

SHAW – UNC UNDERGRADUATE PROGRAM IN PROSTATE CANCER RESEARCH AND TRAINING (SUUPPRT)



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ABSTRACT

During his lifetime an African-American man has a 19% chance of being diagnosed with prostate cancer and a 5% chance of dying from the disease. These figures are all the more startling when compared to the rate for Caucasian men of similar ages: African-American men are 60% more likely than their white counterparts to develop prostate cancer and two to three times more likely to die of their disease. Factors contributing to this disparity likely include a more biologically aggressive form of prostate cancer in some African American men, diagnosis at a more advanced state of the disease, differences in treatment choices or regimens, dietary factors, genetic factors, differences in prostate cancer screening and care-seeking behavior and other health care system interactions. Conquering this disease will require a multidisciplinary approach encompassing social interactions and norms, host factors, and tumor characteristics.



From 2007 – 2010, Shaw University, the oldest HBCU in the South, and researchers at the Lineberger Comprehensive Cancer Center at the University of North Carolina at Chapel Hill, collaborated on a unique research and training program called SUUPPRT; SUUPPRT was designed to prepare selected Shaw undergraduate students to become tomorrow's culturally-sensitive prostate cancer researchers and public health advocates. Here we report the outcomes of the program.



OBJECTIVES

1. Recruit highly qualified students to the program.
2. Engage students in state-of-the-art prostate cancer research through active participation in hypothesis-driven or problem-solving research projects.
3. Introduce students to the broad scope of prostate cancer research in 3 areas; tumor biology, host factors, and public health issues
4. Inform students regarding career choices in prostate cancer research and prepare them to compete effectively for entrance into graduate school and professional schools to pursue careers in prostate cancer research.

APPROACHES

Recruitment. Rising juniors or rising seniors with majors or minors in biology, chemistry, environmental sciences, mathematics, and social work, and with an overall GPA of 2.8 or greater, were encouraged to apply. Means were used to advertise the program included mass e-mail, visits by program staff to classrooms, a staffed information table at the entrance to the Shaw cafeteria, and prospect identification by instructors.

Research Engagement. Principal investigators engaged in diverse areas of prostate cancer research served as research mentors for a ten (10) week summer research experience for SUUPPRT students. Working side-by-side with graduate students and post-doctoral fellows on cutting-edge projects; SUUPPRT students participated in the design and execution of their experiments, presented their results at lab group meetings, in short progress reports to their peers, and participated in a final poster session including several summer research programs at UNC-Chapel Hill. Training continued during the following academic year as students participated 5 - 10 hours/week in research and community outreach programs at the Institute for Health, Social, and Community Research at Shaw University.

- Research Projects Carried Out by SUUPPRT Students (2007 – 2010)**
- "Testosterone and Dominant Negative Androgen Receptor Suppress Human Prostate Cancer Xenograft Proliferation in Athymic Nude Mice"
 - "Protein Identification Using Mass Spectrometry and Genome Fingerprint Scanning in Normal and Prostate Cancer Cells"
 - "The Effect of Electroporation and SCR siRNA on Gamma H2AX in Fibroblasts"
 - "Loss of p19ARF Accelerates Proliferation in Mouse Prostate Tumorigenesis"
 - "Early-life Health Socialization and Health Seeking Among African American Men"
 - "Effects of Tyrosine Kinase Inhibitors on Prostate Cancer Cells"
 - "Decatenation and DNA Damage G2 Checkpoints in Different Cancer Cell Lines"
 - "Defining the Role of HIF in Prostate Cancer"
 - "Human Excision Repair Factors"
 - "Identifying Proteins in Prostate Cancer Cells Using Mass Spectrometry Data"
 - "Review of Approaches to Reducing Prostate Cancer in African American Men"



SUUPPRT students discuss their research results at the final poster session.

Introduce Students to the Broad Scope of Prostate Cancer Research. Focused workshops and journal clubs introduced SUUPPRT participants to selected areas of prostate cancer research. Workshop leaders were drawn from the faculty at UNC-Lineberger, the UNC Gillings School of Global Public Health, and the Institute for Health, Social, and Community Research at Shaw University.

Summer Workshops, Symposia, and Journal Clubs

- *Major Themes and Challenges of Prostate Cancer* – workshop led by Mary C. Anderson, Executive Director of the Prostate Cancer Coalition of North Carolina, and Dr. Louie Ross, a chronic disease epidemiologist and member of the Institute for Health, Social, and Community Research at Shaw University.
- *Introduction to Prostate Cancer Biology and the Androgen Receptor* – lecture by Dr. Young Wang, a practicing urologic oncologist and prostate cancer researcher at UNC-Lineberger Comprehensive Cancer Center.
- *Prostate Cancer Screening and the PSA Controversy* – workshop led by Dr. Louie Ross from Shaw University, to introduce students to the types screening tests and the controversies about their use and interpretation.
- *Summer Symposium of the Public Health Research Institute and the Program for Ethnicity, Culture, and Health Outcomes* – an annual symposium half-day symposium held at UNC-Chapel Hill and focused on health disparities.
- *Cancer Disparities by Race/Ethnicity and Socioeconomic Status* – Journal Club based upon paper by E. Ward et al (2004, CA Cancer J Clin. 54:78 – 93).
- *Tumor Immunobiological Differences in Prostate Cancer Between African American and European-American Men* – Journal club based upon paper by T. Wallace et al. (2008, Cancer Res. 68:927 – 936).
- *Mutations in the Androgen Receptor and Their Implications for Recurrent Prostate Cancer* – a journal club based upon a paper by J. Duff and I.J. McEwan (2008, Molec. Endocrin. 19:2943 – 2954).

Professional Development Activities. These activities aimed to inform SUUPPRT participants of the variety of career choices available in prostate cancer research and to prepare them to compete for positions in selective graduate programs.

Exploring Career Options

- Students toured the UNC-Gillings School of Global Public Health to learn about career opportunities in public health research.
- Students shadowed a urologic oncologist in the clinic for several days and to discuss career options with the urologist
- Students attended a panel discussion on "Careers in Science" in which Ph.D.s working in pharmaceutical research, biotechnology, academia, science writing, and in design and evaluation of clinical trials talked about their careers and career paths.

Professional Development

- A seminar on how to give an effective 10-minute science talk
- A workshop on how to prepare a scientific poster
- A seminar on how to identify an appropriate graduate school and how to apply to graduate school
- A seminar on writing personal statements for graduate and medical school followed up with a practice exercise with feedback
- A workshop on interviewing skills and a practice session
- A seminar and interactive session on trust and trustworthiness in science
- A GRE review course with practice exams for senior students

RESULTS

In addition to presenting their posters at the Lineberger symposium, the 2008 participants presented their posters at the Institute for Health, Social and Community Research Second Conference on Minority Health, and one student spoke in the Plenary Session about her SUUPPRT experience.

The 2009 participants presented their posters at The Minority Access, Inc., Tenth National Role Models Conference, and one of these students won first place in the research poster category.

During the three years of the program, a total of 19 students applied and 9 were accepted. Two of these were accepted for a second year based upon interest and outstanding performance in their first year of the program. The students were placed in some of the top prostate cancer or cancer research labs at Lineberger Comprehensive Cancer Center. Through research, workshops, and symposia students were exposed to and began to think about some of the key issues in prostate cancer and health disparities research. Family health history analysis brought increased awareness of the dimensions of the problem as two students learned of close relatives who had died of prostate cancer.

Six SUUPPRT students have now graduated from Shaw University and of these three have now entered graduate or professional school with the intention of continuing cancer or health disparities-related research. Two additional students are currently applying to graduate programs.

CONCLUSIONS

We have successfully recruited 9 students from Shaw University and provided them an overview of the scope of issues related to prostate cancer and to the research being done at UNC-Lineberger Comprehensive Cancer Center to address these issues. The students were receptive and eager to learn and appeared to leave the program with an increased commitment to remain active in combating prostate cancer either professionally or as a community activist. Four students have assisted in prostate screening clinics at local health fairs. Over half of SUUPPRT students have applied to graduate or professional school in areas relevant to prostate cancer research.

The impact of SUUPPRT extends far beyond the 9 students trained in this program. Numerous Shaw University students are more aware of prostate cancer and research opportunities as a result of on-campus recruiting activities by SUUPPRT as well as through interaction with SUUPPRT personnel and students in the classroom. Additionally, SUUPPRT has strengthened the already strong foundation of existing research collaborations between Shaw University and UNC-Chapel Hill.