

exploring research as a CAREER

Research is like one humongous puzzle,” explains former STREAMS participant and current Year I student Michele Torres-Winburn. “Your work helps others in their work. You don’t just find a miraculous cure. Everyone puts their bits and pieces into it, and the lucky person who gets that last piece may win the Nobel Prize.”

Michele is one of 46 students who attended the Short-Term Research Experience Access for Minority Students (STREAMS) program at Wright State over the past five years. A nationally funded program of the Heart, Lung and Blood Institute of the National Institutes of Health, this summer program targets undergraduate students. It is designed to increase the numbers of under-represented groups in cardiovascular-related research careers. Recruited nationally, the participants spend the summer living on campus in rooms furnished by the university. In addition, the grant pays them a stipend and provides some travel expenses.

Joseph See, Year II, and Tameka O’Neal, Year I, are also graduates of the program. Of the 46 past participants, 19 are still in college; 6 in graduate research programs; 5 in medical school (3 at Wright State); 7 in graduate training programs; and 6 are employed. Twenty-five percent of Wright State’s STREAMS scholars entered graduate training for research careers upon graduating from college. Only 9 percent of the STREAMS applicants who were not admitted to the program did so, indicating that the program is having an impact upon the career choice of its participants.

Robert Putnam, Ph.D., professor of physiology and biophysics, developed the original proposal funded in 1994 and has served as program director for five years. “The heart of the program is that students do research,” he explains. “Eighty percent of their time, four days out of the five-day week, the students are in a laboratory with a faculty mentor doing research.” On Thursdays, students are involved in career and higher education exploration, ethics in research discussions, scientific journal club seminars, problem-based learning exercises, and oral presentations. After living and working together for the summer, students form supportive networks for each other.

Twenty-seven different researchers in eight departments have served as mentors, involving students in cutting edge, funded research projects in their laboratories. Because larger institutions are able to rotate mentoring responsibilities, the percentage of participation by Wright State’s faculty is commendable, claims Dr. Putnam.

Mentored by Drs. Richard White and Julian Gomez-Cambronero, Tameka, a participant for two summers, believes the program “gave me an edge over someone without research experience. It takes a lot of time and effort to do research, and I think it

“It laid a good foundation and increased my knowledge base of basic scientific principles. I also became more creative and determined.”

goes unappreciated. I was totally overwhelmed at what goes into finding a cure for a disease. And, the experiences I gained in this program helped me get a job in research after graduation.”

Tameka, who was a Wright State biological sciences major, remembers that the program offered her a chance to broaden her horizon. “As an undergrad you are just in your field, but STREAMS let me see so many other different fields. We had to take a journal article and, like a researcher, be able to read it and pick out the

important information. They were totally foreign to me at first, written by Ph.D.’s. At a sophomore level, that is quite a thing to master.”

Joseph, who has wanted to be a physician since he was five, says that he entered the program because it sounded like an “interesting summer job.” Mentored by Drs. Norma Adragna and Peter Lauf, Joseph notes that his experience in STREAMS over three summers “definitely changed the way I thought. It laid a good foundation and increased my knowledge base



Program director, Robert Putnam, Ph.D., oversees the work of Romena Garrett, a biological sciences major at Wright State.



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Michele Torres-Winburn at work in Dr. Michele Wheatly’s lab, 1995.



Gerald Alter, Ph.D., oversees 1999 STREAMS participant Ken Ntukogu, a biology major at Ohio State.

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Brandford Towne, Ph.D. (R), with STREAMS participant Nick Munoz, a recent graduate of St. Mary's College of Maryland.

of basic scientific principles. I also became more creative and determined. When projects didn't go as planned, I'd try, try again.” A graduate of Xavier, Joseph's summer experiences helped him obtain a summer American Heart Fellowship and were “a lot of the reason I came here for medical school. I knew the professors and it felt like home.”

All three current medical students completed major projects and were asked to present their research findings at national meetings. Joseph and Tameka are published authors in scientific journals. Dr. Putnam notes that “the students did such outstanding work that we changed the travel budget so students could present their findings at national meetings. That level of success was a very pleasant surprise.”

Michele, a Wright State chemistry major, worked for two summers with Michele Wheatly, Ph.D., chair and professor of biological sciences. Michele says, “I wanted to be able to learn a lot of concepts firsthand that I was learning in a classroom. The things you don't have to use you don't remember as well. The concepts I grasped in Dr. Wheatly's lab are still so clear to me.” In addition to the science, Michele says that “one of the best aspects of the program is having a personal relationship” with a faculty member that endures after the program ends. “Dr. Wheatly is a figure that I have in my life and a pushing force for me to accomplish. This experience will definitely make me a better mentor for others.”

Dr. Putnam originally “had some reservations about developing the program,” fearing that it might impinge on his research and teaching efforts. Also, he continues, “I was an old, white male. I

didn't know the minority experience and I wasn't sure how well I would relate to the participants.” He needn't have worried. He received extremely high scores from both students and faculty mentors as program director, and all respondents to a recent survey still felt that their participation in STREAMS had been a worthwhile experience. Over the past five summers, students from 28 different universities and 12 different states participated in the program.

“My dream, my fantasy,” says Dr. Putnam, “would be that more faculty would get involved in the program so they can have the kind of experiences I have had. This grant is important to our field and our institution and has heightened Wright State's visibility around the country. Students came away with a real sense that Wright State was a friendly place and that serious research is being done here. You can't let the pipeline dry up. Programs like STREAMS, Horizons in Medicine, and the Science Apprenticeship Program are vital. My hope is that we can advance to the next level and develop graduate and postgraduate training grants.”

Maintaining the STREAMS program is a top priority for the School of Medicine. Mariana Morris, Ph.D., and Shumei Guo, Ph.D., recently submitted the proposal that will fund the program for another five years beginning in the summer of 2000. The proposal has been highly ranked by reviewers, and preliminary discussions for funding are encouraging, according to Dr. Morris. As co-directors, Drs. Morris and Guo will develop thematic areas within the program. Students will be organized into three general interdisciplinary areas: cellular mechanisms, endocrinology/hypertension, and cardiovascular epidemiology.



Tameka (Hayes) O'Neal (R) with fellow STREAMS participant on presentation day.

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Although much of the program will remain the same, Dr. Morris, professor and chair of pharmacology and toxicology, sees the subgroups and the sharing of program responsibility as assets for students. Students will interact more with each other and a group of faculty and can turn to either program director.

“These students tend to be high achievers, and they will complement each other with goal setting and career exploration. My vision,” says Dr. Morris, “is that we are able to give undergraduate students a taste of research so that they can find out what it is like. I hope to have them catch some of the excitement faculty feel toward research. It is, after all, exciting to be able to discover new things.”

Dr. Guo, professor of community health, underscores the importance of these programs. “Given the high prevalence of obesity and hypertension in the U.S. minority populations,” she says, “the need

for encouraging and educating minority students to participate in research is eminent.”

At the close of STREAMS’ first funding cycle, Dr. Putnam, who will remain as a faculty mentor, says, “The most gratifying part for me was getting to know the students. They are a very diverse, dynamic, interesting group. I learned an awful lot about where they were coming from and the challenges they face. They were serious-minded, respectful, hardworking young people. I’ll miss spending time with them.”

From the student perspective, perhaps Tameka sums it up best. “It seems like it was just yesterday when we were in STREAMS. We loved the program and Dr. Putnam. Dr. Gomez (faculty mentor for Tameka’s second summer) even came to my wedding. I came out of this research program with a lot more than I thought I was going to.”

— Judith Engle

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