Award ID:
RP140113

Project Title:
Continuation of Computational Cancer Biomedicine Training Program

Award Mechanism:
Research Training Award Continuation Grants for Years 4 and 5

Principal Investigator:
Briggs, James

Entity:
University of Houston

Lay Summary:

The complex interplay among the often disparate clinical and research computational science applications that impact cancer medicine and biology, demands innovative and interdisciplinary methods of cancer research. Cancer biologists and clinicians must collaborate with leading researchers in mathematics, computational science and engineering to more effectively study cancer and develop cutting edge tools that will lead to breakthroughs and creative solutions. The goal of this proposed postdoctoral training program is to increase the number of skilled, multidisciplinary cancer researchers in Texas who are uniquely able to integrate the tools, ideas, and materials of computational science and biology. This inter-institutional program will utilize the considerable resources and distinguished faculty of the six institutions of the Gulf Coast Consortia/Keck Center: University of Houston, Rice University, Baylor College of Medicine, The University of Texas MD Anderson Cancer Center, The University of Texas Health Science Center-Houston, and The University of Texas Medical Branch at Galveston (UTMB). These institutions have a long-standing history of working together in undergraduate, graduate, and postdoctoral training programs, and each brings a unique research and/or clinical strength necessary for the success of this Computational Cancer Biology Training Program (CCBTP). The medical institutions bring essential insight and expertise in the prevention, detection, and treatment of cancer. The research universities bring cutting-edge techniques and expertise from mathematics, computer science and engineering. The University of Houston will continue to serve as the lead institution with Dr. Rathindra Bose serving as PI, and Dr. B. Montgomery Pettitt, Robert. A. Welch Chair of Chemistry at UTMB serving as co-PI and Project Director. Dr. Pettitt and the inter-institutional steering committee will continue to review applicants and select trainees, approve faculty co-mentors, conduct trainee progress reviews, develop educational seminars and workshops (didactic and hands-on), and provide career guidance and preparation. Multidisciplinary training faculty, including advanced applied mathematicians, bioengineers, computer scientists, cancer biologists and cancer clinicians, from all six GCC institutions will participate. We will draw postdocs from the computational disciplines to train in cancer biology and from the biological sciences to train in computational approaches. Each trainee will have a primary mentor with a secondary mentor in a complementary area, and will work on challenging problems requiring expertise from both mentors. For example, if the primary mentor is a cancer biologist or clinician, the secondary mentor might be a computer scientist. To ensure a strong integration of disciplines, each trainee will be required to do a 2-4 month sabbatical in the secondary mentor's laboratory. By developing proficiency in a second

technical area, trainees will acquire first-hand experience in unique scientific areas with distinct languages and cultures related to the toughest problems in cancer research. Thus, our CCBTP trainees will also develop the skills to manage research at new interfaces. To complement the research experience, CCBTP trainees will attend 1) a weekly seminar course with local and national speakers, followed by casual networking among postdoctoral trainees, faculty and scientists; 2) symposia and workshops addressing issues in computational cancer biology, mentoring, and presentation skills; 3) a one-day annual research conference focusing on selected areas of cancer diagnosis, treatment and cutting edge cancer research, sponsored by the CCBTP; and 4) one national meeting per year to present their research and network with leading cancer scientists. Trainees will also mentor undergraduates during a special summer program. The mission of the Computational Cancer Biomedicine Training Program is to bring together biological and computational researchers and clinicians of the Texas Medical Center to share knowledge, ideas and techniques, more effectively use existing tools, develop new, innovative tools, and create a new generation of interdisciplinary cancer researchers. As a whole, this program will prepare postdoctoral trainees for independent, interdisciplinary scientific careers in the cancer research workforce of Texas and greatly impact our ability to understand and combat the complexities of cancer.