Measures That Matter
Ten Years of AGEP at SUNY

The Alliance for Graduate Education & the Professoriate

ENGAGE
EMPOWER
EVOLVE

UNIVERSITY AT ALBANY
State University of New York

BINGHAMTON UNIVERSITY
State University of New York

University at Buffalo
The State University of New York

STONY BROOK UNIVERSITY

2000-2010
SUNY AGEP is funded by the National Science Foundation Award # HRD-0450106
Dear Friends & Colleagues:

Graduate education in science, technology, engineering and mathematics (STEM) remains one of America’s greatest strengths. Our nation draws tremendous graduate talent worldwide, and develops that talent into world-class scholars and other professionals for academia, industry, and government. Our country benefits from-and contributes to-this pool of current and future leaders in STEM. As countries develop, and as pressing issues of our time become more and more dependent on scientific and technological understanding, nations hasten to both collaborate and compete, inspiring many advancements and creating new challenges for major scientific research and development. This worldwide demand encourages nations to develop programs and policies that ensure the health of their scientific and technological workforces. As part of the effort to enhance human development in STEM, our country has made a concerted effort to engage and support groups that have been traditionally underrepresented in STEM.

For a decade, the SUNY Alliance for Graduate Education and the Professoriate (AGEP), a part of the national AGEP, has been an exemplary program in the National Science Foundation’s effort to broaden participation in graduate education in STEM. SUNY AGEP institutions (Albany, Binghamton, Buffalo, and Stony Brook) offer a myriad of activities that engage students, faculty, and staff, and thereby enhance access and success for underrepresented groups in STEM programs. SUNY AGEP builds and develops strong communities to support students’ academic, social, and personal needs, and increases the likelihood of students obtaining their graduate degrees. Peer support, sponsored by the SUNY AGEP program, fosters departmental assistance, and foregrounds a self-reflexive approach to graduate education. Faculty in many departments and programs are now researching their graduate program activities and looking at indicators of student success, with the aim of achieving a better match between students and support services. This energizing of the graduate community has led to results that include the following: a 71% increase in the enrollment of underrepresented minority students in graduate programs in STEM since 1999, an increase in underrepresented minority students as part of all STEM doctoral recipients from 2% in 1999 to 5% at present, and a total of 117 STEM Ph.D.’s have been awarded to underrepresented minority students since 2000. In addition, SUNY AGEP staff members—in conjunction with faculty in departments/programs—are working to enhance postdoctoral and graduate advancement opportunities to build bridges to the professoriate. In our ten-year report, which includes formal program evaluations and outreach to professional societies, we show how the SUNY AGEP program continues to be a partner in the national effort to develop models that will improve graduate education for all students.

SUNY AGEP would not be possible without the commitment, collaboration, and tireless efforts of hundreds of faculty, staff, and students within our growing network. I am joined by our many partners in bringing this report to you.

Sincerely,

David L. Ferguson

David L. Ferguson

David Ferguson is Distinguished Service Professor and Chair of the Department of Technology and Society at Stony Brook University. He holds a joint appointment in the Department of Applied Mathematics and Statistics. He has directed numerous projects, including a half-dozen NSF projects, aimed at improving science, technology, engineering, and mathematics education at both the undergraduate and graduate levels. His research and teaching thrusts are in the areas of problem solving, advanced technologies in the learning and teaching of mathematics and science, and socio-technological decision making. Dr. Ferguson is a New York State and national leader in programs to enhance the participation of underrepresented groups in science and engineering. He is the recipient of several awards: U.S. Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring, Archie Lacey Award of the New York Academy of Sciences, and the Engineering Educator Award of the Joint Committee on Engineering of Long Island.
What is SUNY AGEP?

The Alliance for Graduate Education and the Professoriate (AGEP) is a National Science Foundation initiative created by Congress to increase the number of underrepresented (UREP) minority students (African American, Hispanic, American Indian, Alaska Native, Native Hawaiian or other Pacific Islander) earning PhDs in Science, Technology, Engineering and Mathematics (STEM). AGEP is particularly interested in increasing the number of minorities who will enter the professoriate in these disciplines. Each AGEP alliance engages in substantive partnerships to develop and implement innovative models for recruiting, mentoring, and retaining minority students in STEM doctoral programs and helping those interested in academic careers to transition successfully.

Our Program’s Mission

The four State University of New York (SUNY) Centers that make-up the SUNY AGEP alliance are:

- The University at Albany
- Binghamton University
- The University at Buffalo
- Stony Brook University (which is the lead institution).

We work with partners in various programs, such as the SUNY Louis Stokes Alliance Minority Participation (LSAMP), the New York State funded Graduate Diversity Fellowship, and Brookhaven Science Associates, the organization that runs Brookhaven National Laboratory. The initial SUNY AGEP grant was awarded in November 1999 for $2.5 million. In 2005, the project was renewed at an impressive $5.6 million to cover Phase II, marking our tenth anniversary this year. SUNY AGEP seeks to enrich students’ academic experiences by creating an effective network of faculty, students, and administrators who embrace academic excellence and diversity. We provide a wide range of services to underrepresented minority doctoral students in STEM fields as well as to the STEM departments and graduate programs. Our goals include:

- Raising awareness within the campus community about the need to address the historical under-representation of minorities in STEM disciplines;
- Promoting success of underrepresented minorities in doctoral education and academic careers;
- Providing a platform on which to discuss issues related to minority graduate education, and obtaining resources to implement emerging ideas;
- Creating an effective network of faculty, students, and administrators who embrace academic excellence and diversity, both on and off-campus;
- Facilitating transition from the baccalaureate and masters into the Ph.D.; and also the Ph.D. to postdoc and the professoriate;
- Serving as a catalyst for change in practices related to the recruitment and retention of underrepresented minorities by examining issues building collaborations, and spearheading new strategies.

Purpose of this Publication

This report highlights some of the major accomplishments of SUNY AGEP since its inception in 1999. Although it is impossible to summarize the collective contributions of the almost 1000 students, faculty and staff that have been involved in the project over the last decade, our goal is to share the experiences, successes, and transformations that all of us within the national AGEP movement are collectively working to achieve. It is our hope that this report is both a valuable resource for the national AGEP community and a tribute to those who have added to SUNY AGEP’s achievements.
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SUNY AGEP is committed to promoting institutional diversity in order to enhance student growth and development. Research shows that cross-racial interactions positively influence cultural acceptance, rates of community service, and personal growth in other areas of civic responsibility. Diversity in the workforce is also critical for government and business, because it increases economic viability, promotes creativity, and encourages flexibility. The United States is a global leader in producing new knowledge and innovations. The fast pace of growth in the 21st century has introduced new nations as strong contenders in scientific discovery, nations whose strength and competitiveness continue to increase. This has impacted our economy on multiple levels. SUNY AGEP believes our diverse socio-cultural landscape can contribute enormously to our nation’s competitiveness. By nurturing the talents and creative minds of all people in our nation, we will ignite new knowledge and innovation in a magnitude never seen before. But there is much work to be done. Even today, too many underrepresented groups are excluded from social, academic, and professional opportunities, and therefore unable to reach their full potentials.

Over the past ten years, the AGEP program has made a visible impact on our campus communities through carefully designed and implemented activities to increase STEM recruitment and retention. We are witnessing an evolution of our campuses with respect to access and inclusion in graduate education. Collectively, among the four SUNY campuses, we have involved over 1000 faculty and students in reaching significant accomplishments, such as creating a vibrant community of STEM scholars on our respective campuses, doubling enrollment, recruiting over 50% of STEM graduate students, and yielding 34% of our graduates in faculty positions.

Numerous core programming activities, which AGEP offers on each of our SUNY campuses, have become more visibly embedded into the regular recruitment and retention efforts within campus infrastructure. Many program activities focus on providing the necessary academic and professional support systems to enable underrepresented students to flourish in their academic pursuits. Moreover, an increasing number of non-UREP students participate in AGEP activities, indicating that AGEP services and activities are broadly perceived as valuable and effective.

Moving forward, we will pursue aggressive programming to help our Ph.D. graduates transition more quickly and smoothly into competitive postdoctoral positions. One strategy we are currently piloting is a unique type of pre/post-doctoral teaching experience where STEM graduate students, postdoctoral fellows, and faculty mentors work together on developing and implementing courses. We would also like to incorporate online teaching and networking tools in order to be at the cutting-edge of technology. We feel strongly that the work of AGEP has only just begun. It is critical that we not lose momentum on this valuable initiative that is opening new research and professional avenues for underrepresented students and thereby enriching our society in immeasurable ways.

KEY OUTCOMES

Our rate of increase in awarding doctoral degrees to UREP STEM students grew 150% since our baseline year in 1999; versus only 33% for total STEM degrees awarded in the same period.

Enrollment of STEM UREP graduate students increased 71% since our baseline year in 1999—compared to an overall growth of only 37% for all graduate students.

Today, UREP STEM doctorate recipients represent 5% of the total STEM degrees; an increase from 2% in 1999.

We have graduated 117 minority Ph.D. students since our inception in 2000.

An impressive 70% of minority doctoral students in STEM fields and 92% of STEM departments participate in SUNY AGEP program activities.

AGEP activities and services were deemed very important/important for success in graduate school according to 70% of current SUNY AGEP students (2008 survey, 48% response rate, conducted by our external evaluator).

The professoriate has been enriched by 35 new faculty members produced by SUNY AGEP, of which 26 are in tenure track positions at research universities.

Poster presenter Karen Torrejon graduated with honors in Chemistry and will pursue her Ph.D in the College of Nanoscale Sciences and Engineering beginning Fall 2010.
In 1999, Stony Brook University won the first Council of Graduate Schools/Peterson’s Award for Innovation in Promoting an Inclusive Graduate Community. The award provided seed money for the creation of a Center for Inclusive Education on the Stony Brook campus. The CIE was a major step towards institutionalizing the goals and accomplishments of diversity programs such as AGEP. Currently, all graduate level diversity programs operate out of the Center and over ten undergraduate programs are affiliated with the Center through active collaborations. For students, the Center offer a range of services such as advisement, study groups, summer internship opportunities, community building events, professional development seminars and financial awards. For departments, the Center offers assistance with recruitment, conversion and retention issues as well as assistance with grant proposals and external site visits. At the campus level, the Center works to streamline communication and activities to maximize interrelated program resources and efficiency. In a relatively short period of time, the Center has proven its value and demonstrated its ability to take the leadership role in empowering the campus community to promote access and success for underrepresented minority students in graduate education.

Students of Luis Colón use the words “mentor” and “trusted counselor or guide” to describe the University at Buffalo Professor and Chair of Chemistry. Dr. Colón’s achievements as both teacher and mentor were recognized beyond the “ColónLab” when he was honored with a Faculty Mentor of the Year Award from the Compact for Faculty Diversity during its 10th Annual Institute on Teaching and Mentoring in 2005. Professor Colón says one of the reasons he was interested in becoming a faculty mentor was the lack of interaction between faculty and students that he observed during his own graduate studies. Colón says his philosophy is simple: He treats graduate students as if they were colleagues. “They work here, they do research. They are the ones doing the experiments; I give them the ideas.” Today UB enjoys a strong pipeline relationship with Professor Colón’s undergraduate alma mater, the University of Puerto Rico at Cayey. The Buffalo AGEP Program has been instrumental in accelerating the efforts and maximizing the potential that already exists in the Department of Chemistry. And perhaps more importantly, AGEP is also a catalyst for the multiplication of these types of self-sustaining best practice models campus-wide.
SUNY AGEP believes successful recruitment is measured by an increase in new enrollment, successful degree completion, and a positive experience that empowers our next generation of STEM leaders in both academia and industry. The AGEP grant has enabled our four institutions to try a broad range of strategies in search of what works best for our individual campuses or departments, and the knowledge we have amassed over the last decade has earned us credibility as partners and pioneers. Through active involvement with STEM departments we have permanently enriched our scientific and student communities by building new relationships and introducing innovative strategies for growth, inclusion and success.

Our recruitment strategy has four main components:

1. The development of a clear pathway for underrepresented students in STEM fields from undergraduate to graduate education.
2. Empowerment of these students to excel in key areas of academic measures.
3. Assistance in the identification of mutually beneficial matches in the selection process.
4. Raise the visibility of our graduate programs and institutions.

To achieve these goals, we work closely with academic departments and collaborators both on and off campus to reach captive pools of talented underrepresented students who would like to excel in science, and to provide a wide range of support services for students. Every year for example, we participate in national diversity conferences, such as the Annual Biomedical Research Conference for Minority Students (ABRCMS), where a captive pool of excellent science undergraduates with research experience are searching for the best graduate programs. These venues provide valuable visibility for our institutions, allowing us to highlight the developments and resources promoted through AGEP’s diverse community of minority scholars. Our campuses have also developed mutually beneficial relationships with other institutions, faculty, and diversity programs nationally, in an effort to provide a smoother transition for students looking for a supportive academic environment. In order to provide such comprehensive support, we collaborate with other minority-serving student programs, such as LSAMP, through joint programming events, enabling us to leverage resources while moving policy forward.

Our experience has shown that undergraduate students who have been exposed to the graduate school culture—and who have a solid training in research—are more likely to gain admission into graduate institutions, and are much more likely to successfully complete their degrees. Much of our work with pathway development focuses on helping undergraduates maximize their preparation. Both a recruitment and retention mechanism, summer internships offer undergraduate students exposure to

Akua Roach - Ph.D. Candidate, Department of Molecular Pharmacology, Stony Brook University

“In 2003, during my junior year at the University of Maryland Baltimore County, I was accepted into Stony Brook’s AGEP Summer Research Institute. My experience was so enriching that I decided to pursue my Ph.D. at Stony Brook, largely because of the support system that I found in the AGEP program. As a Meyerhoff Scholar and NIH MARC Fellow, it was a support system I had grown to value deeply. I am a few months away from defending my dissertation, and I feel an incredible gratitude to AGEP. I owe so much of my success to the program, and I hope to continue to give back for many years to come.”
independent research and potential faculty advisors in a diverse university community. We also run workshops for undergraduate students on topics, including: What is Graduate School?; Why Attend Graduate School?; Is Graduate School Right for You?; and What Can You Do with a Ph.D.? Speakers typically include the Dean of the Graduate School, a faculty member who serves on admissions committees, a current graduate student, and a representative from the Career Center.

AGEP also provides direct support to STEM departments in their recruitment efforts. One service we offer is financial assistance to defray the expenses related to an admissions interview visit. This service also encourages departments to consider promising students that on paper may seem to have uneven preparation. We also provide Top-Off fellowships as financial incentives to augment departmental financial offers. In this way, we strategically compete against other research one universities. Another key service that departments highly value is AGEP’s assistance with the diversity component of faculty or department grant proposals. This exercise has opened tremendous opportunities for engaging meaningful discussion about the department’s previous trends and future goals. It has also led to opportunities for interdepartmental collaboration, as AGEP has assisted programs in executing, delivering, and achieving profound social and academic development.

**SUNY Graduate Diversity Fellowships**

This fellowship, originally created by the Legislature of New York, is funded by the State of New York and administered by SUNY Central Administration in the Office of Diversity and Educational Equity. Established in 1987, it is a merit-based scholarship program designed to recruit and support underrepresented students who have been admitted to graduate study and contribute to the diversity of the student body across the SUNY campuses. It has become a powerful recruitment tool because of the financial assistance it provides and the prestige that it carries. At most campuses, the focal point for AGEP also serves as the focal point for this fellowship program. By leveraging the SUNY Graduate Diversity Fellowship, AGEP was able to focus on developing other mechanisms to promote the recruitment, mentoring, and retention of underrepresented students in STEM. The result is a rich portfolio of programming activities and services on our campuses to further the mission of AGEP.
When SUNY AGEP began ten years ago, we placed high importance on exploring and understanding issues and factors that help underrepresented students succeed in STEM education. Immediately, it was clear that we needed to build a community of faculty, staff and students that value diversity. We determined key players, built relationships, tested various strategies and eventually gained a reputation of expertise in the area of diversity and academic excellence on our respective campuses. Today we have a vibrant community of scholars through which a wide range of services and activities are implemented for the benefit of the entire campus. As we began to see that faculty, departments and institutions integrate SUNY AGEP into their policy and practices, we know our impact is both real and sustainable.

A large part of the program’s activities center around providing the necessary academic and professional support system to enable underrepresented students to flourish in the pursuit of their academic goals. We continue to hear from students and faculty that the community created, and services provided, by AGEP are of great value to them. Below are highlights of some of our most successful and innovative activities:

RESEARCH CAFE SERIES
Each month AGEP hosts Research Cafes/Luncheons/Brown Bags to provide a platform for AGEP students to share their research progress to a diverse audience beyond their departments. We have found that this promotes cross-disciplinary conversations that foster the scholarship of AGEP participants. Students have used their research café presentations as a springboard towards developing reports and posters later presented at national conferences. This activity is very popular and well attended by professors, graduate and undergraduate students alike.

PEER MENTORING
The professional development of AGEP participants is complemented with peer mentoring relations that help stimulate networking. All four of the SUNY AGEP institutions encourage peer mentoring by providing a programmatic infrastructure to encourage and monitor peer mentoring. The service is available to all AGEP students but we make a special effort to target incoming students. Students report that this activity is extremely useful in “learning the ropes”.

CO-TEACHING PROJECT
With the goal to provide training and development for academic careers, we launched a co-teaching project in order to provide senior level graduate students who are often on research grants an opportunity to continue gaining teaching experience. This allows these students to appreciate the teaching responsibilities of an academic career, making the professoriate an attractive option to private and government supported research positions. The co-teaching model allows for constant feedback which results in improved teaching techniques. It also enhances students’ exposure to the professoriate by encouraging collegial relationships between the students and faculty.

KNOWLEDGE ACQUISITION AND SHARING
SUNY AGEP is a hub for student exchange of scholarly experiences. Students are encouraged to communicate their science and advance their professional skills by participating in academic and professional societies. AGEP hosts de-briefing sessions after meetings, workshops and conferences to promote the dissemination of information and the exchange of programmatic ideas. Sessions are held after post-doctoral/faculty oriented conferences such as The HUTEP Institute on Postdoctorate Preparation, UCSF AGEP Postdoctoral Bootcamp, and the Compact for Faculty Diversity.

CONFERENCE TRAVEL AWARDS
AGEP funds continue to be important to the scholarly growth and professional development of AGEP students through travel awards that support student participation in academic conferences related to the student’s area of study. Each year the AGEP project holds an awards dinner to recognize achievements of its AGEP students, including those who have presented at conferences, have had papers published, and those who are graduating from either their master’s or doctorate.
toral programs. This event includes a keynote speaker, usually an alumnus in the STEM professoriate, who is an excellent role model for our students. The students look forward to this event and appreciate the recognition for their achievements.

**THE “LUNCH WITH THE DEAN” PROGRAM**

We organize lunches with deans from the various STEM disciplines to provide a platform for the invited guests to share their insights and experiences as faculty members and university administrators. Deans in turn learn more about the issues and concerns of minority graduate students and gain the impetus to champion policy changes when necessary.

**SUMMER RESEARCH GRANTS**

AGEP students are eligible to apply for funding to be used to conduct exploratory or continuing research towards their thesis/dissertation during the summer months. The objective of this program is to alleviate expenses associated with specific summer research activities to ensure a more rapid completion of their degree. This competitive funding opportunity is conducted via an application process that takes place in the spring of each year and is very popular among the AGEP students.

**PROFESSIONAL DEVELOPMENT SERIES**

In an ongoing effort to provide our students the tools they need to become competitive in the academic job market we provide unique opportunities to enhance their skill sets. Workshops featuring excellence speakers on topics such as “Building your Vitae: How to Make the Most of Your Time in Graduate School”, Preparing For Life as a Faculty Member”, and “Writing Your Teaching and Research Statements” are consistently well attended by all graduate students. AGEP students have indicated on surveys that they see these workshops as a critical resource for their success.

**COMMUNITY BUILDING ACTIVITIES**

Our respective AGEP Programs continue to host events/activities to foster a strong sense of community among the AGEP students, designed to connect students to each other and to the broader community while providing a supportive environment. We continue to yield good turn-outs each month of AGEP students and their student colleagues. Often faculty and staff join many of the community events and activities, providing a diverse and rich experience for all involved. We frequently invite underrepresented undergraduates from the LSAMP, CSTEP and McNair programs to these events, affording undergraduates the opportunity to learn about graduate school and be encouraged to continue their studies by AGEP graduate students. Positive role models are key to increasing the number of students moving through the pipeline to graduate school.

**ACADEMIC SUPPORT**

Scholars enter a peer review system that will be a determinant in their professional success. Junior AGEP students learn to engage senior graduate students in their mastering of topics in Biochemistry, Molecular Genetics, and Mathematics. AGEP has provided a platform for this valuable feedback to also be shared in the areas of manuscript/grant writing and qualifying exam preparation.

**WRITING TO WIN**

This workshop series emerged from a best practice activity we learned was occurring within a department with a high yield of winners of national fellowships. It pairs winners of national fellowships such as the National Science Foundation Graduate Research Fellowship across the entire campus with current applicants in an effort to provide one-on-one guidance on the preparation of a competitive application. This service has been a tremendous success yielding ten winners and numerous honorable mentions to date.

**AGEP, LSAMP, AND CSTEP VISITS HWI**

The Buffalo AGEP, LSAMP and CSTEP programs visited the Hauptman-Woodward Medical Research Institute, Inc. (HWI), located at the UB Buffalo Medical Campus. The students received an informative tour and seminar about the undergraduate summer research, graduate and doctoral research opportunities available at the institute. Additionally, Dr. Herbert A. Hauptman, Nobel Laureate, met with students to discuss the need for medical research and shared his insight on how he conducted research for over 30 years.

Pictured above (l to r): Elizabeth Colucci, former AGEP Coordinator, Courtney Saenz (Forensic Chemistry), Kingsley Ohikure (Pharmacy), Dr. Herbert A. Hauptman (Nobel Laureate), Bharath Kuppuswamy (Electrical Engineering), Ogubuaga Ejimadu (Biology), Christine D. Wingo, former LSAMP Coordinator at the University at Buffalo.
Dr. Meranda D. Bradley received her Ph.D. in Biomedical Sciences from the University at Albany, in 2007. Currently, she is a guest research fellow in the Oakridge Research Institute for Science and Education program at the Centers for Disease Control and Prevention in Atlanta, Georgia. She is the second African American female to earn her Ph.D. in the Department of Biological Sciences’ Molecular Cellular Developmental and Neural Biology program at the University at Albany, State University of New York, in August 2007. In 2007, she was awarded the teaching assistant of the year award. Her dissertation work with Dr. Robert Osuna involved using DNA microarray analysis to explore gene regulation throughout the Escherichia coli genome by the DNA binding protein Fis. Her current research projects focus on the detection of Bacillus anthracis spores in soil and monochloramine and chlorine disinfection of Burkholderia pseudomallei.

Michael G. Coleman, Ph.D., is a native of Rochester, New York. He received his B.S. in Chemistry from the University at Buffalo in 1998. After four years of developing novel transition-metal organic complexes at the Research and Development division of Praxair, Inc., he joined Professor Huw M.L. Davies’ group at the Rochester Institute of Technology in 2002. As a Visiting Scholar and Faculty mentor position, he developed iron-catalyzed Oppenauer-esterification and cyclopropanation transformations and dirhodium(II)-catalyzed C-H bond activations. In 2007, he received his Ph.D. in Medicinal Chemistry and held an Assistant Professor of Chemistry position at South Carolina State University. Shortly thereafter, he occupied a summer NSF Visiting Scholar and Faculty mentor position at the University of Cincinnati, where he developed iron-catalyzed Oppenauer-like oxidations of alcohols. He later joined the faculty at the Rochester Institute of Technology in 2008. His research interests include the development of synthetic organometallic methodologies towards medicinally relevant targets.

Earning his doctorate in materials science from Binghamton University in 2009, Jasper was a recipient of the Clark Diversity Fellowship and an enthusiastic participant in Binghamton University’s Graduate Community of Scholars. Jasper believes that AGEP helped him to concentrate fully on the challenges of his research. Since his graduation Jasper has had a post-doctorate in materials science program with Professor Wayne Jones at Binghamton. Through his research, Jasper hopes to find materials to replace the limited metals used in solar cells.
Dr. Teresa Shakespeare joined the faculty at Fort Valley State University in the summer of 2009 as an Assistant Professor of Biology. She teaches Genetics and Principles of Biology II. Outside of her teaching endeavors, Dr. Shakespeare spends a great deal of time assisting her students realize their potential to pursue higher education in the STEM disciplines. Since joining the FVSU faculty, she has connected the LSAMP chapter, where she serves as a mentor to three students. Before joining FVSU, she was a postdoctoral research associate at St. Jude Children’s Hospital in Memphis, TN, where she studied pancreatic development and the homeobox gene, Prox-1, as it relates to early onset Diabetes. Dr. Shakespeare holds a Bachelor of Science degree from Savannah State University in Savannah, Georgia, and a Doctor of Philosophy degree in Physiology and Biophysics from Stony Brook University. During her tenure at Stony Brook, she was an active member of the NSF AGEP Program and a recipient of the prestigious W. Burghardt Turner Fellowship.
Central to the mission of the SUNY AGEP program is the nurturing of graduate students from the commencement of their graduate study straight through to their entrance into the professoriate. The University at Albany AGEP Program works towards this mission by holding its annual two day “Preparing for the Professoriate (PFP)” conference on the Albany campus. First envisioned and implemented by Dr. Betty P. Shadrick, AGEP Coordinator at the University at Albany, the PFP Conference strives to meet two primary goals:

- To challenge and encourage underrepresented graduate and undergraduate students in STEM fields to recognize the value they bring to the academy and the educational enterprise
- To provide students meaningful information about the professoriate and to encourage them to enter doctoral programs in the STEM fields with the ultimate goal of entering the professoriate

PFP consistently provides viable information, tools, and strategies for students transitioning into academic careers. The conference also provides an opportunity for students to engage with faculty, leaders, and one another to build a strong national, regional, and local community of underrepresented students pursuing STEM disciplines. Since its inception in 2003, the conference has seen a steady increase in attendance averaging about 62 participants and more importantly, consistently high reviews in the evaluation.

April 24, 2009 marked the sixth installment of the “Preparing for the Professoriate Conference” and its largest student attendance rate in its history. The conference included a tour of the college of Nanoscale Science and Engineering; a motivational talk by Dr. Kenneth Takeuchi, distinguished professor of chemistry from the University at Buffalo; a mentoring talk by Dr. Mark Hernandez from the University of Colorado; a talk about the joys of teaching and research by Dr. John Delano, distinguished teaching professor at the University at Albany; a juried poster presentations with prizes for first, second and third place winners; and concurrent workshops on Curriculum Vitae writing, career planning, syllabus development, writing the dissertation, post doctoral research, negotiating the tenure process, and the importance of perseverance and personality strengths in successfully pursuing an academic career.

AGEP students throughout SUNY regularly attend the PFP, making it an excellent opportunity to nurture a sense of community among students within the SUNY alliance. The AGEP project has enabled the University at Albany to explore the tangible impact of bringing a captive pool of talented minority students in STEM together to discuss the road to the professoriate. We have found that the benefits are not only valuable to the student participants but to the faculty participants as well. PFP has exposed hundreds of students to vital information about a career in the academy through a hands-on learning experience that leaves these students feeling accepted and empowered.
The NSF AGEP program is an important component of Binghamton University’s sustained efforts for campus diversity. One key to its success is the Graduate Community of Scholars (GCOS), an inclusive support group that enables students from underrepresented minorities to form collegial relationships with one another. By hosting social events, seminars, and professionalization workshops for graduate students, GCOS facilitates the development of skills in grant writing, conflict resolution and interviewing skills necessary for success in graduate school and the professoriate.

Student members of GCOS find the program invaluable. In addition to workshops, GCOS offers a peer mentoring program. Under the direction of a faculty advisor, senior graduate students mentor incoming graduate students, who have found the program to be a tremendous resource for a smooth transition into graduate school.

Another important component of the NSF AGEP project at Binghamton University is the course Critical Skills for Graduate Study, which consists of in-class meetings, on-line discussions and peer-review sessions. Students who participate in this course strengthen their research and writing skills for dissertations, conference papers, cover letters, and curriculum vitae. The program has already produced numerous positive results; some participants have published their work in peer reviewed journals, completed doctoral examination area papers, or made significant progress towards their dissertation. This course is now a staple in our winter and summer sessions, and its success has encouraged the development of other classes that address professionalization-related topics such as the responsible conduct of research and college level teaching. It is expected that these courses will continue to bolster retention of AGEP-eligible students and advance diversity in the STEM disciplines.

In the spring of 2009 the NSF AGEP project at Binghamton initiated a co-teaching project. One of the aims of this program is to encourage underrepresented minority students to enter the STEM professoriate. In this project, a senior graduate student is paired with a faculty mentor to plan and implement a course together. Students participants experience the rewards of teaching, acquire tools to manage the responsibilities of an academic career, and form collegial relationships with faculty, who provide constant feedback for improved teaching techniques. One participant noted that, “This program has provided me the experience necessary to feel comfortable planning a full semester curriculum; working with students, and handling bureaucratic departmental issues related to the classes that I teach.”

Finally, to further the efforts to recruit underrepresented minorities into the STEM professoriate, the NSF AGEP program initiated a pilot project supporting a postdoctoral fellowship for a STEM graduate. In addition to continuing his or her research, the fellow teaches one course during which s/he collaborates with a faculty mentor in the design, preparation and teaching of a large undergraduate course.

All of these projects have provided significant opportunities to Binghamton University students and have advanced the University’s mission of sustaining a truly diverse graduate student body on this campus.

“GCOS, through its workshops, allowed students that wouldn’t normally interact with each other to form bonds and networks unlike any other program on campus.”

-Dandrielle Lewis, Ph.D. candidate in Mathematical Sciences
The centerpiece of the AGEP program at the University at Buffalo is the very successful monthly AGEP Research Lunch program. Each month, an advanced-level AGEP student presents his/her research to the wider AGEP community. Since the Spring of 2006 when this programming activity began, over 37 talks and lunches have taken place.

These monthly presentations provide AGEP graduate students the opportunity to share their research with peer scientists outside of their discipline. As a result, AGEP has cultivated a community of scientists who are educated about the diverse scientific work occurring at the University at Buffalo. With AGEP graduate students dispersed across 37 departments and spread over three campuses, these talks provide opportunities for scientific collaboration, discussion, and support that transcends departmental and geographic boundaries.

AGEP graduate students are genuinely interested in attending the monthly Research Lunches and even look forward to such occasions. We gather for lunch, announcements, and conversation. Then the speaker typically gives a 30-40 minute talk, followed by a question and answer period. Lively questions, comments, and discussions ensue. Students and staff linger for conversation and community.

Even though the research may be outside of their field, we have found that AGEP graduate students continue to attend in significant numbers because this community of multi-disciplinary scientists can not be found elsewhere on campus. Over 58% of all AGEP graduate students participate regularly/frequently in this Research Lunch program.

Undergraduate students from the Louis Stokes Alliance for Minority Participation (LSAMP) program, the McNair Scholars program, and the Collegiate Science and Technology Entry Program (CSTEP) are also invited and actively participate in the Research Lunch program. It is a positive and empowering activity for minority undergraduate student researchers to "envision themselves" as graduate students and future Ph.D.s. This program has strengthened UB's pipeline of undergraduates going on to graduate school.

Building on the success of the Research Lunch Program, UB's AGEP launched a “Lunch with the Dean” program. These lunches, with successful scientists and academic administrators, have been informative for both students and deans alike. AGEP graduate students have an opportunity to hear about the personal struggles and triumphs of successful scientists and researchers. They learn more about the role of academic administrators, and obtain insider information and suggestions for success. Deans meet our AGEP graduate students firsthand in an informal setting, allowing for honest and open dialogue.

AGEP has had such lunches with the Provost and Executive Vice President for Academic Affairs, Dr. Satish Tripathi; Dean of the College of Arts and Sciences, Dr. Bruce McCombe; Dean of the School of Engineering and Applied Sciences, Dr. Harvey G. Stenger; Vice President for Research, Dr. Jorge V. José; and Professor of Pharmaceutics and Associate Dean of Graduate and Postdoctoral Education, Dr. Marilyn Morris.

“The AGEP programming and enrichment events are essential to the success of underrepresented minorities in technical fields. As the world of research goes interdisciplinary, this program allows us to engage and solicit assistance from our peers in other areas who may be researching different aspects of our areas.”

-Nadine James, Graduate Student, Roswell Park Department of Molecular & Cellular Biophysics and Biochemistry
The Summer Research Institute (SRI) serves the dual roles of being an effective recruitment and retention tool. The result is better prepared candidates, better prepared admissions applications, and a much better sense of the expectations in graduate school. Summer interns are thus attractive candidates for graduate programs. Interns that matriculate into our own graduate program seem to fare better during their first year, as they have assimilated to the environment, developed a rapport with people they can turn to for help, and feel a stronger sense of self-confidence. This is especially vital given the high attrition rate during the first year of graduate school, particularly in STEM disciplines.

Every year we receive up to 100 applications from well qualified minority undergraduates across the United States and Puerto Rico for 8-12 internship positions. Applications are reviewed by faculty members, and placements are offered based on academic performance, letters of support, and appropriate matches between students’ interests and participating faculty.

The Stony Brook AGEP SRI has been strategically designed to provide comprehensive training for, and exposure to, graduate study. There are a series of seminars, workshops, and community building activities led by doctoral students who have excellent leadership qualities and a strong commitment to giving back. The main components of the SRI are:

- Hands-on research training by Stony Brook faculty and research groups;
- A seminar on research methods led by two advanced AGEP students, including components on journal searches, oral presentation skills, and poster development;
- A seminar on intensive writing and graduate school preparedness, also led by two advanced AGEP students, including components on writing effective personal statements, attending national conferences to present posters, and preparing for admissions interviews;
- Workshops on related topics, including an opportunity to interact one on one with the Dean of the Graduate School and faculty members serving on admissions committees; and
- Weekly community building activities.

The training provided by our summer programs is an activity that has yielded some of SUNY AGEP’s most valuable outcomes.

**Key Outcomes**

As of summer 2010, we have proudly trained 116 undergraduate interns. Though it is particularly challenging to overcome the high frequency of “change of residence” students for the 18-28 demographic, we have made a concerted effort over the years to maintain contact with past interns. Below, are some statistics regarding these student populations:

- **Graduate Matriculation:** 39 of our interns have matriculated into graduate school (20 at Stony Brook). Of these 39 students, 11 have already earned Ph.D.’s, 3 have earned medical/professional degrees, and 8 have earned master’s degrees.
- **Institutional Data:** 49 interns came to us from SUNY, 16 from CUNY, and 19 from Historically Black Colleges or Universities. Of the 32 from other universities, 11 were Meyerhoff Scholars from the University of Maryland, Baltimore County.
- **Ethnic/Racial Backgrounds:** 72 were Black/African American, 37 were Hispanic, and 7 were Asian/Pacific Islander.
- **Undergraduate Profiles:** At the time of their application to the program:
  - the average cumulative GPA was 3.35;
  - about half of the applicants indicated belonging to at least one undergraduate student diversity program such as LSAMP, MARC or McNair;
  - 65 were majoring in the Biological Sciences, 32 in Engineering and Applied Sciences, and 19 in Physical Sciences;
  - 92 aspired to be a college/university professor or researcher.
- **Empowerment:** In a recent survey, former interns indicated their agreement that the SRI strengthened their interests in pursuing a graduate degree and a career in academia.

**Photo Credits:** Jin Hur

“Thanks to SRI, I became more confident in my abilities to pursue a Ph.D.”

-Cindy Leiton, 2006 Cohort

Cindy completed her undergraduate degree in biology from the University of New Haven in Connecticut, and is currently a doctoral student in the Department of Molecular Pharmacology at Stony Brook University. Her advisor is Dr. Holly Colognato, the same faculty member who mentored her SRI project. In addition to being awarded the W. Burghardt Turner Fellowship, Cindy won the NSF Graduate Research Fellowship in 2009.
The evaluation of SUNY AGEP has uncovered ample evidence that AGEP plays an important role in the lives of under-represented minority STEM students in the participating SUNY universities. From initial recruiting, through orientation, financial support, advising, social support, and mentoring, the AGEP staff and activities help students to achieve success in graduate school, overcome challenges, and plan productive futures. The program promotes a positive attitude toward the professoriate and encourages graduates to find satisfaction in careers that combine research and teaching. AGEP also works to sensitize departments and faculty to the needs of minority students and to the benefits derived from recruiting minority students.

Data were collected through visits to the participating universities to gather firsthand knowledge of people and places as well as through surveys that add the statistical weight required to judge whether or not goals have been achieved. The following is a brief overview of the major findings:

**Finances**
Doctoral students in the STEM disciplines expect to be supported by research grants, teaching assistantships and fellowships. But AGEP provides additional financial assistance that often makes the difference between survival and real progress in graduate school. Sixty-three percent of students reported that the financial assistance from AGEP was very important to them.

Quote from an AGEP Student: “I have visited one of the most prestigious labs in my field with the support of the AGEP. I’ve also attended scientific conferences in which I presented my research.”

**Academic Preparation and Research**
Graduate school presents a major challenge to students, particularly minority students who are often the first in their families to graduate from college. The SUNY AGEP institutions, with funding from varied sources, have helped undergraduates gain both research experience and insights into the world of graduate studies through summer programs. More than 90% of participants in the Stony Brook’s SRI program reported increased interest and understanding of research.

**Orientation, Social and Academic Support**
Minority graduate students have often attended urban commuter colleges. The evaluation focuses on evidence that the participating minority students generally retain very close ties to their extended families, and are sometimes expected to continue providing emotional support to family members. In addition, minority students may be few in number and feel isolated in their departments. Three-quarters of the AGEP students reported that academic and social support were important or very important to them.

Quote from an AGEP Student: When you have someone who is exactly like you and going through the same things, it gives you the strength. It’s a good thing. For most of us there may be only two or three minority students in the department. You come to AGEP and see maybe 50 minority students you say, “My goodness, there are that many of us. It is wonderful.”

**Mentoring, Networking, and the Scientific Community**
In addition to rigorous study and research, graduate school in every discipline introduces students to the scholarly community. SUNY AGEP facilitates this process, sensitizing faculty to the circumstances of minority students, and bringing students together through an integrated peer-mentoring program.

Quote from an AGEP Student: “Thirteen started the PhD program with me and I was the only minority. I was used to an HBCU so this was shocking. Then, AGEP took me to a conference for minority STEM students. So the AGEP connection was amazing, helping me adjust and focus on what I was here to do.”

**The Professoriate**
One of the more important long-term goals of AGEP is to help create faculty who will be the role models for the next generation of minority college students. In view of this goal, AGEP participants are encouraged through meetings, seminars, conferences, and mentoring to consider careers in academia. But academic positions are competitive and students in the STEM disciplines have varied interests and options. Of AGEP students surveyed, 50% reported strong career interests in the professoriate.
Suny Albany

Marjorie Pryse, Dean, Graduate School
AGEP Co-Principal Investigator

Betty Shadrick, Director of Graduate Student Diversity
AGEP Program Coordinator

Graduate Assistants:
Michael Bismarck Brako
Crystal Campbell
Alpana Chibber
Amirah Cousins
Dean DeFreitas
Sherida Johnson
Christopher Valle
Irene Valdes
Brittany Wiley

Former Staff:
Jeryl Mumpower, Dean, Graduate School
AGEP Co-Principal Investigator 2000-2004

University at Buffalo

Myron Thompson, Associate Provost, Executive Director of the Graduate School
AGEP Co-Principal Investigator

Susan Kubicki, Assistant Director, Graduate School

Colleen White
AGEP Program Coordinator

Graduate Assistants:
Lara Cook
Laura Wirth

Former Staff:
Elizabeth Colucci, Program Coordinator 2005-2009

Binghamton University

Nancy Stamp, Dean, Graduate School
AGEP Co-Principal Investigator

Dara Silberstein, Associate Dean, Graduate School

Graduate Assistants:
Amy Groleau
Mariana Morris-Grajales

Former Staff:
John Kilmarx, Co PI 2005-2006
Fernando Guzman, Faculty Liaison 2005-2008
Willie Everett, Program Coordinator 2007-2009
Gervlyn Auguste, Program Coordinator 2007
Adzele Kitissou-Jones, Program Coordinator 2005-2006

Stony Brook University

Lawrence Martin, Dean, Graduate School
AGEP Co-Principal Investigator

Nina Maung-Gaona, Assistant Dean for Diversity
AGEP Program Administrator

Kathryne Piazzola, AGEP Program Coordinator

Alexandra Corrales de Eilers, Postdoctoral Fellow

Graduate Assistants:
Karin Wang
Doreen Pierce
Amy Braksmajer
Samantha Hassell
Ana Zevallos
Carlos Gamboa
Rose Saint Fleur

External Evaluator
Leo Gafney