GRANT SNAPSHOT

2008 Laurie and Paul MacCaskill – Pancreatic Cancer Action Network – AACR Career Development Award

Grantee:	Lorenzo F. Sempere, PhD
Institution:	Dartmouth Medical School, Hanover, NH & Dartmouth-Hitchcock Medical Center, Lebanon, NH
Research Project:	*Role of MicroRNAs in Initiation and Progression of Pancreatic Cancer*
Award Period:	July 1, 2008 – June 30, 2010
Amount:	$100,000

Biographical Highlights

Dr. Sempere received his PhD in Genetics at Dartmouth Medical School, where he continued to complete postdoctoral training in the Department of Biochemistry. He is currently an Instructor of Medicine at Dartmouth-Hitchcock Medical Center. Last year, a close relative of his died of pancreatic cancer within a month of diagnosis. Although she had experienced some minor health issues associated with her diabetes, nothing suggested cancer. Dr. Sempere's research is dedicated to her memory and to the hope that his work may provide new tools for early detection and treatment of this stubborn and aggressive disease.

Project Overview

The funded project examines the role of microRNAs (miRNAs) in the ignition and progression of pancreatic cancer. miRNAs are a recently discovered class of unusual and very short genes. They do not code for proteins and hence are referred to as noncoding RNAs. Almost a thousand miRNAs have been discovered in the human genome and each miRNA is thought to block protein production of a large number of different target genes. Therefore, miRNAs are thought to regulate key processes that keep the cells in check and prevent them from developing cancer.

Recent reports have shown that there are changes in the levels of miRNAs between normal and tumor tissues of patients suffering from different types of cancer, including pancreatic cancer. The funded study will use a special staining technique called "in situ hybridization" (ISH) to identify exactly where changes of specific miRNAs occur in the pancreas of mouse models that develop pancreatic cancer. Since pancreatic tissue is composed of different cell types and only some of these cells are susceptible to develop cancer, it is important to know if these miRNA changes occur within the cancer-prone cells. If so, the study will determine whether neutralizing these miRNA changes affect the growth and survival properties of the cancer cells.

A functional analysis will be conducted of selected miRNAs aimed at assessing: (1) the onset and magnitude of miRNA expression changes by ISH analysis during disease progression in these mouse models; and (2) the contribution of individual miRNAs to pancreatic tumorigenesis by manipulating levels of miRNA expression activity in murine pancreatic cancer cell lines and directly in the pancreas of these mouse models.