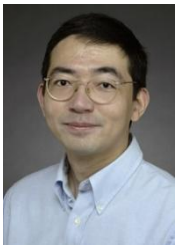
UWMRF Bradley Catalyst Grants
Round I Awards (Spring 2008, Announced June 2008)

Bradley Catalyst Phase 1 Awards ($500,000 in awarded in summer 2008)

In June of 2008, the UWM Research Foundation announced the first seven catalyst grant awards made with the support of The Lynde and Harry Bradley Foundation. Seven projects were funded for a total of $500,000 in support.

Advanced Nanomaterials for Biomedical Applications



Jain Chen, Ph.D., Assistant Professor, Chemistry Department

Project Overview. The goal of this project, "High-Dielectric-Constant Nanotube-Polymer Composites," is to synthesize the next generation of nanomaterials with dielectric constants ten times greater than existing materials by leveraging the unique properties of carbon nanotubes (CNTs), a fundamental breakthrough needed to enable the next generation of biomedical devices. This project will focus on the development of a new class of composites using multi-walled carbon nanotubes, in which the outer layer is made nonconducting via controlled covalent nanotube surface chemistry and the inner graphene layers are unfunctionalized and remain electrically conducting.

Development of a Novel System for Production of Proteins

Mary Lynne Collins, Ph.D., Professor, Department of Biological Sciences

Project Overview. This research project, "Production of recombinant membrane proteins in *Rhodospirillum rubrum*" focuses on further development of a system to produce membrane proteins in a bacterium known as *Rhodospirillum rubrum*. A reliable system to produce membrane proteins will be a valuable tool to pharmaceutical companies in the development of therapeutics and vaccines. Support for this project is helping Dr. Collins and her team to demonstrate that the system can produce particular high-value proteins in sufficient quantities for widespread use.

Synthesis of Novel Compounds to Treat Alcohol Addiction

James M. Cook, Ph.D., Distinguished Professor, Department of Chemistry

Project Overview. This project, "Synthesis of Aza B-carbolines to Treat Alcohol Addiction," builds on two compounds synthesized in Dr. Cook's laboratory that were shown to reduce alcohol self-administration in alcoholic rat lines via a novel new mechanism. This testing has recently been extended to primates, a promising indication that related compounds may form the basis for human therapeutics. However, numerous challenges remain, including developing compounds that have greater water solubility, a key property that will increase the bioavailability of the drug (the ability of the body to use the drug). The goal of this project is to develop water soluble analogs of the most promising compounds that can form the basis for a new drug to treat alcohol addiction.

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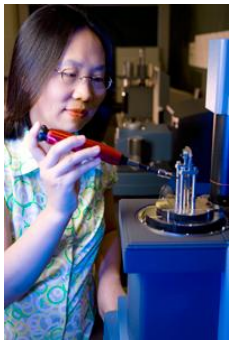
Development of Cancer Drug Delivery Molecule

Shaoqin (Sarah) Gong, Ph.D., Associate Professor, Department of Mechanical Engineering



Project Overview. The objective of this project, "Multifunctional Unimolecular Micelles for Targeted Cancer Therapy," is to develop a new molecular structure for delivery of anticancer drugs and magnetic resonance imaging (MRI) contrast agents that can greatly improve the efficacy of cancer therapy. The novel structure conceived by Dr. Gong can target tumors through two mechanisms: passive targeting due to the nano-size of the delivery molecule (based on the fact that blood vessels in tumor tissue are "leaky," thereby allowing the drug nanocarrier to extravagate specifically to the tumor tissue) and active targeting through targeting ligands attached to the surface of the drug nanocarrier (a targeting ligand can recognize and bind to receptors that are unique to cancer cells).

Development of a Microelectronic DNA Biosensing Device

David Klemer, M.D., Ph.D., Associate Professor, Department of Electrical Engineering

Project Overview. This project, "A Novel High-Electron-Mobility Transistor (HEMT) for DNA Detection", brings together biology and semiconductor technology to create a novel low-cost device for in vitro diagnostics that is both sensitive (able to detect very low levels) and specific (able to distinguish subtle variations). The proposed device will incorporate DNA strands to a semiconductor structure and allow electronic circuits to "read" the presence of particular DNA sequences.

Novel Treatment for Fungal Infections

Graham Moran, Ph.D., Associate Professor, Department of Chemistry and Biochemistry

Project Overview. The project, "Use of 2-(2-nitro-4-trifluoromethylbenzoyl)-1, 3-cyclohexanedione (NTBC) in Treatment of Fungal Infections," seeks to demonstrate that a new class of molecules can be used to treat fungal infections. The advantage of NTBC is that it is already in use as a drug to treat unrelated metabolic disorders and is known to be safe.

Development of Advanced Retinal Imaging System

Hao Zhang, Ph.D., Assistant Professor, Department of Electrical Engineering

Project Overview. This project, "Developing a Functional Photoacoustic Ophthalmoscope," combines several cutting edge techniques, and may ultimately offer clinicians an affordable system for the diagnosis of retinal disease. This project, done in collaboration with researchers at the Bascom Palmer Eye Institute and the Medical College of Wisconsin, will move toward applying this technology to the eyes – where the capabilities of photoacoustic imaging can offer unique diagnostic information.