Bioengineering is a hybrid between the pure science of Biology and the applied science of Engineering. While the field has been established for over 30 years, it occupies a unique position within science reflected in our dual citizenship with College of Engineering and School of Medicine. The soul of Bioengineering is the exploration and alleviation of human suffering through science. Hence, student, faculty and departmental diversity are crucial to our success. We applaud the University’s commitment to diversity and welcome this opportunity to think critically about our own efforts.

Student access and opportunity

Over the past nine years the Department of Bioengineering at the University of Washington has initiated systematic efforts to increase the participation of women and under-represented minorities in bioengineering. Dr. Patrick Stayton, Professor, has been working on our bioengineering admissions committee and is helping to coordinate larger efforts in the School of Medicine.

Dr. Stayton and other Bioengineering faculty work closely with the College of Engineering's Minority Science and Engineering Program office. We have directly recruited together at targeted institutions with high numbers of talented under-represented minority students and have jointly recruited at national student conferences such as AISES (American Indian Science and Engineering Society) and SACNAS (Society for Advancement of Chicanos and Native Americans in Science). The MSEP office is now very familiar with our program and can effectively communicate opportunities in bioengineering to undergraduate students.

Developing a close working relationship with a few selected minority institutions with relatively high numbers of talented students is a very effective mechanism for increasing diversity. We have placed particular focus on Prairie View A&M, North Carolina A&T, Tougaloo and University of Texas – El Paso where we have ties to both faculty members and administrative leaders. Talented undergraduates are identified, brought to the UW for summer research experience and provided with a stipend and housing costs. In addition to research, the students are mentored and coached on presentation skills, written skills and graduate admissions. We feel that this individualized approach is more successful because it provides a richer experience.

Through the creation of the GAANN Fellowship Program in Bioengineering that Dr. Stayton has directed, the department has been able to leverage significant UW support for recruiting efforts and to strengthen relationships with the College of Engineering's diversity programs and personnel. Such recruiting efforts resulted in the admission of two particularly talented students. One of these students was honored as the 2002 Graduate Student of the Year by the National Society of Black Engineers National Executive Board and recognized by the 2002 Gold Torch Awards Selection Committee for his outstanding achievements and contributions. Before his successful defense in Summer 2003, this student was the graduate student representative on the UW Presidential Search Committee. Currently he is a post-doctoral fellow at the University of Cincinnati. The other student, successfully defended her dissertation in February 2002 and now is a Research Scientist at the Lincoln Laboratory of the Massachusetts Institute of Technology.

Our GAANN program is in collaboration with the Women in Science and Engineering (WiSE)
Program. We have jointly sponsored workshops addressing such topics as how to get into graduate school (for undergraduates), and how to succeed in graduate school (for first year graduate students). As part of the new GAANN program, we have worked with the WiSE directors, Dr. Suzanne Brainard and Ms. Meesha Grinter, to institute a new mentoring program for the GAANN fellows and for the undergraduate summer research students. WiSE has developed new curricular materials for successful mentoring that both provide instruction on how to effectively mentor for graduate student and faculty mentors, and instruction in how to be mentored for the undergraduate students. WiSE will be working with our new GAANN fellows to help them serve as better mentors to the undergraduates during the summer research program that they will be involved in, and at the summer GAANN workshop on diversity. WiSE will also provide mentoring to the summer research students participating in our UW Engineered Biomaterials Center REU as well as their ongoing involvement with the Center for Nanotechnology, of which Bioengineering is a participating department.

In addition to the efforts outlined above, the Department of Bioengineering participates in the National and Western Name Exchange. Approximately 100 informational letters were sent to students included on that list in November 2003. As part of our efforts to assist GO-MAP in assisting us, we are sending details to our 2004 recruits with information regarding, and encouragement for, their participation in GO-MAP’s Prospective Student Days. Luckily, our Recruitment Weekend falls on the same dates as the Prospective Student Days and we anticipate recruit and staff involvement between the two events.

Our Lead Academic Counselor, Kelli Jayn Nichols, created a job shadow program for aspiring bioengineers at the high school level to spend time in the lab of a Bioengineering faculty member. There has been a great deal of interest in this program. Ms. Nichols tracks these students to see how the experience has shaped their goals and, as appropriate, guides them toward UW Bioengineering.

Our Senior Academic Counselor, Jennifer Gouine, recently worked with her counterparts in the School of Medicine to create major promotional materials directed to underrepresented undergraduate students. Information is included about pursuing a Ph.D. versus an M.D., strengthening a graduate school application, and how the Pacific Northwest is a great place to live and do research. Jennifer will take these materials and a student with her to several conferences in 2004-2005 including those sponsored by the National Society of Black Engineers (NSBE), the Society of Hispanic Professional Engineers (SHPE), the Annual Biomedical Research Conference for Minority Students (ABRCMS), and SACNAS. Ms. Gouine is also a member of SafeZone, a UW program designed to visibly identify staff and faculty peers who support the gay, lesbian, bisexual, and transgendered (GBLT) population, understand some of the issues facing GBLT individuals, and are aware of the various GBLT resources.

Each year we appoint undergraduate and graduate admissions committees that reflect the varieties of our research as well as the diversity of our backgrounds. We recognize that the issue of diversity in admissions decision-making is restricted so we encourage the use of the ‘application statement’ as a means for potential B.S. and Ph.D. students to provide a fuller picture of their experiences inside and outside of the classroom and lab.
Student development and retention

Our efforts to retain minority and underrepresented students are best shown through two students that had difficulties at times throughout their tenure, and found themselves facing a quarter without funding. We believe in supporting our students toward graduation so we stepped in with funding to enable these bright students to complete their degrees. Subsequently, one student completed her Ph.D. in Winter 2000 and is a staff member of Rush-Presbyterian-St. Luke’s Medical Center in Chicago and an adjunct assistant professor of Bioengineering at the University of Illinois, Chicago. The other student completed his Ph.D. in November 2002 and works as an engineer in the Biomechanics division of Exponent Failure Analysis Associates in Philadelphia. Chimba and Ruth exemplify our commitment to the success of all of our students.

To ensure this success, we have created a standing Student Affairs Committee (SAC) that meets on a bimonthly basis to discuss policy, monitor student progress and act as last resort for “sticky” student issues. Faculty members are appointed for two-year terms, students (undergraduate and graduate) and post-docs are appointed for one-year terms with the option to extend their terms if they choose. All members are reminded of confidentiality obligations. We feel it is important for all students to have an audience to hear their issues but especially an audience with the authority to change policy or plead their case further when necessary.

Bioengineering provides full funding to doctoral students in the first year of graduate study, unless students arrive with their own support or are admitted directly to a professor’s lab. We feel it is important for our students to have three quarters in which to rotate between labs and find a good “fit”. Recruits and currently enrolled students have told us that this flexibility during the first year is a top selling point of our program. Each student is assigned a faculty member to guide him or her on issues of coursework, potential labs, the University, and the city in general. The Senior Academic Counselor and Vice-Chair are also available for practical and emotional support as we recognize that the transition from undergraduate to graduate status is an adjustment.

We maintain a strong relationship with our graduate students via the UW Bioengineering Student Association (BESA). In Spring 2001, BESA leaders polled the graduate students regarding their anonymous feelings toward the department, their relationship with their advisor and their committee members and solicited suggestions for improvement. The results were mixed and, since then, we have been working to research causes and collectively solve problems. We realize that such collectivity is an ongoing importance and not a mindset to abandon once problems have been solved. We bring this attitude to departmental diversity as well.

To evaluate our efforts at improvement, we conducted a follow-up survey in late Summer 2003. A high percentage of students responded and reported strong satisfaction with a) our Student Services team, b) diversity of and opportunity within research, and c) faculty advising. Areas in which we need to redouble our efforts are curriculum and teaching. Our Curriculum Committee and the Bioengineering faculty as a whole are strategizing with CIDR on the best path to improvement in these areas.
Finally, we hope to strengthen the connection between students, staff, and faculty when we move into our new building in Fall 2005. We anticipate an increased camaraderie between and within research groups as labs are moved from 11 separate buildings into a central location.

Engagement with the external community

We debuted two courses in Spring 2003 which we hope will address yield and pipeline issues: BIOEN 202, “Genomics, Human Life, and the Future of Society” and BIOEN 497, “Bioengineering Outreach”. BIOEN 202 is the department’s first general education course and we anticipate it will broaden the department to new students and give them an opportunity to discover bioengineering at an earlier stage in their studies. Currently undergraduate students apply to the department while taking requisite science courses and typically do not take departmental courses until admitted to the highly competitive major. BIOEN 497 is a combined undergraduate and graduate course that involves credit for team science- and math-based projects completed in local K-12 sites. The department has encouraged and assisted students with outreach projects for many years but this is the first course that organizes the projects and provides a weekly meeting for feedback, support and discussion.

One obstacle to our diversity success is the ‘pipeline’ issue. In addition to spotlighting diversity efforts in recruiting current graduate applicants, we need to focus science and engineering efforts in the secondary and undergraduate environments. The Department of Bioengineering’s University of Washington Engineered Biomaterials program (UWEB) has partnered with the School of Medicine’s BRIDGES4 program to accomplish this goal. Tyrone Porter mentored the research of two undergraduates, Adam Oliver (UW undergraduate in Bioengineering) and Matthew McCullough (a graduate of North Carolina A&T, now a University of Iowa graduate student in Bioengineering). In addition, UWEB and BRIDGES4 recently received approval on a joint grant to the National Science Foundation to increase the ability of undergraduate and community college students to enter the field of Bioengineering at the graduate level. Additionally, we actively participate in the College of Engineering’s annual Open House that brings thousands of local K-12 students to campus to partake in a wide variety of hands-on science and engineering activities. We have several science exhibits at this event but our Student Services team also staffs an educational booth to answer questions such as, “What classes should I take in 7th grade to prepare me to be a bioengineer?” We try to take every opportunity to make accessible the field of bioengineering as well as the Department of Bioengineering. Our job shadow program, described earlier, is another example of such effort.

Faculty, staff and administrative diversity

Our Core Faculty consist of six women and 23 men. This is a culturally diverse group who come from the US, Canada, China, Germany, India, Italy, Korea, and Spain. 41% of our Senior Fellows are female. The research and administrative staff are 56% female, and ethnicity is distributed among Pacific Islanders/Filipino (2), Native American (1), African American (3), Asian (16), Caucasian (56). In the past three years, we have hired three female faculty.
Climate

We strive to create an open and welcoming climate in Bioengineering and we recognize that our efforts have focused primarily on students. There is always more to do to recruit and retain a diverse student body, but we are most lacking in the recruitment and retention of a diverse department as a whole. Endeavors such as this Diversity Appraisal are appreciated and serve to help us appreciate where we must pinpoint our efforts.