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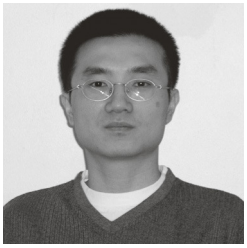
GRANT SNAPSHOT

2008 Samuel Stroum – Pancreatic Cancer Action Network – AACR Fellowship

Grantee:	Ken-Tye Yong, PhD
Institution:	State University of New York, Buffalo
Research Project:	*Engineering Multimodal Targeted Probes for Pancreatic Cancer Detection*
Award Period:	July 1, 2008 – June 30, 2009
Amount:	$45,000



Biographical Highlights

Dr. Yong received his PhD in Chemical Engineering from State University of New York (SUNY) at Buffalo. Currently, he is pursuing his postdoctoral training there at the Institute for Lasers, Photonics and Biophotonics. His advisors have been very instrumental in encouraging his involvement in pancreatic cancer research. Dr. Yong's specific interests focus on early pancreatic cancer diagnosis and therapy using nanotechnology. According to Dr. Anirban Maitra, Associate Professor, Pathology and Oncology at John Hopkins, Dr. Yong is "one of the rising stars…in developing novel imaging and drug delivery approaches." In 2006, Dr. Yong received the Visionary Innovator Award from SUNY at Buffalo for his work in nanotechnology.

Project Overview

The funded project focuses on the use of nanotechnology in noninvasive imaging to help facilitate early detection and diagnosis of pancreatic cancer. In recent years, there has been growing interest in the development of quantum dots (QDs) to help improve the sensitivity of diagnostic cancer imaging. QDs are inorganic luminescent semiconductor nanoparticles that can serve as ultrasensitive imaging probes. By varying their size, it is possible to control for their electronic and optical properties, which makes them promising probes for use in bioimaging and biosensors.

Even at the early stages of pancreatic cancer, there are certain receptors or proteins on the surface of the cancer cells that are aberrantly "over-expressed" (increased). These receptors (e.g., mesothelin, Claudin-4), which are used to activate specific body functions, including cell growth and migration, can serve as markers to interact with specific targeting molecules. In previous laboratory research, Dr. Yong found that by linking the targeting molecules to the surface of the QDs, cancerous cells could be robustly illuminated and located. By contrast, cells exposed to QDs without the targeting molecules remained dark. Though these results were encouraging, further research is warranted before the full potential of QDs as a diagnostic tool can be realized.

The funded project allows for these next steps. The goal is to create a QD-based smart nanoparticle that can be simultaneously used in optical and magnetic resonance imaging. The novel probe will be tested on highly metastatic pancreatic cell lines and on animal models with implanted tumors. The nanoparticle's pathway, side effects and interactions with tumors will be examined. Developing a single nanoparticle that can be used across multiple imaging modalities will allow results to be cross-compared. The study outcomes are expected to help pave the way for the development of novel contrast agents that can be used with patients and help improve their survival.