# GRANT SNAPSHOT

## 2011 Tempur-Pedic® Retailers – Pancreatic Cancer Action Network – AACR Career Development Award

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| Grantee: | Kenneth Olive, PhD |
| Institution: | Columbia University |
| Research Project: | *The Role of HIF1 and Hypoxia in Pancreatic Ductal Adenocarcinoma* |
| Award Period: | July 1, 2011 – June 30, 2013 |
| Amount: | $200,000 |

## Biographical Highlights

Dr. Olive is currently an Assistant Professor of Medicine and Pathology at the Herbert Irving Comprehensive Cancer Center at Columbia University Medical Center. He has held this position since 2010. Prior to joining the faculty at Columbia, Dr. Olive received his PhD at Massachusetts Institute of Technology, where he worked in the laboratory of Tyler Jacks, PhD. Dr. Jacks is a premiere expert in mouse models of cancer. From there, Dr. Olive joined the laboratory of David Tuveson, MD, PhD, as a postdoctoral fellow. Dr. Tuveson, Pancreatic Cancer Action Network Scientific Advisory Board chair, was also a recipient of a 2003 Pancreatic Cancer Action Network – AACR Career Development Award. Dr. Olive initially worked with Dr. Tuveson at the University of Pennsylvania, and then followed the laboratory to the University of Cambridge.

Dr. Olive received strong training in mouse models of cancer biology from Drs. Jacks and Tuveson. Currently, he works to utilize these advanced genetically engineered mouse models of cancer and small animal imaging technologies to perform preclinical trials, or experiments taking place in mice in preparation for human clinical trials. His laboratory is working to build a bridge from basic science principles, through translational research, and into the clinic.

## Project Overview

Angiogenesis is a process by which cancer cells create their own blood supplies, or vasculature, to provide nutrients and oxygen to the densely-packed tumor. There have been a great deal of attention and research devoted to tumor angiogenesis, and inhibitors of this process have shown modest success in several cancer types. However, accumulating data are showing that pancreatic tumors do not undergo an angiogenic process. In fact, pancreatic tumors are known to be very poorly vascularized, and the cells exist under quite low oxygen conditions, known as hypoxia.

Dr. Olive's funded project will examine this hypoxic phenomenon in pancreatic cancer mouse models. These mice are genetically programmed to develop pancreatic cancer, and follow the same disease progression as observed in humans. A family of proteins involved in the cell's response to hypoxia is called hypoxia-inducible factors, or HIF. Dr. Olive will focus on a member of that family, known as HIF-1a, and determine its role in regions of the tumor under low- and normal-oxygen conditions. Another feature of pancreatic tumors is a dense tissue surrounding the tumor, known as its microenvironment. This microenvironment has been shown to help support and protect the tumor, and also prevents oxygen delivery. An important regulator of the microenvironment is a protein called Hedgehog. Dr. Olive will examine the relationship between Hedgehog and HIF-1a signaling. Ultimately, these studies could yield a deeper understanding of the development of pancreatic cancer, the conditions under which the tumor cells thrive, and potential future targets for therapeutic manipulation.