GRANT SNAPSHOT

2009 Pancreatic Cancer Action Network – AACR Fellowship

Grantee:	David T. Ting, MD
Institution:	Massachusetts General Hospital
Research Project:	Characterizing Circulating Tumor Cells in Pancreatic Cancer
Award Period:	July 1, 2009 – June 30, 2010
Amount:	$45,000

Biographical Highlights

After receiving his B.S. in chemical engineering and biology from the Massachusetts Institute of Technology Dr. Ting completed his medical degree at Harvard Medical School and his residency in internal medicine at Massachusetts General Hospital. Currently, he is a medical oncology fellow in the combined Dana Farber Cancer Institute and Massachusetts General Hospital Cancer Center program. He became involved in pancreatic cancer research because of the many experiences he has had dealing with this disease as a physician as well as a friend. His research focuses on characterizing circulating tumor cells in pancreatic cancer in order to develop new methods to combat this deadly disease.

Project Overview

Circulating tumor cells (CTCs) have been found in a number of different malignancies, including pancreatic cancer, and there are encouraging studies indicating that the detection of CTCs can predict response to treatment and survival. Measuring CTCs before and after treatment gives an indication of whether or not the patient is responding, and can help prevent patients from being exposed to a treatment that is ineffective and unnecessarily toxic. Furthermore, CTC detection may provide a means for early disease detection, which is critical for early intervention to increase the chances for curative treatment. Additionally, the CTCs offer a “liquid biopsy” because the tumor cells can be analyzed through a variety of tests including genetic mutations, which can then affect treatment choice. However, more research is needed to understand the true nature of CTCs and their significance in treatment outcomes. In the past, it has been difficult to capture these cells due to technological limitations. A novel device called the CTC-chip has recently been developed that is able to capture higher numbers of purified CTCs that were not previously possible. This allows the opportunity to perform more sophisticated molecular analyses on these cells in order to gain critical insight into the biology of these cells.

In the funded project, Dr. Ting plans to first develop a chip to capture CTCs in a pancreatic mouse model. The chip is based on immunoaffinity where the antibody is located on thousands of microposts created on a silicon surface that is about the size of a glass slide. The mouse model that is being used has many of the genetic features found in human pancreatic cancer, which makes it a very powerful tool to evaluate how the genetics of the tumor affect CTCs. The use of this model will provide a robust system to best characterize pancreatic CTCs and a foundation to guide analyses of CTCs captured from pancreatic cancer patients. With a simple blood sample, this technology provides a method to understand the biology of metastatic pancreatic cancer and evaluate how the tumor biology changes with therapies provided to patients.

The studies that will be made possible by this grant will be the first of their kind to demonstrate the potential that the CTC chip has in understanding CTCs, and is expected to have promise for the early detection of pancreatic cancer, guide current therapies, and serve as a platform for the development of novel pancreatic cancer therapeutics.