

Research Initiation Program Awards Announced

Ten faculty members at Winston-Salem State University have received seed funding awards from the University's Research Initiation Program (RIP). The program, established in 2005 and now in its second year, provides up to \$10,000 to tenured and tenure-track faculty to generate feasibility studies or other preliminary data and to provide resources for scholarly work in disciplines with limited external support.

The award recipients represent the diversity of research taking place at WSSU – research activities reflective of the four academic centers of excellence at WSSU: teaching and learning, science and technology, health services, and financial services. These initiatives corroborate WSSU's strong commitment to serving society through innovative research, partnerships, and alliances.

Award recipients for the 2007-2008 academic year are:

Dr. Johanna Porter-Kelley
Department of Life Sciences
College of Arts and Sciences
Award: \$10,000

Proposal Title: "The Role of Adaptor Protein Complex 3 in the Morphological Transformation of Leishmania"

Abstract: Leishmaniasis is a human and animal disease caused by the protozoan parasite *Leishmania*. It is a major affliction in the Tropical and Subtropical World, including areas where US soldiers currently occupy. A long standing question in *Leishmania* biology is: what are the molecular mechanisms by which *Leishmania* undergoes cellular remodeling? Protein and lipid synthesis has been well characterized in eukaryotes however; little know about protein and lipid degradation. This research will focus on unraveling the trafficking pathway by which these proteins and lipids are transported to the lysosomes for degradation. The study will determine if the AP3 complex is expressed in *Leishmania* and localize the components of the AP3 complex to the endosome/lysosomes.

Dr. Jafar Gharavi-Naeini
Department of Chemistry
College of Arts and Sciences
Award: \$10,000

Proposal Title: "Raman Lasers in Phospho-silicate and Phosphate-glass Optical Fibers"

Abstract: Raman scattering by the vibrational excitations in materials has been recognized as an invaluable technique for designing wavelength converter-based photonic devices. One important application of this technique is in optical communications that use germanio-silicate optical fibers with considerable length and utilize Raman lasers as convenient light sources for signal amplifications. The proposed research involves the development of Raman lasers using both phosphosilicate and phosphate-glass optical fibers as the gain media. Due to the larger Raman shift in these materials, these lasers

might provide novel infrared light sources for various medical and acousto-spectroscopy applications.

Dr. John T. Yi
Department of Chemistry
College of Arts and Sciences
Award: \$10,000

Proposal Title: Orientation and Conformational Studies of Chiral Biomolecules: N-acetyl-tryptophan amide and N-acetyl-tryptophan methyl amide in the collision free environment

Abstract: Nature's unique degree of chiral purity and inter/intra-molecular interactions has profound implications in the world of biophysics. The realization of the ineffectiveness or deleterious side effects of the wrong molecular orientation and the consequent need for chiral selective synthesis have helped fuel billions of dollars per year of research by the drug industry. One technique for the structural characterization of chiral molecules is high resolution ultraviolet laser spectroscopy which exploits the subtle optical implications of molecular chirality. This research will focus on ultraviolet spectroscopic studies designed to characterize the molecular orientation of two prototype peptides by electronic transition, assembled in gas phase environment.

Dr. Indranil Ghosh
Department of Economics and Finance
School of Business and Economics
Award: \$3,500

Proposal entitled: Collusion Detection in B2B Online Reverse Auctions: A framework for analysis and some results

Abstract: Auctions have played a crucial role in determining the price of variety of goods and services for thousands of years. When businesses and governments procure goods and services, they use reverse auctions. An online reverse auction is a real-time dynamic auction between a buyer organization and a group of pre-qualified suppliers who compete against each other to win the business to supply goods or services. Online Reverse Auctions are susceptible to collusion among suppliers with the consequence of unfavorable outcomes for the buyer firms. This research will provide a framework for detecting collusions, and look at the relationship between auction values and the propensity of collusion.

Ms. Stephanie Pickett
Department of Nursing
School of Health Sciences
Award: \$10,000

Proposal entitled: Using a Community Based Health Care Center to Improve the Management of Cardiovascular Disease Risk Factors of the Medically Underserved

Abstract: The eastern section of Forsyth County, North Carolina represents a population of predominately low income African Americans who have or who are predisposed to cardiovascular disease and yet lack medical care. Residents of this community have access to an inadequate number of primary care health care providers; have little or no

medical insurance, lack transportation, and experience cultural and language barriers that prevent many from receiving needed healthcare. The Community Family Practice and Wellness Center (CFPWC) were designed to meet the needs of this population by improving access to medical care. This research will evaluate the effectiveness of the center in assisting clients in the management of cardiovascular disease.

Dr. Zagros Madjd-Sadjadi
Department of Economics
School of Business and Economics
Award: \$10,000

Proposal entitled: North Carolina Mexican Immigrant Survey

Abstract: A detailed survey will be conducted to provide accurate estimates of legal status of the Mexican immigrant population in North Carolina. In addition, detailed information about remittances to Mexico, health insurance coverage, access to health care and health status, and the occupations and incomes of Mexican immigrants will be gathered. The study will provide evidence on the utilization of NC driver licenses and government services from a household survey in census blocks that contain large numbers of Mexican immigrants. Local Community-based organizations will provide Spanish-speaking Mexican immigrants to administer the survey in this study.

Dr. Anne Jenkins
Department of Occupational Therapy
School of Health Sciences
Award: \$10,000

Proposal entitled: Demystifying Spirituality: A Healing Odyssey

Abstract: Spirituality has been given increasing attention within the medical profession. Evidence documenting the relationship between spirituality, well-being, and health outcomes indicates the need for healthcare providers to consider the impact of the client's spirituality. This pilot study will focus on student attitudes toward spirituality and perceptions of the role of spirituality in the care of clients. The study will pioneer initiatives for developing course curricula concepts on spirituality in relationship to intervention strategies and awareness of the role of spirituality in clinical practice.

Dr. Christo Dichev
Department of Computer Science
College of Arts and Sciences
Award: \$9,996

Proposal entitled: Topic Maps- Based Information Management

Abstract: The information explosion experienced at present creates opportunities and obstacles. The massive amount of available information is too large for users to maintain and keep current without the help of efficient information management systems. This research will investigate the application of the Topic Maps model in organizing, managing and accessing large and continuously growing information pools by providing semantic annotation for the information. The goal is provide the ability to bind all information relevant to given subjects to a single point. The project will provide a basic

architecture that enables mobile users to retrieve and edit information contained within Topic Maps and associated information objects.

Dr. Jinsuk Baek
Department of Computer Science
College of Arts and Sciences
Award: \$10,000

Proposal entitled: Performance Evaluation of Novel Hybrid Cache Architecture for Cooperative Web Caching

Abstract: The explosive growth of the World Wide Web in size gives rise to the problem of prohibitive network congestion and unacceptable service response times. An effective solution to this problem is web caching that employs an additional server between the clients and the main server for caching the popular web objects near the clients. Deploying groups of cooperating caches provides scalability and robustness by eliminating the limitations caused by a single proxy cache. This project is focused on the design and implementation of an efficient hybrid caching architecture using both hierarchical and same level caches. Simulation experiments will be performed to evaluate the performance of newly developed architecture in terms of cache hit rate, the number of query messages from clients, and response time.

Dr. Darina Dicheva
Department of Computer Science
College of Arts and Sciences
Award: \$10,000

Proposal entitled: Semantic Annotation of Digital Cultural Heritage Collections

Abstract: There is an increasing concern for preserving cultural heritage worldwide and numerous projects have been initiated to create digital artwork collections and make them available on the Web. Most digitizing online cultural heritage projects do not focus on innovative use of technologies to make these collections more effective. The goal of this research is to investigate the appropriateness of applying Semantic Web technologies, and in particular Topic Maps, for semantic structuring and annotation of digital artworks collections, in order to improve the efficiency of their searching and browsing. The project will design and implement base software for semantic annotation of digital artifacts to support the creation and effective use of different kind of digital collections with a special focus on virtual collections of artworks.

The Research Initiation Program Committee, chaired by Dr. Jill Harp, Associate Professor of Chemistry, received 14 proposals adding up to over \$133,000 in funding requests. Dr. Amos Olagunju, the Chief Research Officer and Dean of Graduate Studies and Research, applauds WSSU for allocating a portion of Indirect Costs to strengthen the research capabilities of faculty members.