

Research and Education Activities:

The Bridge-to-the-Doctorate Program, designed by PR-LSAMP and successfully implemented during the past eight years, includes the following activities and/or components:

a. Stipends and Bonuses for Demonstrated Academic Progress. BD Fellows receive each year of the award a monthly stipend of \$1,500 and three bonuses of \$4,000 each (one in December, one in May and one in July) for excellence in academic performance, for a total annual fellowship of \$30,000 for two years. The BD Program also covers during this two-year period the Fellows' tuition costs, basic health insurance and basic institutional fees.

b. Travel Funds to Attend Scientific Meetings/Conferences BD Fellows receive \$1,500 in travel stipends per year to attend scientific conferences such as the annual meeting of the American Association for the Advancement of Science (AAAS), the American Chemical Society (ACS), or the American Physical Society. (see table 4 in attached PDF file)

c. Funds for Educational Materials: BD Fellows receive funds each year of the award for educational and lab materials (\$1,000 per year).

d. A Support Program to Enhance the Academic Preparation of BD Fellows In addition to the fellowship, fellows participate in a Support Program to enhance their academic preparation and their integration into the BD initiatives to sustain the K-16 educational pipeline. This program helps to ensure that BD Fellows successfully complete their first two years of graduate studies, and that they enroll, remain, and graduate from a doctoral program in a STEM field. As part of the Support Program, BD Fellows participate in 12 to 16, 3-hour seminars, each year (see tables 2 and 3 in the attached PDF file). Since attendance to all seminars is mandatory, topics and dates are selected by consensus by the Fellows and the BDP Coordinator. Speakers include internationally renowned scientists, local researchers, and industry representatives. Speakers also serve as role models as they share with participants their academic and professional development (see tables 2 and 3). Fellows and mentors offered research talks as preparation to the Transdisciplinary Scientific Meeting, where collaborators of the fellow's mentors will be offering scientific talks to a wide audience. These seminars are opened to all graduate STEM students at the institution. Also, Fellows from all cohorts attend annually the Puerto Rico Interdisciplinary Scientific Meeting (PRISM) and The Best Practices Conference on Teaching and Learning, sponsored by PR-LSAMP.

e. Mentoring: Each BD Fellow serves as mentor to an undergraduate student participating in the PR-LSAMP Undergraduate Research Experiences Component. This strategy supports the PR-LSAMP system-wide approach to educational reform by linking all educational levels, and to integrating research and education (see table 5 in attached PDF file).

f. BDP Fellows Visits to Secondary Schools and Outreach Activities Schools: BD Fellows visit secondary schools to serve as role models for the students. BD Fellows talk to the students about his/her academic experiences during their high school, undergraduate and graduate years, and about their future career plans. They give special emphasis to the role that undergraduate research experiences play in their academic preparation. As role models they motivate them to excel academically and exhort them to continue careers in STEM fields. Visits are scheduled throughout the academic year 2010-2011. During this academic year, BD Fellows participated as presenters in NanoDays, a national outreach event that brings nanoscience and technology to the general public. During this activity, BD fellows worked together with undergraduate STEM Students and with trained high school students (see table 6 in attached PDF file).

g. Presentations at the Puerto Rico Interdisciplinary Scientific Meeting (PRISM) All BD Fellows present their research projects at PRISM, the largest annual local scientific forum sponsored by PR-LSAMP and the local chapter of the American Chemical Society (see table 7 in attached PDF file).

h. Additional seminars and workshops offered by the STEM Departments and PR-AGEP. Each STEM Department offers between 10 to 15 scientific seminars per semester to enhance students' academic and research preparation. The Puerto Rico Alliance for Graduate Education and the Professoriate (PR-AGEP) offers activities that connect BD Fellows to the doctoral program. Incoming graduate students participate in the Teacher Assistant Training Program (TATP) three weeks prior to the beginning of the semester. During this training students participate in workshops to develop their pedagogical, communication, scientific research and mentoring skills. During the academic year, PR-AGEP students serve as mentors and role models to the BD Fellows; and BD Fellows and AGEPE students participate in

Skills Development Workshops to better prepare them for the Professoriate. Some BD Fellows, as they enter their third year of studies, serve as AGEP mentors to incoming Fellows. All TAs are encouraged to participate in teaching/learning workshops offered by the Graduate Programs in the Rio Piedras campus and to consider career opportunities in academia. Fellows also participate in the PR-EPSCoR Annual Conference, present their research projects in the poster session, and benefit from the Conference's activities. BD Fellows become familiar with the GK-12 program "From Hectares to Nanometers" in order to infuse them with interdisciplinary teaching and learning methodologies and techniques early on in their career. BD Fellows participate of GK-12 workshops and visit GK-12 schools as part of the Role Model Program (see table 6 in attached PDF file). The BD activities, together with the on-going activities described above, have proven essential to the preparation and success of our graduate students. Cohort VIII Fellows have been integrated into the established BD Program.

Findings: During the first year of Cohort VIII these have been the major accomplishments of our BD Fellows:

1. An eighth cohort of twelve BDP Fellows began graduate studies in August 2010, for a total of 94 BDP fellowships awarded by PR-LSAMP under this initiative. Nine (9) of twelve fellows have a GPA of 3.5 or higher; 3 of these have a GPA of 4.0. Due to the lack of academic progress we substitute two of the fellows with two other that fulfilled the qualifications of the program (see table 1 in attached PDF file.)
2. All active fellows approved their graduate courses with an average of 11 credits per student per semester (see table 1 in attached PDF file).
3. Fellows have benefited from seven workshops, and twenty six scientific conferences. (see tables 2-3 in attached PDF file).
4. All fellows participated as leaders and presenters in the NanoDays activities as part of their outreach component.
5. Six of the twelve fellows traveled to present their work at four major scientific meetings (see table 4 in attached PDF file).
6. Each fellow served as a mentor for one undergraduate student conducting research under the PR-LSAMP undergraduate research program (see table 5 in attached PDF file).
7. All fellows visited at least one school to serve as role models for secondary school students during the Role Model and Outreach activities. At the end of the reporting period fellows will have offered 10 visits to participating schools, seven of them are at NSF-GK12 NSF Funded Program (see table 6 in attached PDF file).
8. Two fellows offered science workshops for secondary science teachers at the Arecibo Observatory and the Interamerican University (see table 6 in attached PDF file). All fellows presented their research work in the Puerto Rico Interdisciplinary Scientific Meeting (PRISM) (see table 7 in attached PDF file).
9. 24% of the Hispanics who received a PhD nationwide in a natural science field, from 2003 to 2008, received their BS degree from a PR-LSAMP institution (NORC data) (see table 8 in attached PDF file).
10. 21% of the Hispanics who received a PhD nationwide in engineering, from 2003 to 2008, received their BS degree from a PR-LSAMP institution (NORC data) (see table 9 in attached PDF file).
11. The University of Puerto Rico awarded a total of 49 PhD degrees in STEM fields in academic year 2009-10 (see table 10 in attached PDF file).

Training and Development:

During academic year 2010-11 fellows have benefited from seven workshops, and twenty six scientific conferences (see tables 2-3 in attached PDF file).

Outreach Activities:

Each BDP fellow was scheduled to visit a public secondary school to serve as a role model to these students during the academic year 2010-2011. The visiting BD fellow shares with students their high school and undergraduate experiences, including preferred courses, teachers and professors that were their role models, and insights on how to succeed in a university environment, but most importantly, they serve as role models to these high school students, and motivate them to pursue careers in STEM fields. They also offered two workshops for science teachers at the Interamerican University and the Arecibo Observatory. (see table 6 in attached PDF file).

All BDP Fellows participated as presenters in NanoDays at Plaza Las Americas, a national outreach event that brings nanoscience and technology to the general public. During this activity, BD fellows worked together hand in hand with high school students to show and demonstrate science activities related to nanoscience and nanotechnology. In addition Ms. Angelica Erazo participate in another NanoDays activity celebrated at Miami Dade College, North Campus.

Journal Publications**Books or Other One-time Publications****Web/Internet Site****URL(s):**

www.prlsamp.org

Description:

The PR Bridge to the Doctorate program shares the PR-LSAMP website.

Other Specific Products:**Contributions:****Contributions within Discipline:**

During this academic year, eleven BD Fellows mentored one undergraduate student, serving as role models and guiding them in the development of a research project. BD Fellows serve as mentors to provide the necessary skill for them to continue to graduate school. These undergraduate students will be tracked using the PR-LSAMP tracking system (see table 5 in attached PDF file).

Contributions to Other Disciplines:

During this academic year, BD Fellows participated as presenters in NanoDays, a national outreach event that brings nanoscience and technology to the general public. During this activity, BD fellows worked together hand in hand with high school students to show and demonstrate science activities related to nanoscience and nanotechnology to the general public. Since the public that participates comes from different educational backgrounds we are contributing to their general scientific knowledge, therefore contributing to impact other disciplines.

Contributions to Human Resource Development:

If we track the baccalaureate origin of the nationwide PhD recipients, the National Opinion Research Center (NORC), which reports Ph.D. data, shows for the years 2003 to 2008 that:

- 24% of the Hispanics (U.S. citizens) that obtained a PhD in a Natural Science field nationwide, received their BS degree from a PR-LSAMP institution (367 out of 1,555). UPR-Rio Piedras and UPR-Mayaguez are the leading baccalaureate institutions of U.S. Hispanic Ph.D.'s in Science.
- 21% of the Hispanics that obtained a PhD in Engineering nationwide, received their BS degree from a PR-LSAMP institution (105 out of 511). UPR-Mayaguez is the leading baccalaureate institution of U.S. Hispanic Ph.D.'s in Engineering.

Table 8 (in attached PDF file) shows the leading U.S. Baccalaureate Institutions of U.S. Hispanic Ph.D.'s in the natural sciences for the 2003-2008, and Table 9 (in attached PDF file) for engineering fields. Other institutions in Puerto Rico with BS graduates that went on to receive a PhD during this period of time were: UPR-Humacao (39); UPR-Cayey (26); UPR-Medical Sciences Campus (16); Pontifical Catholic University of Puerto Rico (13); Inter American University (13) and UPR-Aguadilla (6). In summary, institutions in Puerto Rico accounted for 38% of the baccalaureate origins of the Hispanic PhDs in the natural sciences from the top 25 institutions of Hispanic doctorate recipients, and 24% of all institutions.

At the local level, the University of Puerto Rico's three graduate institutions, UPR-Rio Piedras, UPR-Mayaguez and UPR-Medical Sciences awarded 49 PhD degrees in science and engineering in academic year 2009-2010 (see table 10 in attached PDF file). Table 11(in attached PDF file) presents the total number of PhD degrees awarded by the three campuses from 1990 to 2010.

Contributions to Resources for Research and Education:

N/A

Contributions Beyond Science and Engineering:

N/A

Conference Proceedings

Special Requirements

None