Research Initiation Program (RIP)
Award Recipients
2013-2014

The Research Initiation Program received an outstanding response to the call for proposals. The quality and quantity of proposals for this year's competition were generally great! The RIP Committee would like to have had sufficient funds available to award everyone, but due to the lagging economy only the following proposals have been selected for FY 2012-2013 funding

Dr. Jinsuk Baek
Computer Science
College of Arts and Science
Amount Awarded: $10,000.00

Project Title: "*A Lightweight Transport Protocol to Support Reliable N-Screen Services*"

Abstract: Recently, we are surrounded by multiple heterogeneous computing devices such as desktop computers, laptops, smart phones, smart televisions, and tablet PCs. Each device is operated with its own host operating system, has its own internal architecture, and performs its independent tasks with its own applications and data. A common property amongst these devices, namely that of Internet-connectivity, allows them to configure N-screen network by interconnecting each other through an intermediate switching device. The N-screen service can be described as a seamlessly unified computing environment across multiple devices with synchronized data and application programs. As such, it allows us to freely switch our workspace from one device to another while continuing the interaction with the available applications. The attendant requirement for such a capability is providing seamless file synchronization among the multiple devices. However, we note that the current N-screen services do not provide efficient data flow among devices. Even when it is possible, a certain level of user intervention with explicit direction is required. Therefore, many users still tend to manually copy data from one device and paste it to another device using a portable or virtual storage device. In this research, we propose and develop a new reliable transport protocol to support file synchronization for the N-screen network. In order to cope with battery limitation of many mobile devices in N-screen network, the proposed protocol is designed to provide energy efficient communications. The proposed protocol is operated in a virtual environment allowing it to work effectively across different platforms.

Dr. Rebecca Caldwell
Computer Science
College of Arts and Science
Amount Awarded: $9,997.70

Project Title: "*Developing Robotics Laboratory Modules to Increase Student Engagement in Introductory Computer Programming Classes*"

Abstract: The United States Department of Labor predicts that between 2008 and 2018, 1.4 million computing jobs will have opened in the United States. It is imperative that colleges produce more students studying Computer Science if we are to fill those jobs. The computer science

discipline teaches students design, logical reasoning, and problem solving. Most freshmen entering the computer science major have no previous programming experience. Computer programming is seen by a vast majority of students as more difficult and time consuming, and less interesting than other courses of study. Learning to program is a time consuming task, as a very large number of hours must be spent at computer writing and debugging code. Unfortunately, this gives students a sense of information overload as well as a seemingly unstructured set of concepts to link together. Introductory programming classes typically lose more than 50% of the students that enroll. Robotics is being used as a tool to improve student satisfaction and engagement in Computer Science. Why use robotics? Robotics systems are powerful and affordable. Course modules will be designed using a robotic context to engage students in Computer Programming I. The overall goal of this research project is to improve student comprehension of course content by providing students with a hands-on activity designed to improve student satisfaction and engagement in an introductory programming course.

Dr. Charlotte Frazier
Behavioral Sciences and Social Work
College of Arts and Science
Amount Awarded: $9,000.00

Project Title: "*Psychological Health Assessment Among Ethnic Minority Older Adults*"

Abstract: Recent years have brought an increased focus on aging issues and the older adult population among researchers in the social and behavioral sciences, who seem to become progressively more interested in the construct of psychological health. While there are several well-documented tests and surveys to measure psychological health in general populations, many scholars have pointed to the apparent lack of psychometrically sound assessment instruments that are available for effective use in studying older adults. This assertion is even more alarming when one considers the dearth of instruments that have been validated for use with ethnic minority older adults, or other specific subsets of the older adult population. The objective of this study, therefore, is to examine the psychometric properties of a psychological health assessment instrument [Scales of Psychological Well-Being (SPWB); Ryff, 1989] for use with African-American older adults, and will be the first study to attempt such an objective. Results of this investigation will determine the factorial structure of the SPWB among African-American older adults, and reliability and validity indices will be compared to those of the SPWB among other groups in previous literature. This study is intended to help improve scholarly work on African-American elders, and to suggest future research directions for those in need of sound tools to assess psychological health in multicultural populations.

Dr. Fenghai Guo
Chemistry
College of Arts and Science
Amount Awarded: $6,000.00

Project Title: "*Development of Carbon Bond Forming Strategies in Synthesis of Bioactive Heterocycles"*

Abstract: Synthetic Methodology Development, Total Synthesis, Catalysis, Organic Chemistry Heterocycles continue to be the focus of intense synthetic activity both in academia and industry. Over 75% of the top 200 brand name drugs are heterocycles. Heterocycles also account for more than 50% of all known organic compounds. In nature, heterocycles are active components for defense, communication, and reproduction. Their rich activity in biological systems is important for pharmaceuticals, agricultural products, and natural products. As a result, there has been increasing interest in synthesis of novel heterocycles. Synthesis of complex heterocycles has had tremendous impact on the development of chemistry, biology and medicine. However, it is a misconception that heterocycle synthesis is a mature field. Lengthy synthetic sequences, low efficiency in most multi-step syntheses make it extremely challenging to provide sufficient quantities for therapeutic purposes. The inefficiency is often due to the limited availability of novel synthetic methodologies that will enable the construction of carbon carbon bonds efficiently. Carbon carbon bond formation is very valuable in forming the carbon skeletons of complex heterocycle. This project will develop efficient metal catalyzed carbon carbon bond formation reactions for heterocycle synthesis. Merging two carbon-carbon bond formations in an environmentally benign one-pot process will also be investigated. The proposed method will be used to synthesize a number of complex bioactive heterocycles from flavonoid family, known for their rich biological/pharmacological activities such as anticancer, antibacterial, antiviral and anti-inflammatory.

Dr. Dawn Henderson
Behavioral Science and Social Work
College of Arts and Science
Amount Awarded: $9,777.50

Project Title: "*I Just Can't Give Up Now: A Mixed Methods Examination of Resilience and College Persistence among African American Men"*

Abstract: There exists a need to identify and develop alternatives to current out-of-school suspension (OSS) practices. To date, minority males are disproportionately represented in out-of-school suspension rates, and, without intervention, set upon a pathway from school to prison. Winston-Salem/Forsyth County Schools have implemented alternative learning centers (ALC) to mitigate out-of-school suspension and promote academic achievement and graduation. This proposal aims to employ a case study mixed methods design to: a) examine the effects of alternative learning centers (ALC) on academic and social/behavior outcomes among at-risk youth; and b) examine unique program and implementation characteristics of alternative learning centers across two school sites. To assess program effects, quantitative data will be collected from ALC (n = 105) and non-ALC (n = 105) youth participants on academic and social/behavior outcomes. Qualitative data will be collected from ALC youth participants, staff and school administrators to evaluate their perspectives of ALCs and its impact in the lives of youth. In addition, site observations will be

conducted to assess program characteristics and behavior. This proposal seeks to generate and disseminate findings that support evidence-based practices around alternative learning centers and advocacy efforts in reducing suspension rates among minority male youth. More importantly, findings from this project will support additional funding efforts to expand research in alternative to suspension models and positive youth development.

Dr. Bakarr Kanu
Chemistry
College of Arts and Science
Amount Awarded: $9,999.75

Project Title: "*Nano Electrospray Ionization Ambient Pressures Ion Mobility Mass Spectrometry for the Detection of Liquid Explosives, Illicit Drugs, and Chemical Warfare Agent Simulants"*

Abstract: Instrument and Software Development, Bioanalytical, Forensic Chemistry, Chemometrics, Polymers, Environmental Chemistry A common problem encountered in the field when explosives or drugs are detected is the presence of false positives. A false positive is a result that indicates an explosive or drug was present in the detection, when in fact it was absent. As it relates to the PI's research, commonly encountered false positives are cosmetic products like body lotions, colognes etc. The PI previous research activity involved developing a 1D-GC-IMS. This platform was used to investigate false positive responses commonly encountered in the field when explosives or drugs are detected. The data showed that it was possible to discriminate false positive responses from the response of explosives or drugs.
The platform used in the previous work was unable to separate all false positives that were encountered. It was clear that the dimension of the instrument needs to be increased in order to achieve separation of problematic false positives from explosives or drugs studied. Funds from the start-up money of the PI have already been used to purchase an IMS instrument. However, to successfully continue with this project and put the instrument to use, several research supplies needs to be purchased. This grant will be used to generate more data on this project. Any initial data will be very useful for submitting a full proposal to the National Science Foundation (NSF), Defense Threat Reduction Agency (DTRA), or Department of Homeland Security and move this research to the next phase.

Dr. Sezgin Kiren
Chemistry
College of Arts and Science
Amount Awarded: $6,000.00

Project Title: "*The Study of Intramolecular reactions of N-acyldihydropytidones for the construction of piperidine containing ring systems"*

Abstract: In the science of synthesis, there is still a constantly increasing demand to find novel and more efficient synthetic methods, since they play a crucial role for the assembly of significant entities, such as natural products, pharmaceuticals, agrochemicals, and petrochemicals. Accordingly, the specific focus of this research proposal centers on the intramolecular reactions of N-acyldihydropyridones for the construction of piperidine containing ring systems, which are abundantly seen in the structure of the aforementioned chemicals. The intramolecular cyclization

will be realized under various conditions such as nucleophilic, radicalic, organometallic additions and cycloadditions. This novel strategy will rapidly provide the rigid bicyclic and tricyclic ring systems, which will be further elaborated to access structurally challenging chemical entities for further studies.

Dr. Jack Monell
Social Sciences
College of Arts and Science
Amount Awarded: $9,409.00

Project Title: "*A Qualitative Analysis of African American Students, Delinquent Contact and Continued Academic Success*"

Abstract: The Principal Investigator will conduct a qualitative analysis of African American students at Winston-Salem State University to gauge how education and additional supportive measures deterred future delinquent behaviors. A total of 10 students (both male and female) will be interviewed expanding on the researcher's prior quantitative research on early precursors of delinquent behavior. This study will examine how students, whom had prior delinquent (ages 10-17) contact (arrest, intake, deterrence, and placement), were able to abstain from criminal behaviors and continue with academic pursuits and interests.

The researcher will inquire on the nature of their willingness to refrain from delinquency and further attempt to comprehend what supportive elements were in place to provide such support. As the research suggests that students with minimal supportive components in place tend to re-offend, the rationale with the proposed sample is that they received some supports to continue their studies, specifically leading them to Winston-Salem State University.