RISE Education

Goals:

The goals of the education program in the funded RISE project all are designed to primarily strengthen the graduate program in Environmental Toxicology at TSU. More specifically, the main educational goals are:

1. establish a competitive graduate research fellowship,
2. improve existing curriculum to create a strong multidisciplinary foundation,
3. embrace the K-12 community and undergraduate students through summer internship programs to advance research-based learning experiences within that population and motivate them to pursue advanced degrees in STEM fields,
4. promote a professional academic environment by organizing several grant writing workshop, seminar series and journal club, and conference and meetings participation.

Outreach programs:

The goals and objectives of our project's outreach program will address issues associated with the underrepresentation of minorities in STEM careers by providing summer internship programs for high school and undergraduate students. We aspire to capture the interest and imagination of young, underrepresented students in STEM disciplines. Recently, the US House of Representatives recognized the College of Science and Technology STEM awareness forum for commitment and dedication to STEM education at TSU. At present, only 6% of all 24-year-old Americans hold an undergraduate degree in STEM disciplines. However, for African-Americans, Hispanics, and Native Americans, the current STEM degree holding percentage is 2-3%, less than half than that of all Americans. In addition to ur educational efforts (read more below), our outreach efforts will include:

1. Publication of research findings in peer reviewed journals Targeted including: Environmental Science & Technology, Environmental Health Perspectives, Applied and Environmental Microbiology, etc.

2. Student and faculty presentations at regional and/or national conference. Presentations will be made in scientific conferences such as: the Society of Environmental Toxicology and Chemistry Annual Meeting, American Society for Microbiology General Meeting, American Association for Cancer Research, Texas Academy of Science, etc.

3. Dissemination of research findings of this project, including (but not limited to) publications, technical reports, and community outreach material on this webiste.

College Student Research Training:

Our funded RISE project will directly support both undergraduate (during the summer months) and graduate (PhD) students (throughout the academic year) at TSU.

Undergraduates:

1. Recruit 4 undergraduate students to work with the investigators for 10 week during summer months.
2. Each undergraduate student will conduct hands-on training in principles, instrumentation, and techniques and participate in laboratory meetings to formally/informally discuss research and current literature related to research topics.
3. Provide each undergraduate student with career planning and guidance on how to apply to STEM graduate programs. Each student will be required to prepare a written report at the end of the summer program detailing the research in which they have participated, and how the experience has affected their plans for the future.

PhD Environmental Toxciology Graduate Students:

The Department of Environmental and Interdisciplinary Sciences, administered by Interim Chair Dr. Jason A. Rosenzweig, houses both the Ph.D. and M.S. degree programs in Environmental Toxicology. This Ph.D. degree program, will be greatly strengthened by the RISE project in that 4 minority doctoral students will receive the Graduate Research Fellowship that consists of a generous stipend and tuition reimbursement. The selection process will take into account a personal interview, the grade point average and test scores. The winners of the fellowship will have the opportunity to work with one of the 4 RISE investigators on broad, multidisciplinary, cutting-edge projects. Through the monthly seminar program, students will interact with local leaders in the area of environmental toxicology and discuss job opportunities upon graduation. Two graduate level courses in *Modeling and Computer Simulations of Complex Systems*, and *Scientific Discovery enabled by Big Data* will be offered as Environmental Toxicology Special Topics courses. The objective of these courses is to introduce and facilitate the use of supercomputing methods as effective tools in environmental toxicology research. Hands-on training on parallel computing will be offered through the High Performance Computing Center at TSU.

High School student training:

TSU has an established relationship with Jack Yates High School, a Houston Independent School District public high school partner.

To directly address this disparity, we will:

4. Recruit 4 rising senior high school students to work with the investigators for 10 week during the summer months.
5. Each student will conduct hands-on training in principles, instrumentation, and techniques and participate in laboratory meetings to formally/informally discuss research and current literature related to research topics.
6. Provide each high school student with career planning and guidance on how to apply to college and chose STEM fields. Each student will be required to prepare a written report at the end of the summer program detailing the research in which they have participated, and how the experience has affected their plans for the future.

With regards to our HS initiative, our RISE project will focus on positively influencing measurable academic outcomes at one local high school. The Jack Yates High School (HS) is physically adjacent to our TSU campus, and our program's success there will be evaluated by a survey instrument that will gauge HS students' attitudes towards STEM employment.