

Strategies for the Recruitment of Domestic Students into the PSM

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A major impetus for the development of the Professional Science Master's degree was the need for a targeted academic response to advancing the Nation's competitiveness and innovation, especially in areas based on science, technology and mathematics. In response, individual degree programs were created across the nation in partnership with appropriate corporations, industries, and government agencies to develop highly skilled science trained professionals. In the context of workforce enhancement and the recently announced National Science Foundation competition (funded through the American Recovery and Reinvestment Act of 2009), there is renewed interest in the recruitment and graduation of domestic students, including members of groups who are underrepresented.

Based on data from 84 current and former students in the University of Connecticut's two biology-based degrees (Applied Genomics and Microbial Systems Analysis), we report strategies

for the recruitment of domestic students. The UConn PSM student cohort in this study comprised 87% U.S. citizens or permanent residents, 71% women, and 6% members of under represented minorities. Our paper will focus on the domestic students. Those students accepted under standard admission criteria ($GPA \geq 3.0$) represent an academically talented group, with an average GPA of 3.51.

The pool of students for advanced training in science and mathematics in PSM programs may be even deeper than immediately apparent, if we consider the results of our pilot study of admissions of "GPA-challenged" applicants. From the beginning, we encountered applications from some students (often non-traditional ones) with GPAs below those required for regular admission status; such students had work experience, letters of reference, and personal statements that recommended them for advanced study. We initiated a pilot study to admit a small number of such students on a provisional basis each year and

evaluate their progress. Of the twelve such students admitted to date, seven have completed the program, including successful internships and employment; two of these have gained post-employment admission to PhD programs. Five are current students; of these, two have completed successful internships.

UConn PSM students come from a variety of undergraduate institutions, concentrated geographically in the Northeast. A majority of our students (53%) were graduates of the University of Connecticut; 7% of the Connecticut State University system; 22% of other regional colleges and universities, 13% of non-regional universities; and 4% of Historically Black Colleges and Universities. Public and private institutions of higher learning are about equally represented. Students admitted to the PSM degree programs are not interested in pursuing the doctorate, for a variety of personal and professional reasons. Regardless of the undergraduate institution or how the student initially learns about a PSM program, the majority of students will use the internet to gather information on the PSM programs, so a well-designed and informative web site is important.

Our experience demonstrates that a PSM program's home institution can be especially fertile grounds for recruitment of quality students. Resident programs are particularly attractive to those students who seek further training in preparation for entering the high technology workforce but do not want to move out of the region for either graduate school or employment. There are various routes by which upper-level UConn undergraduates arrive at the PSM programs in Applied Genomics or Microbial Systems Analysis. The most common way that students are recruited is through interactions with a professor, instructor, and/or academic advisor (59%). Students who have developed an interest in genomics or microbiology and wish to pursue

post-graduate education in one of those two areas will likely approach a professor for advice. Interestingly, faculty who make referrals to investigate the PSM are not only member of the programs' home department of Molecular and Cell Biology, but also of sister science departments such as Allied Health and Ecology and Evolutionary Biology. Our experience with students who apply to PSM programs in their undergraduate institution indicates a two-step process: students first learn about the program from some personal contact (enumerated in this and the following paragraphs) and then investigate details on websites.

The next most frequent way that UConn students learn of the PSM is through a current student or a graduate (15%). As the number of students in PSM programs increases, this type of recruitment will only grow, reinforcing the importance of having a satisfied cohort of current and former PSM students. A related route for recruitment is shared PSM classes, such as the short modular laboratory training offered through our PSM program. Excess seat capacity is offered to upper-level undergraduates who will learn of the PSM program from fellow students; some will subsequently apply to the programs. Flyers and course announcements are another way to make students aware of a PSM program (12%). We are also beginning to see referrals to the PSM programs from employers (7%), another trend that will increase as more employers become aware of the degree. In the past two years, PSM graduates have been among the invited speakers at the departmental "Career Day" which has also included a formal presentation on the PSM movement. Prior knowledge of our PSM programs by UConn undergraduates means that relatively few of them report initial exposure to PSM programs via generic web searches.

The biology PSM degrees have separate admissions within the larger framework of

departmental graduate admissions. Unlike the standard M.S. and Ph.D. admissions for fall semester that have fixed deadlines, PSM admissions are rolling with starts in both spring and fall. Strong collegial relationships and communication between admission committees within the department, as well as similar relationships outside of the department, provide opportunities for the re-direction of applicants to the PSM programs. This route has influenced the matriculation of both UConn graduates (7%) and graduates of other institutions (11%). Students who have applied and been accepted to traditional Master's programs in genetics or microbiology with personal statements and career aspirations better suited to the PSM may be redirected. The hybrid PSM programs are often better matches to the science student who has realized he/she is not properly prepared to enter the scientific workforce and would benefit from the specialized training and internship opportunities offered by the PSM. Students who do not specifically select the PSM field of study may well not be aware of that option. One strategy we have adopted is to send a letter that explains all three genetics and microbiology M.S. options (PSM, thesis, coursework) to both interested and accepted students so they may make informed choices.

What were the most effective methods of promoting awareness of our PSM programs to the 47% of our students who were not UConn graduates? As might be expected, internet searches and website information became more important, but surprisingly, personal contact with individuals with direct knowledge of the PSM degree remained a significant factor in promoting the programs and recruiting applicants. For those students who matriculated from national universities, internet searches and website information was the most effective recruitment tool (70%). However, even some graduates from geographically distant institutions were influenced by a prior awareness of PSM programs at their

home institutions (20%) or by direct recruitment by someone from UConn (10%). For graduates of regional colleges and universities, most students (60%) applied to our PSM programs as a result of internet searches and website information. A significant portion (40%) applied as the result of a direct interaction with a PSM student or an employer or faculty member who was aware of the UConn programs. Students recruited within state from the Connecticut State University System were influenced in equal numbers by personal recruitment from UConn PSM students or faculty, and advice from faculty or staff at their home institutions. Efforts have been ongoing to forge productive partnerships around PSM initiatives between the Connecticut State University System and UConn. Of the 16 local colleges and universities whose graduates are represented in our current and former PSM student cohorts, 15 have either hosted presentations on the PSM or are recipients of annual mailings of PSM posters and flyers targeted to relevant departments.

Like many programs, the UConn PSM places an emphasis on the recruitment of students from groups that are underrepresented in science graduate education. Although our numbers are small, all of our students of color have been recruited through initiatives launched in just the last 3 years. Marketing of the PSM program has been incorporated into four ongoing initiatives to increase the diversity of the University of Connecticut graduate student body. While the main thrust of the diversity initiatives are directed toward doctoral student recruitment, they provide an opportunity to publicize the PSM as well. In the annual *Summer Research Science Program*, about 35 underrepresented undergraduate students from across the country participate in a 10-week summer research program. As part of their experience, participants are informed about the PSM Program and interact directly with current PSM students. Two students from the

summer science program have enrolled in the PSM program at UConn. Each spring, about 40 underrepresented undergraduate students, identified as having the greatest potential for successfully completing a graduate program, participate in the *Spring Recruitment Weekend*. The participants learn about the PSM programs, interact with current PSM students and faculty, and are afforded the opportunity to apply on-site to the PSM program. In keeping with the findings that faculty play a key role in directing appropriate students to the PSM degree, efforts are being made to inform faculty who advise minority students of the opportunities afforded by the PSM initiatives at UConn and elsewhere. Each fall, 12 administrators and faculty members from minority serving institutions across the country participate in the *Visiting Professor Weekend*. While on campus they learn of our PSM programs and interact with the PSM program directors and students. Finally, PSM literature is included in *UConn recruitment events* at a number of conferences (Annual Biomedical Research Conference for Minority Students, Society for Advancement of Chicanos and Native Americans in Science, Louis Stokes Alliances for Minority Participation (LSAMP) Program, Ronald E. McNair National Conference, Historically Black Colleges and University – Undergraduate Program National Conference, and Institute for Learning and Mentoring (COMPACT) Conference).

Most PSM programs devote, appropriately, a good deal of effort toward reaching prospective students through websites and, more recently, social networks. However, as long as educators and advisors remain a prime source of information, direction and advice for undergraduate science majors on matters of graduate education, it remains equally important to promote their knowledge of the PSM degree. To greater or lesser degrees, the basis for most of our students' applications (63%) was exposure to

someone who has a prior awareness of the PSM degree. Students applying from distant undergraduate institutions are often graduates of universities with their own PSM programs, and are therefore aware of the national PSM movement and its associated web resources. A majority of local and regional students applying to and ultimately matriculating into our programs have learned of the PSM opportunity from someone they know: professors, current PSM students, graduates of the program, and employers. Therefore, an important component is the development of an informed and excited pool of faculty, graduate student coordinators, and advisors who can share information about the program with undergraduates. This requires coordinated communication about the program including anecdotes of academic and employment success among the PSM students and graduates, as well as publications highlighting these endeavors. The larger the number of enthusiastic proponents with awareness of a PSM program, the greater the likelihood of success in recruitment.

In our experience, educating teachers and advisors of prospective students about the PSM has an especially high return. As opposed to promoting programs directly to students who are transient, this effort creates an institutional awareness of the degree that has the potential to affect multiple generations of students. Alumni who are satisfied with their PSM experiences are also invaluable in advertising and recruiting. Employees who seek the PSM are highly likely to have employers or fellow employees who are knowledgeable about the degree program. As long as the PSM remains a relatively unknown degree, it is not surprising that the most effective approaches are direct interactions, which provide opportunities to better explain and explore the nuances of this new and innovative type of graduate education.