

## POSTDOCTORAL RESEARCH, INSTRUCTION, AND MENTORING EXPERIENCE (PRIME) PROGRAM

*supported by the NATIONAL INSTITUTE ON GENERAL MEDICAL SCIENCES*

*Institutional Research and Academic Career Development Award (IRACDA)*

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### **Education as a Means to Foster Health Equity**

The Sullivan Report (2004) reveals that a major impediment to health equity in the U.S. is the paucity of under-represented minorities (URM) in the medical and allied health professions. The partnership of Wake Forest University School of Medicine (WFSM) and Winston-Salem State University (WSSU) will contribute to overcoming this disparity by training translational scientists as medical educators for the health professions in North Carolina, a region populated by rural African American families (17% of North Carolinians) and the fastest growing Hispanic American population in the country (>600% increase in the last decade). By recruiting from a diverse population of applicants, we will increase the numbers of URM academic researchers, and train them to utilize innovative methods that enhance the learning environment and support the career development of URM pre-professional and allied health professions students.

### **The PRIME Program to Develop Educator-Scholars in the Medical and Allied Health Professions**

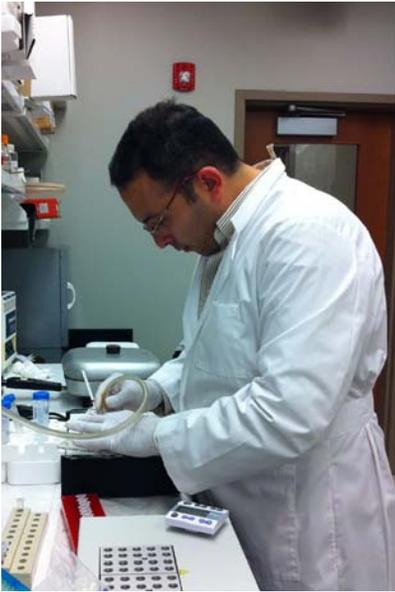
The goal of the Postdoctoral Research, Instruction, and Mentoring Experience (PRIME) program, supported by the National Institute on General Medical Sciences, is to develop highly skilled biomedical scientists to teach the next generation of clinical researchers and allied health professionals. PRIME also strives to promote research competencies of under-represented minority undergraduate and graduate scholars in the health professions. WFSM and WSSU, an HBCU with longstanding commitment to biomedical and allied health training programs, will train PRIME scholars by integrating traditional mentored postdoctoral research at WFSM, regular in-depth professional development programming at WFSM, WFU and WSSU, and a broad variety of teaching assignments in pre-professional and allied health professional (with a focus on Physical Therapy) courses at WSSU. PRIME will aid in recruitment, retention, and development of more under-represented minority clinical scientists by immersing PRIME scholars, their WFU mentors, and undergraduates in the MARC U\*STAR and MBRS RISE programs at WSSU in a rich collaborative learning environment. Additionally, PRIME will strengthen existing collaborations in research and teaching between WFSM and WSSU. To meet these goals, the PRIME Program aims are to:

1. Train scholars in research with a faculty member in a WFU Graduate School of Arts and Science's program in Integrative Physiology and Pharmacology, Neuroscience, or Molecular Medicine and Translational Sciences.
2. Train scholars in mentored teaching experiences at WSSU for the entire three year training, including tutoring, lecturing, laboratory design and development, guiding students through robotics simulations, leading case-based learning (PBL), and open-source digital teaching tools.
3. Introduce PRIME scholars to current pedagogical techniques and educational philosophy through a semester-long course, and short workshops from the WFU Teaching and Learning Center and others.
4. Facilitate mentoring skills by pairing PRIME scholars with WFSM faculty to oversee the research training of WSSU MARC U\*STAR and MBRS-RISE undergraduates, and PREP post-bac students.
5. Train PRIME scholars in translational research practices and grant writing.
6. Train PRIME scholars to become leaders in Responsible Conduct of Research (RCR) education programs.

### **Research and Instructional Opportunities**

**WFSM Research Training Faculty:** the WFU Graduate School of Arts and Sciences is the home of the Office of Postdoctoral Affairs, which manages the professional development activities of more than 175 postdoctoral researchers in strong, interdisciplinary training programs. PRIME scholars can select from 45 research training faculty from the programs in Integrative Physiology and Pharmacology, Neuroscience, and Molecular Medicine and Translational Sciences. These programs are applicability to the scientific fields likely to be sought by future faculty in the medical and allied health professions, and there is considerable overlap between programs and many shared resources. All of the participating training faculty from these programs are at the associate or full professor level, and are well-funded and exceptionally productive researchers. The PRIME program adds to the current postdoctoral positions supported by the NIAAA training in biology of addiction, the NIDA neuroscience of

drug abuse training, and the NINDS training in multisensory processes grants. The PRIME faculty members contribute greater than half of the training faculty designated for undergraduate research training programs including the NHLBI-supported summer training program “Excellence in Cardiovascular Sciences”, the NIGMS-supported PREP program, the WSSU MARC U\*STAR and MBRS RISE programs. This faculty participation is important to provide PRIME scholars with the opportunity to co-mentor an URM student in their research project.



**WSSU Biomedical Research Infrastructure Center (BRIC), MARC U\*STAR and MBRS RISE:** WSSU’s institutional commitment to fostering a biomedical research and training environment dates from at least 1971, when Project Strengthen was established. The Biomedical Research Infrastructure Center (BRIC) at WSSU was established in 1996 through funding from the National Center for Minority Health and Health Disparities, and since 2002 has collaborated with Project Strengthen to educate and train quality science graduates. BRIC provides a strong research training environment that enhances the development of researchers and health professionals who may devote their careers to biomedical and behavioral sciences in minority communities. BRIC researchers focus on health and disease in the fields of neuroscience, cancer biology, cardiovascular and drug addiction research. Seeking to “prepare students to demonstrate competence in critical thinking, solving problems and conducting research,” BRIC facilitates collaborations

among scientists from WSSU’s Departments of Life Sciences, Chemistry, and Behavioral Sciences and School of Health Sciences as well as WFU Graduate School programs in Integrative Physiology & Pharmacology, Molecular Medicine and Translational Sciences and Neuroscience, and the Hypertension & Vascular Research Center. WSSU and BRIC enjoy a successful tradition of encouraging faculty to develop research programs, while providing a training ground for URM students. Notably, WSSU has obtained federally funded programs to provide biomedical research opportunities for students who intend to pursue a research-based doctorate through the MARC U\*STAR program and MBRS/RISE, as well as HBCU-UP and BASS programs. PRIME scholars will promote undergraduate research programs by contributing to the undergraduate science classes, as well as by providing encouraging, mentoring relationships in the research environments.

**WSSU Physical Therapy Program:** the Doctoral of Physical Therapy (DPT) degree is the first doctoral level degree at WSSU. In the last 6 years, the DPT program has experienced a 50% increase in the enrollment of the program with the ethnic minority composition averaging 35% of each cohort (6 to 7 times the national average). The tenure-track faculty has doubled from 5 to 12 FTE’s. The program has procured grant funds in excess of \$750,000 along with corporate gifts and state funds totaling \$250,000 to create a virtual hospital that houses 13



human patient simulators. The WSSU faculty has provided training on the use of these simulators to postdoctoral trainees who teach Applied Physiology and Pharmacology classes in the DPT program. The Department of Physical Therapy established the first inter-institutional research lab to be shared between WSSU and WFSM. This Human Movement and Biodynamics laboratory supports the education of WSSU DPT, WFSM medical students and residents, WFU postdocs, and faculty from both institutions. This laboratory provides high level technology used in the assessment of human movement, posture, balance, muscle activity, tissue

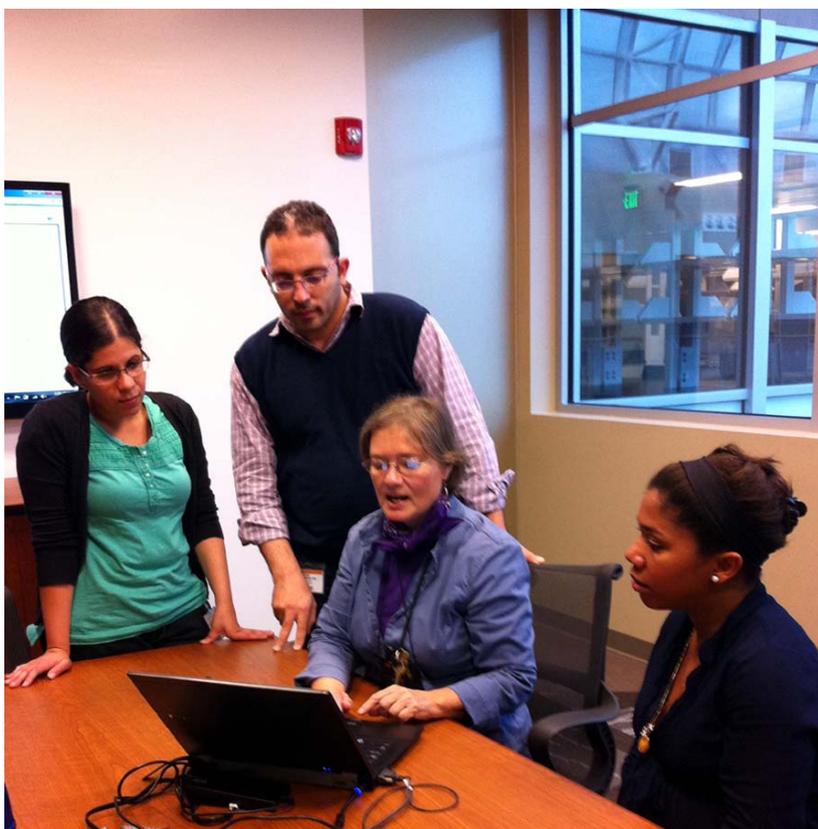
pressure mapping and oxygen uptake. More than 20 presentations, 6 publications and 14 grant applications have resulted from this scientific relationship. DPT students benefit from the interaction with researchers investigating cardiovascular, pulmonary, nervous system, muscle, and other fields, while WFSM postdoctoral trainees gain teaching experience.

## Current Pre- and Postdoctoral Research/Teaching Trainees associated with the Postdoctoral Research, Instruction and Mentoring Experiences (PRIME) program

The **Postdoctoral Research, Instruction and Mentoring Experiences (PRIME)** program is supported as a new grant funded by the National Inst. General Medical Sciences (NIGMS) as part of the Institutional Research and Career Development Award (IRACDA) program. However, training postdocs for teaching careers has been a function of the Graduate School of Arts and Sciences for a number of years. A teacher-training program for WFSM postdocs was institutionalized in 2009 when the Office of Postdoctoral Affairs was opened within the Graduate School under the direction of Asst. Dean Dwayne Godwin. Under the advisement of the Graduate School Professional Development committee, this program has been directed by Drs. Allyn Howlett (Physiology and Pharmacology) and A. Daniel Johnson (Biology).

Postdoctoral researchers who participate are assigned to teach a block of lectures with laboratories and homework assignments, attend at least 3 hours of workshops or seminars related to instructional activities, and prepare an up-to-date teaching portfolio complete with a well-constructed teaching philosophy statement. Teaching opportunities have been offered from neighboring institutions: WSSU (an HBCU), Salem College (a women's college), North Carolina Agriculture and Technology (NCA&T, an HBCU), North Carolina Central University (an HBCU), and WFU neuroscience program.

WFSM is training a population of more than 175 biomedical postdoctoral researchers, who are derived from an international and national pool. There are currently more than 80 postdoctoral trainees in the laboratories of the 45 participating PRIME faculty. Since its inception, a total of 24 postdoctoral and 35 advanced pre-doctoral trainees have participated in these teacher-training instructional activities. The postdoctoral trainees have come



from Ph.D. programs at institutions across the country, including Louisiana State Univ., Cornell Univ., Univ. AR, East Carolina Univ., Eastern Virginia Medical School, Univ. Texas Southwestern Medical Center of Dallas, Univ. Louisville, Loma Linda Univ., and Univ. Massachusetts Medical School. There is diversity in the career paths that have been taken to research, with Ph.D. degrees from a broad range of biomedical disciplines. A number of postdocs come with MD, DDS, DVM, or dual Ph.D./clinical degrees, which is important in the environment for training translational researchers.

Nearly all of the participants complete their training and go on to employment opportunities in academic or commercial enterprises. Of the postdoctoral participants in teaching activities, more than half are now in academic positions in which teaching is a component of their effort, and the others are still currently in postdoctoral training. Since 2009, there have been three predoctoral and five postdoctoral trainees associated with the teaching program who come from underrepresented minority groups, and all of these scholars have successfully gone on to productive academic positions appropriate for their career stage.