
CASE STUDY

Princeton Diversity Programs in Molecular Biology and
Quantitative & Computational Biology

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Case Study:

Diversity Programs in Molecular Biology and Quantitative & Computational Biology

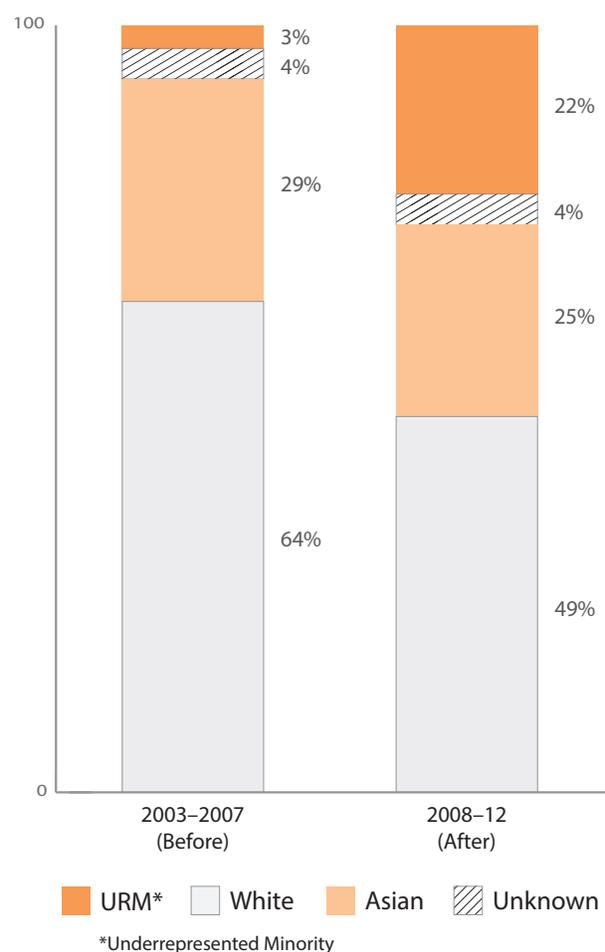
Founded in 2007 in response to pressure from the National Institutes of Health (NIH), the Princeton Diversity Programs in Molecular Biology and Quantitative & Computational Biology have made significant progress in dramatically increasing the number of underrepresented minority (URM) doctoral students in four life sciences doctoral programs: Molecular Biology (MOL), Quantitative & Computational Biology (QCB), Neuroscience (NEU), and Ecology and Evolutionary Biology (EEB). A description of the program is provided below.

The percentage of URMs—including African American, Hispanic, and Native American students—in each entering molecular biology class increased from 3% in the period from 2003–07 before the program started to 22% in 2008–12. This representation greatly exceeds the NIH recommendation of 10% URMs and surpasses the 16% of URM college students who major in biology.

The pioneering class which began in 2008 is already highly distinguished. Each member of this cohort of eight URM students applied for and was awarded a fellowship or honorable mention: two were awarded New Jersey Commission on Cancer Research predoctoral fellowships, two were awarded the highly competitive NIH pre-doctoral awards, and four were recipients of the prestigious National Science Foundation (NSF) Graduate Fellowships (a fifth received an honorable mention). This represents the highest number of NSF fellowships that any molecular biology graduate class has ever been awarded.

There are several factors that contributed to the success of this program. One was the strong incentive provided by the NIH, which has made enhanced recruitment and retention of URMs a key criterion for its grant awards, including the funding of the training grants that support molecular biology's doctoral training program. Based on the program's success, NIH not only renewed its funding but awarded the department additional resources for doctoral education. Another critical factor was strong leadership from senior faculty member David Botstein, department chair Lynn Enquist, and program director Alison Gammie, who made the case that a diversity program is critical to future departmental success.

Figure 1:
Incoming class average composition before and after the diversity initiative (MOL/QCB/NEU)



Molecular Biology also benefited from structural factors that are not necessarily transferable to other academic units. The department is among Princeton's largest and most well-funded, and it was able to dedicate substantial resources to this effort. It also benefited from a robust national pool of URM undergraduate biology majors who had the training and aptitude to be successful at Princeton.

At the same time, many of molecular biology's effective practices can be applied to other academic and administrative departments and to increasing

diversity among other populations (including faculty members). These include the importance of strong leadership and ambitious goals, a data-driven approach to understanding challenges and developing solutions, engagement and tracking individuals early in the pipeline, aggressive recruitment to increase the diversity of the pool, candidate evaluation using a holistic approach, investment of time in cultivating candidates, and participation in continuous and honest self-evaluation.

The Diversity Program includes five components:

(1) An undergraduate summer research program.

Between 2008 and 2012, 51% of all summer program visiting students were URM. The program is molecular biology’s best URM doctoral recruiting tool as program alumni make up 15-20% of each entering cohort.

(2) A summer sabbatical program for faculty members from Morehouse and Spelman, two highly respected historically black colleges. The strengthened ties between Princeton and these schools has resulted in an increase in the number of minority applicants to the summer undergraduate and doctoral programs.

(3) Aggressive recruitment, which includes an active presence at key biomedical conferences, a system to engage and track prospective students, and fee waivers for those reluctant to apply. Through these efforts, the number of molecular biology URM applicants increased from an average of 16 between 2003-07 to an average of 59 between 2008-12.

(4) A more holistic approach to evaluation of doctoral candidates. An analysis of molecular biology admissions data revealed that, relative to other groups, a smaller proportion of African American applicants were being admitted. The department modified its approach by giving greater consideration to characteristics linked to doctoral completion and success such as research experience, scientific creativity, and persistence.

(5) An intensive month-long summer “boot camp” course, which serves roughly half of the incoming molecular biology doctoral students including 76% of incoming URM students. Participants report significant improvement in molecular techniques, software proficiency, time management, data interpretation, science writing, and oral presentation. The relationships developed during this course allow for strong mentoring relationships during the first few years of graduate school.

Figure 2:

Results from intensified recruiting of underrepresented minority (URM) applicants for MOL/QCB/NEU

