

2018 Funded Research Projects

SITEMAN CANCER CENTER

The Role of ZFH4 in the Glioblastoma Tumor Propagating Cell State

Goal: To understand how a gene (ZFHX4) contributes to the treatment-resistant state of glioblastoma. This information will help us develop new treatments for brain tumors

Principal Investigator: Milan Chheda, MD

Antipsychotics and Breast Cancer

Goal: To gather and analyze a large data set of women who have taken antipsychotic and mood stabilizing drugs to determine which drugs are associated with an increased rate of breast cancer.

Principal Investigator: Tahir Rahman, MD

Obesity as an Obstacle to Cancer Immunotherapy

Goal: To understand how obesity influences immunotherapy treatment outcomes for cancer patients and provide fresh insight for improved treatment options for all patients

Principal Investigator: Ryan Teague, PhD, Saint Louis University

Using Arginine Metabolism to Treat Sarcomas

Goal: To test a therapy based on cancer cell metabolism that causes tumor starvation in a clinical trial in rare tumors called sarcomas.

Principal Investigator: Brian Van Tine, MD, PhD

Role of PrimPol in BCRA1-Deficient Tumors

Goal: To study how ovarian cancers carrying BRCA1-gene mutations cope with chemotherapy treatment preventing cell death and ultimately develop a new strategy for chemotherapy.

Principal Investigator: Alessandro Vindigni, PhD, Saint Louis University

Imaging PARP Levels to Predict DNA-Damaging Agent Treatment Responses in Pancreatic Cancer

Goal: To develop a new PET imaging tool to more accurately identify when pancreatic cancers would benefit from the addition of a PARP inhibitor (an emerging anticancer therapy) to standard chemotherapy.

Principal Investigator: Delphine Chen, MD and Andrea Wang-Gillam, MD

NEK9-MAP2K4: A Novel Signaling Axis Promoting Breast Cancer Growth and Chemotherapy Resistance

Goal: To understand the importance that two enzymes have in triple-negative breast cancer (TNBC) growth and their roles in causing resistance to different chemotherapy drugs used for treating TNBC.

Principal Investigator: Cynthia Ma, MD, PhD and Jason Held, PhD

Combined Ketogenic Diet and BCNU for Recurrent Pediatric Brain Tumors

Goal: To perform a first-in-kind clinical trial to determine whether a ketogenic diet can improve outcome when combined with chemotherapy for children with recurrent brain tumors.

Principal Investigators: Josh Rubin, MD, PhD; Joseph Ippolito, MD, PhD; and Liu Lin Thio, MD, PhD

Pilot implementation and Feasibility Assessment: Multilevel Intervention to Reduce Rural Colon Cancer Disparities

Goal: To develop a multi-level intervention in order to improve colon cancer screening and follow-up in primary care clinics in rural Southern Illinois.

Principal Investigator: Aimee James, PhD, MPH

Retinoid Therapy in Acute Myeloid Leukemia

Goal: To determine if two existing acute myeloid leukemia (AML) drugs are more effective when administered in combination with each other using mouse and human models.

Principal Investigator: John Welch, MD, PhD

Oral Microbiome, Virome, and Barrett's Esophagus

Goal: To better understand the relationship between bacteria in one's oral cavity and their future risk of developing Barrett's Esophagus and Esophageal Adenocarcinoma.

Principal Investigator: Yin Cao, ScD, MPH

Radio-Sensitization by Free Fatty Acid Supplementation in Cervical Cancer

Goal: To explore why obese patients treated with radiation therapy for cervical cancer have better response rates than patients who are not obese with the ultimate goal of identifying a dietary supplement or drug that can be given to patients to promote better treatment responses.

Principal Investigator: Julie Schwarz, MD, PhD

Intravenous Lidocaine for Preventing Oxaliplatin-induced Peripheral Neuropathy (OIPN)

Goal: To determine if lidocaine can reduce the occurrence and severity of oxaliplatin-induced peripheral neuropathy, a painful common side effect of chemotherapy.

Principal Investigator: Simon Haroutounian, PhD, MSc

PEDAL THE CAUSE

2018 Funded Research Projects

SITEMAN CANCER CENTER (CONT.)

Genomic Classification and Targeted Immunotherapy of Disseminated Tumor Cells (DTCs) in Breast Cancer Patients

Goal: To better understand how to develop new therapies to eliminate disseminated tumor cells in triple negative breast cancer patients in order to prevent the breast cancer from metastasizing.

Principal Investigator: Rebecca Aft, MD, PhD; Mark Watson, MD, PhD; and, Leonel Hernandez-Aya, MD

Advancing Therapies for Incurable Lymphomas via Translational Team Science

Goal: To develop and evaluate new treatments for patients with incurable lymphomas.

Principal Investigator: Todd Fehniger, MD, PhD; Brad Kahl, MD

ST. LOUIS CHILDREN'S HOSPITAL

High-throughput, Large-scale Functional Genomics of Genetic Variation in Pediatric Cancer

Goal: Advances in sequencing technology are fueling the rapid discovery of genetic variants in cancer, but the ability to interpret whether or not these variants actually affect the function of the encoded protein is often challenging. Instead, "look-up" tables are needed to provide physicians information about the functional impact of any possible genetic variant. We have pioneered several high-throughput functional methods and propose to refine and implement these tools to generate these tables for two important pediatric cancer genes, TP53 and SMAD4. Proposed specific aims:

- Leverage advances in DNA mutagenesis and DNA sequencing to perform Deep Mutational Scans to study the effects of all possible gene variants affecting the protein sequences of TP53 and SMAD4.
 - Perform additional detailed assays on all possible protein sequence mutants in TP53, and use machine learning algorithms to develop classifiers to more accurately predict variant pathogenicity.
- The results of these high-throughput functional studies will be immediately useful for patient care, and could also identify patient-specific novel therapeutics.

Principal Investigators: Dustin Baldrige, MD, PhD; Barak Cohen, PhD; Christina Gurnett, MD, PhD; Malachi Griffith, MD, PhD; Obi L. Griffith, PhD; Joshua B. Rubin, MD, PhD

Prevention of Sensory Pathology Following Cisplatin Chemotherapy

Goal: Cisplatin chemotherapy is widely used in the treatment of pediatric cancers, but it also causes both hearing loss (ototoxicity) and nerve damage (neuropathy) in a high percentage of treated patients. The cellular mechanisms underlying these pathologies are poorly understood. Our studies will use novel zebrafish models of ototoxicity and sensory neuropathy to address the following three aims:

- Determine whether the circadian clock within sensory cells influences their susceptibility to cisplatin.
- Establish whether pre- or co-treatment with the corticosteroid dexamethasone can reduce sensory pathology caused by cisplatin.
- Perform a high-throughput screen of FDA approved drugs and bioactive compounds aimed at identifying small molecules that can either prevent or reverse neuronal damage caused by cisplatin.

The results could lead to improved approaches to reduce and/or treat ototoxicity and nerve damage in children undergoing chemotherapy with cisplatin.

Principal Investigator: Mark Warchol, PhD and Lavinia Sheets, PhD

It takes world-class research to create a world without cancer. Thank you for supporting Pedal the Cause and helping to fund the best and brightest ideas in cancer research.

A full description of Pedal the Cause-funded research projects are available on our website: pedalthecause.org/ptc-funded-research-projects



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Sept. 28 & 29, 2019

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