GRANT SNAPSHOT

2014 Pancreatic Cancer Action Network – AACR Pathway to Leadership Grant

Grantee:	Gina DeNicola, PhD
Institution:	Weill Medical College of Cornell University
Research Project:	*Therapeutic targeting of NRF2-regulated metabolism in pancreatic cancer*
Award Period:	July 1, 2014 – June 30, 2019
Amount:	$600,000

Biographical Highlights

Dr. DeNicola is a postdoctoral fellow in the laboratory of Lewis Cantley, PhD. Dr. Cantley is also the co-principal investigator for a 2014 Research Acceleration Network Grant. In addition, another postdoctoral fellow in Dr. Cantley's lab, Costas Lyssiotis, PhD, received a Pathway to Leadership Grant from the Pancreatic Cancer Action Network in 2013. Dr. DeNicola obtained a bachelor's degree in Biochemistry and Molecular Biology at the Pennsylvania State University and a doctoral degree in Cell and Molecular Biology at the University of Pennsylvania. Dr. DeNicola's graduate studies took place in the lab of David Tuveson, MD, PhD, recipient of a 2003 Career Development Award and member of the Pancreatic Cancer Action Network's Emeritus Scientific Advisory Board.

During her graduate years in the lab of Dr. Tuveson, Dr. DeNicola identified and characterized the regulation of the NRF2 transcription factor by the oncogene K-RAS in mouse models of pancreatic cancer and human tumor samples. She then joined the lab of Dr. Cantley to study the regulation of cellular metabolism by NRF2 and the therapeutic implications of inhibition of NRF2-regulated metabolism for the treatment of cancers with high NRF2 activity.

Project Overview

Dr. DeNicola's research focuses on a protein called NRF2. NRF2 is a transcription factor, which means that its role is to regulate expression of specific genes within a cell. Dr. DeNicola's previous work showed that NRF2 is activated by mutant K-RAS in pancreatic cancer cells. Among other functions, NRF2 has been shown to be involved in metabolic pathways in the cell – ways in which nutrients are broken down to provide energy for cellular functions. NRF2 stimulates the breakdown of sugar into molecules called amino acids (serine and glycine) that are building blocks for proteins.

Dr. DeNicola's project, that will span the remainder of her training in Dr. Cantley's lab and then continue as she transitions into an independent position, will focus on gaining a deeper understanding of the biology of NRF2 activity in pancreatic cancer cells. She will determine whether protein components or byproducts of the pathway could be useful as biomarkers of disease, and/or whether the metabolic process driven by NRF2 could be inhibited as a strategy to block pancreatic cancer growth. Overall, these studies could improve the understanding, detection, and treatment of pancreatic cancer.