GRANT SNAPSHOT

2008 Constance Williams – Pancreatic Cancer Action Network – AACR Career Development Award

Grantee:	Marie-Christine Daniel, PhD
Institution:	University of Maryland, Baltimore County
Research Project:	*Multifunctional Nanovectors for Pancreatic Cancer Therapy*
Award Period:	July 1, 2008 – June 30, 2010
Amount:	$100,000

Biographical Highlights

Dr. Daniel is an Assistant Professor in the Department of Chemistry and Biochemistry at the University of Maryland, Baltimore County. She received her PhD in Chemistry at the University of Bordeau 1 in France, where she also pursued a teaching fellowship and became a research and teaching associate. Her postdoctoral training was conducted at Tokyo University in Japan and Indiana University in Bloomington. After losing her mother to a rare form of cancer, Dr. Daniel chose to devote her research to this field. Struck by the aggressiveness of pancreatic cancer and its very low survival rate, she decided to contribute to efforts to improve treatment of this highly aggressive disease.

Project Overview

This project focuses on the use of nanotechnology in pancreatic cancer therapeutics. Nanocarriers are much smaller than cells and have a size comparable to biological entities such as proteins or viruses. Among other properties, this confers upon them distinct advantages when used in treatment: they increase the blood circulation time compared to small drugs, provide protection of active agents against enzymatic or environmental degradation, and allow a combination of several different agents. Nanovectors are in general composed of three parts: a core constituent material, a therapeutic and/or imaging payload, and some biological surface modifiers that enable tumor targeting of the nanoparticle dispersion.

The objective of this project is to prepare nanoparticles that combine multiple agents and to test their effectiveness against transformed pancreatic cell lines. The nanovectors that will be prepared will combine gemcitabine, which is currently the standard chemotherapeutic for pancreatic cancer, and anti-RON antibodies that are expected to reinforce the cytotoxicity of gemcitabine. Upon the preferential entry of a nanovector into a cell, a very large quantity of the therapeutic agents will be delivered. This targeted combination therapy is predicted to allow for a dramatic enhancement in potency and efficacy in pancreatic cancer treatment along with a decrease in the side effects. In vitro (laboratory) testing of these nanovectors will be performed.