Introduction: I am pleased for the opportunity to provide this strategic assessment of the Interdisciplinary Graduate Program in Genetics (henceforth, Genetics Program). The Genetics Program is a PhD-only program, which currently has 45 students and 57 faculty members participating from a wide cross-section of departments in 5 colleges. I was appointed Director in January of this year, and assumed the role of PI of the NIH T32 predoctoral training grant in August. We have made excellent progress in diversity and TTD, and will continue to focus on these issues and on mentorship.

Mission: The Genetics Program is a broadly based interdisciplinary program that incorporates cutting-edge techniques to answer the foremost questions facing biology, medicine, evolution and bioinformatics. The Genetics Program is designed to provide both a core curriculum in Genetics and sufficient flexibility to fit students’ individual needs. It provides research opportunities across the spectrum of Genetics, and fosters strong independent thinking to equip students to meet modern challenges of doctoral graduates. Within the Genetics Program is a Computational Genetics subtrack, for students who want to develop strength, both in the biological aspects of Genetics, and in computational approaches to analyzing large sets of genomic and genetic data. Students thus equipped have been extremely successful in filling a growing niche in contemporary science.

Admissions processes and criteria: The Genetics Program has conducted its own recruiting and admissions, as well as participating in the Biosciences entry program. Some students also affiliate with the Genetics Program through the Medical Scientist Training Program for a combined MD, PhD program. For admissions, we employ GPA and GRE scores as important criteria, but we balance these with analysis of transcripts for well-rounded academic preparation, as well as references letters and descriptions of research experiences. This approach is necessarily somewhat flexible for our aim of increasing diversity in our student group. We conduct on campus interviews for all students in the United States, and in years when the domestic applicant pool was shallow, we have conducted phone interviews for overseas applicants with the strongest applications. In recent years, we have coordinated with the Biosciences Program in joint interview visits, a feature that is supported by feedback from interviewees because it gives them a sense of belonging to a larger body of students on a similar path, while also maintaining the more intimate interactions of Genetics-only events during the interview weekends. Application numbers have steadily risen over the last 5 years up to 2008, from 11 to 18. In 2009, we had yet higher numbers, but it is not clear the extent to which this is explained by the extensive dual applications allowed inadvertently by the Biosciences mechanism. In any case, we compensated with a higher number of admits (16), and still not making offers to applicants that in previous years would have easily made admission. Of those admitted, 11 students enrolled for this fall. Importantly, 3 of those enrolled are URMs, bringing our URM enrollment to 4, representing almost 10% of our students. This is a solid foundation upon which we hope to build diversity.

Overall data for the Genetics Program ’96-’07 show that the applicant pool is highly competitive with other programs in the Biological/Biomedical Sciences group, and entering students have equal or slightly higher GPAs (3.47) than other programs in this group (3.45), and significantly higher than the average of all UI programs (3.36). This comparison is closely paralleled by GRE performance.

Regarding financial support, by agreement we set stipends annually at the same rate as the other Biological/Biomedical Sciences programs. Stipend support is guaranteed for the duration of the program, along with tuition support and mandatory fees. This support is typically provided by the Genetics Program for the first two semesters of the first year, during the three research rotations, using funds from the grad block, and supplemented as needed by the Genetics training grant, or in a few cases by scholarships. At the beginning of the subsequent summer, support becomes primarily the responsibility of the student’s faculty research mentor and is typically paid from grant funds to that faculty member. Other sources of support for students after affiliation with a research mentor include the Genetics training grant (6 slots per year, awarded competitively), individual scholarships or fellowships. Students are required to serve as teaching assistants for 2 semesters, but TAs are remunerated only in a minority of...
cases. Overall, students in the Genetics Program have been fully supported through one or more of these mechanisms.

**Program outcomes:** Completion statistics for Genetics Program students show a slightly improving trend from the forward-looking cohort analysis (students starting ’96-'01) compared with the backward-looking analysis (PhD completed ’03-'08). While there is some overlap in these two datasets, the earlier cohort has a completion rate of 57% and the latter has an apparent completion rate of 64%. These two figures are not calculated in exactly the same way; nevertheless, there does seem to be a trend for slightly higher completion rate. Compared to other programs, this is very close to average among the Biological/Biomedical Sciences group. Median TTD is 6.3 in the earlier cohort analysis, 6.1 in the later. This is admittedly one of the longer ones in this group, after correction for MD/PhDs. One possible contributing factor is that the Computation Track requires more extensive coursework to ensure dual strength. Nevertheless, this would only account for a small difference, and therefore TTD will be a focus area for improvement.

The Genetics Program students have been very competitive in fellowship awards. This is less apparent in data provided from the Graduate College, where among 3 Presidential Fellowship nominees in ’04-'08, only 1 was offered, and that one was declined. Only a single Dean’s Fellowship nominee was not offered the award. In the year since, we submitted one additional Presidential nominee, which was offered. Unfortunately, the nominee in the end declined. We also submitted 3 additional Dean’s nominations for URM students, two of which were offered and accepted. Our approach has been to nominate only very select individuals for these awards, with the knowledge that Graduate College funds were limited and other programs relied more heavily on these fellowships. This year, with several URM offers outstanding, the Dean’s fellowships became entirely appropriate. Beyond the Graduate College, our students have also been quite successful in external fellowship awards. Since 2004, 4 students were awarded NRSA fellowships (Dickson, Kaas, Halabi, Schultz) through the NIH. Also, American Heart Association fellowships were awarded to 4 students (Beyer, Schneider, Westin, Xu). Other fellowship awards include the Susan G Komen Fellowship received by two of our students (Norwood, Moss). This year we nominated a stellar candidate, Carmen Halabi, for the Spreistersbach Thesis prize (this award was given previously to Genetics student Daryl Scott in 1999).

While there are several desirable placement outcomes for our graduating students, academic or industry/government research and teaching positions rank very highly. More than 90% of our students initially moved into such positions. In the Biological/Biomedical Sciences, it is very difficult for doctoral graduates to go directly to tenure track faculty positions without several years of postdoctoral research experience. Thus, of our 49 doctoral graduates in ’98-'08, more than 80% went on initially to academic postdoctoral positions. Current placement data show that the majority have stayed in relevant positions, with a clear migration to tenure track faculty and college teaching positions, particularly in the older cohort. Our training program also prepares students well for positions in biotechnology and related industries and a few have established employment in this sector. Overall, we are very proud of the placement of our students and their enormous success speaks highly of the quality of the Genetics Program.

**Program characteristics:** The Genetics Program, like all Biological/Biomedical Sciences programs at UI, have the shared challenge of having a diverse student population. At least two contributing factors are that the population of the state of Iowa is not very diverse compared to some other regions of the country, and Biological/Biomedical Sciences have historically not been very well enrolled by diverse groups, in particular those that qualify as underrepresented minorities (URMs). Despite this we recognize that there is an institutional mandate, as well as a national mandate, to diversify. For example, continued funding for our NIH training grant specifically depends on our making progress in this area. To that end, we have become more aggressive at sending our faculty to conferences, such as SACNAS, HBCU, and ABRCAMS. For example, the Genetics Program sponsored Dr. Michael Anderson’s visit to HBCU last year, and played an important role in attracting a student from the University of the Virgin Islands (UVI) to join our program. This year, we recruited another student from the same institution, directed our way by one of the first student’s professors. We plan to nurture this relationship by sending a faculty member
to visit the UVI to help establish the Genetics Program and the University of Iowa as favorable
destination for students considering graduate programs. This relationship also allowed us to host a UVI
student in the summer undergraduate research program as well. This year, we also successfully recruited
two students from different campuses of the University of Puerto Rico. We hope that a similar approach
of nurturing relationships with these source institutions will help in our recruitment efforts. A very
difficult part of URM recruiting is attracting the first student to the program, then building upon the
nucleus of that student. We have now achieved a beginning, and we are very excited about the
possibilities that this opportunity presents us. The continuing challenges will be to continue the
momentum of recruiting, and importantly, to address retention. We have initiated specific oversight
procedures (student mentors, early monitoring of academic performance and if necessary, tutors) to aid in
this effort. Overall, we believe we are on the right track to make a significant different in diversity in our
program.

The program is already diverse in terms of disciplinary areas within the broad context of
Genetics, including basic biological mechanisms of gene action, understanding genetic and genomic bases
disease, molecular mechanisms of evolution, and bioinformatic approaches to understanding genomics,
populations, evolution and disease. This thematic diversity is a particular strength in our program. To
support breadth, our faculty must be, and are, equally diverse. One challenge presented by this diversity is
that defining what Genetics is, can be interesting, and naturally there are more cohesive subgroups within
the Genetics faculty than of the whole. Nevertheless, one of the defining features of the University of
Iowa, is a widespread recognition of the fact that our relative isolation in the midwest sometimes requires
an extra measure of acceptance of diverse approaches. I firmly believe this encourages interactions
among our faculty and our students that lead to novel collaborations impossible at other institutions.
Based on these considerations, a faculty of about 60, and a student population in the neighborhood of 45
is appropriate. I believe these levels must be sustained to maintain a vibrant and representative program.

A unique aspect of our program is our Computation Genetics subtrack. The goal of this subtrack
is to provide students with the curriculum and the research opportunities to develop strength BOTH in the
biological aspects of Genetics, but also in computational techniques and approaches that allow systematic
analyses of datasets in this area. We have a number of applicants that seek us out specifically for this
subtrack. While the number of enrolled students in this subtrack has not been large, this subtrack
addresses a particular niche, and those that have graduated through this subtrack have done
extraordinarily well upon graduation.

Another challenge for our program is again also an opportunity, in this case TTD. While we have
shown a slight recent trend in the right direction, we recognize that more is needed. To this end, my
personal mission through the Genetics Program is to more systematically point our faculty to mentoring
resources which will aid in more efficient training of our students toward independence. This will
improve not only the TTD, but also the quality of the end product. We are already paying more regular
attention to thesis meeting schedules and student evaluation as well. Overall, I believe that this is very
important and that we can make some progress in this area, despite some of the peculiar challenges
mentioned above.

Conclusions: The discussion and data presented here indicate that the Genetics Program is very strong,
is highly competitive with other programs in the Biological/Biomedical Sciences, which is among the
stronger groups of programs on campus. Particular strengths of the Genetics Program include
considerable recent success in recruiting URM students to the program (4 currently enrolled in the last
two years), continuing development of the Computational Genetics subtrack, and placement success for
our graduands. Continuing challenges will be retention of URM students, further recruitment for
diversity, and further reducing TTD, while maintaining or elevating high levels of achievement. To meet
these challenges, we have established more focussed monitoring of student progress, intensified
recruitment efforts in the midwest and at conferences and colleges that have been productive for URM
recruitment. Increased emphasis on mentoring, including mentoring of faculty and their approaches to
mentoring their students, will aid in achieving a balance between TTD and excellence. All of these
efforts will ensure a strong renewal application for the training grant, and create a more vibrant, efficient
and successful program.