

Research and Education Activities:

The Bridge-to-the-Doctorate Program, designed by PR-LSAMP and successfully implemented during the past seven 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 National 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 Physics Society. All Fellows will attend during year one of the fellowship, the national NSF/JAM Meeting.

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 4-hour seminars each year. (See tables 2 and 3) 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. 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.

f. BDP Fellows Visits to High Schools: BD Fellows visit public middle schools and high schools to serve as role models for high school 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 for 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 trained high school students.

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 4.

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 Fellows participate in Skills Development Workshops to better prepare them for the Professoriate and the AGEP Peer Mentoring Program. The STEM Departments and PR-AGEP offer a Teaching Assistant (TA) Training Program to broaden and deepen TA teaching skills. All TAs are encouraged to participate in teaching/learning workshops offered by the

campus and to consider career opportunities in academia. Some BD Fellows as they enter their third year of studies, serve as AGEP mentors to incoming Fellows. 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 interdisciplinary teaching and learning early on in their career. BD Fellows participate in GK-12 workshops and visit GK-12 schools. The BD activities together with the on-going activities described above have proven essential to the preparation and success of our graduate students. Cohort #6 Fellows have been integrated into the established BD Program.

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

1. A seventh cohort of twelve BDP Fellows began graduate studies in August 2009, for a total of 82 BDP fellowships awarded by PR-LSAMP under this initiative. Seven (7) of twelve fellows have a GPA of 3.5 or higher; 3 with a GPA of 4.0. (see table 1 in attached PDF file)
2. All fellows approved their graduate courses with an average of 20 credits per student per year (see table 1 in attached PDF file).
3. Fellows have benefited from seven workshops, and seventeen scientific conferences. (see tables 2-3 in PDF file).
4. All twelve fellows presented their research work in the Puerto Rico Interdisciplinary Scientific Meeting (PRISM) (See table 4 in PDF File).
5. 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).
6. 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).
7. The University of Puerto Rico awarded a total of 52 PhD degrees in STEM fields in academic year 2008-09.

Training and Development:

During academic year 2009-10 Fellows have benefited from seven workshops, and seventeen scientific conferences. (see tables 2-3 in PDF file).

Outreach Activities:

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.

Each BDP fellow is scheduled to visit a public middle school or high school to serve as a role model to these students during the academic year 2010-2011. The visiting BDP 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.

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, 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.

Contributions to Other Disciplines:

N/A

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 6 (in 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 7 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 52 PhD degrees in science and engineering in 2009. Table 8 presents the number of PhD degrees awarded by these three campuses in 2008-09 by science and engineering field. Table 9 presents the number of PhD degrees awarded by the three campuses from 1990 to 2009.

Contributions to Resources for Research and Education:

N/A

Contributions Beyond Science and Engineering:

N/A

Conference Proceedings

Special Requirements

None