition of either process individually has not shown been successful in fighting cancer. A Pancreas Team group will study whether concurrent inhibition of the two processes will inhibit cancer proliferation.

Leadership and Team Members

Courtney L. Scaife, MD, is a Professor of Surgery at the University of Utah who specializes in the care of patients requiring surgical treatment related to gastrointestinal oncology. Dr. Scaife earned her undergraduate degree from DePauw University and medical degree from the University of Wisconsin. Her general surgery residency was done at the University of Utah, followed by a two-year fellowship in surgical oncology at the University of Texas MD Anderson Cancer Center. Dr. Scaife's surgical focus involves diseases of the liver, pancreas, and gastrointestinal tract. She has received numerous research grants and participates with other colleagues in research in the areas of diagnosis and treatment of cancer, particularly pancreas cancer.

L. Charles Murtaugh, PhD, is an Associate Professor in the Department of Human Genetics at the University of Utah and a member of the HCI Cell Response and Regulation Program. In his research, Dr. Murtaugh aims to understand how mature cells in the pancreas adopt and maintain their functions, and how this process of differentiation is disrupted in pancreatic diseases, including cancer. Dr. Murtaugh received his PhD from Harvard Medical School and completed a postdoctoral fellowship at Harvard University. He has received several grants for his research on pancreas development and disease.

Matthew A. Firpo, PhD, is a Research Associate Professor in the Department of Surgery at the University of Utah; he directs the Surgery Research Laboratories. He is a member of the HCI Experimental Therapeutics Program. Dr. Firpo's cancer research interests focus on improving intervention and detection strategies for pancreatic cancer. In collaboration with multiple cancer investigators, he investigates the underlying biology of pancreas cancer, with the goal to improve clinical care and patient outcomes.

Pancreas Team Members

Douglas Adler, MD	Gastroenterologist interested in gastrointestinal cancer and endoscopic therapy
Kajsa Affolter, MD	Pathologist specializing in gastrointestinal cancers
Philip Bernard, MD	Researcher developing tests for cancer prognosis and treatment
Ken Boucher, PhD	Biostatistician interested in data analytics and cancer modeling
Lisa Cannon-Albright, PhD	Epidemiologist interested in cancer predisposition genetics
Matt Firpo, PhD	Pancreas Team Co-Leader; researcher interested in intervention and detection strategies for pancreas cancer
Ignacio Garrido-Laguna, MD, PhD	Researcher/oncologist focused on improving diagnosis and treatment of pancreatic ductal adenocarcinoma
Glynn Gilcrease, MD	Oncologist specializing in gastrointestinal cancers and early phase clinical trials and drug development
Jennifer Granger, PhD	Researcher focused on the development of new cancer detection strategies
Rock Hadley, PhD	Researcher engineering improved imaging modalities
Dan Kadrmas, PhD	Researcher interested in cancer physiology in relation to imaging
Martin McMahon, PhD	Translational researcher interested in novel cancer intervention strategies
Kathryn Morton, MD	Researcher/radiologist interested in novel imaging strategies
Sean Mulvihill, MD	Surgeon interested in pancreas cancer diagnosis and treatment
Charlie Murtaugh, PhD	Pancreas Team Co-Leader; researcher in pancreas development and its role in cancer
Marc Porter, PhD	Researcher focused on the use of nanotechnology for cancer biomarker assay development
Jody Rosenblatt, PhD	Researcher interested in epithelial cell biology
Jewel Samadder, MD, MSc	Gastroenterologist focused on hereditary gastrointestinal cancer and endoscopic oncology
Courtney Scaife, MD	Pancreas Team Co-Leader; surgical oncologist interested in cancer diagnosis and treatment
Jill Shea, PhD	Researcher interested in preclinical imaging and therapeutics
Sean Tavtigian, PhD	Researcher interested in identifying genetic susceptibility to cancer
Neli Ulrich, PhD, MS	Epidemiologist interested in cancer prevention and prognosis
John Weis, MD	Oncologist specializing in treatment of gastrointestinal cancers