INSTITUTE FOR PUBLIC HEALTH GENETICS, UNIVERSITY OF WASHINGTON

RESPONSE TO REVIEW COMMITTEE REPORT
PH.D. PROGRAM IN PUBLIC HEALTH GENETICS
FEBRUARY 13, 2009

The faculty, staff, and students of the Institute for Public Health Genetics would like to thank Dr. Sandra Bajjalieh and Dr. Kathleen Woodward, the internal review committee, Dr. Muin Khoury, the external reviewer, and the Graduate and Professional Student Senate (GPSS) for their thoughtful and thorough review of the Ph.D. program in Public Health Genetics. We are especially pleased that the committee has recommended that the program be given "continuing status" with the next review in 10 years.

As described in the self-study, we believe that the IPHG exemplifies core values expressed by the UW vision statement ("We foster creativity, challenge the boundaries of knowledge, and cultivate independence of mind through unique interdisciplinary partnerships") and by the School of Public Health ("Creativity and interdisciplinary approaches in solving local, national, and global public health problems"). We are grateful that the review committee recognized this by describing the Ph.D. program as "…an innovative interdisciplinary program that is the first of its kind in the world…this forward looking program has revealed itself to be exceptionally strong…an inspiring model for other interdisciplinary programs." The external reviewer from the CDC recognized the value of the Ph.D. program to the state of Washington, and to the nation by remarking that "Training in PHG is urgently needed…the UW program has superb and internationally known faculty…the quality of PHG training is remarkable…the students are strong and academically diverse."

We would like to respond briefly to each of the following recommendations and suggestions from the internal review committee, the external reviewer, and the GPSS. This document has been reviewed by Fred Connell, Associate Dean of the School of Public Health and Scott Davis, Chair of the Department of Epidemiology who concur with the responses.

Internal Review Committee Report

- *We urge strategic thought be given to the recruitment of students so as to maintain balanced class sizes of at least three doctoral students per year.*

We agree completely with this recommendation, and we are taking it into consideration during our admissions process this year. We also appreciate that the review committee recognizes the importance of the Ph.D. program as part of the overall IPHG graduate program. In particular, it is feasible to sustain the relatively small Ph.D. program because the interdisciplinary coursework and faculty involvement span all of the IPHG degree programs at the master's level as well as at the doctoral level.

- *Given the program's "first-in-the-world" nature and the potential for increased international visibility of UW, the committee recommends that the program increase the national and international scope of its students by recruiting from government and international agencies that have contact with potential students …. Given the international importance of public health genetics, coupled with the recent establishment of a Department of Global Health in the School of Public Health, we suggest that the program consider expanding its scope to include topics unique to global health issues. In addition, the program might consider expanding its mandate to include cross-species genetics in public health considerations, perhaps by adding ecologists to the participating faculty roster.*

Now that the IPHG is well established with 5 graduate degree programs and 11 years of experience, we agree that increasing international visibility should be a high priority. We plan to increase interactions with the new UW Department of Global Health (DGH). Dr. Steve Gloyd, Associate Chair of that department, has already given a presentation in the IPHG Interactive Seminar series. We will continue to build this relationship, especially as the DGH develops its graduate degree programs, including seeking adjunct appointments for IPHG faculty as appropriate.

Two graduate students, Jill Scott (concurrent JD/MPH graduate) and Kristin Beima (Ph.D. student) have already identified international agencies that will be valuable contacts. Specifically, Jill Scott completed an internship at the World Health Organization at the Internal Health Regulations Secretariat in Geneva, Switzerland, during the summer of 2008, and Kristin Beima has applied for an Overseas Fellowship in Global Health and Clinical Research as part of the NIH/Fogarty International Clinical Research Scholars Program. In addition, IPHG MPH students have traveled to South Africa, Estonia, and the Democratic Republic of Congo for practicum and thesis projects. Based on this recommendation from the review committee, the IPHG faculty will be more proactive on identifying additional global opportunities for students.

The IPHG faculty already has several ongoing international collaborations, and we will expand on these as another way to increase the international visibility of the program. For example, the Netherlands Institute for Health Sciences, an alliance of five leading Dutch universities and research institutes, recently announced the creation of a new, multidisciplinary research training program in Clinical and Public Health Genomics focused on translating genetic discoveries into health care. We are in close contact with Dr. Cecile Janssens, the coordinator of this program. In addition, several IPHG faculty members are involved with Genome Canada, a not-for-profit organization established in 2000 to develop and implement a national strategy for supporting large-scale genomics and proteomics research for the benefit of all Canadians. Building on this project, Drs. Austin and Burke met with representatives from the Public Health Agency of Canada, the University of Ottawa, and the University of British Columbia in October, 2008, to discuss a potential cross-border education collaboration in public health genomics.

The Public Health Agency of Canada has funding to support the development of an international network, GRAPH-Int (standing for Genome-based Research and Public Health International). This organization, chaired by Dr. Ron Zimmern of the Public Health Genomics Foundation, Cambridge UK, has the goal of facilitating connections internationally between students, researchers, clinicians and faculty interested in the application of genetics in public health. The initial effort of the network was to assume editorial leadership of Public Health Genomics (formerly Community Genetics), a journal published by Karger that is now dedicated to the public health applications of genetics with Drs. Bartha Knoppers and Angela Brand as co-editors-in-chief. Dr. Burke serves as a Scientific Editor of the journal, along with Dr. Khoury, and Drs. Burke and Veenstra served as guest editors of a forthcoming special issue of the journal devoted to pharmacogenomics and public health. GRAPH-Int is now turning its attention to connections between academic programs. In the coming year, the Public Health Agency of Canada will be building interactive web sites to facilitate student communication and sharing of curricula; IPHG students have been invited to participate in the development and piloting of this effort.

We agree with the committee that there is considerable merit in fostering closer interactions (and formal ties) between the existing IPHG graduate programs and regional biomedical investigators who have research interests in cross-species genetics. This area of research is an important theme in our didactic curriculum and some of the current IPHG faculty have incorporated cross-species genetics into their individual research program. For example, Dr. Tim Rose, IPHG core faculty member, is a long-time Research Affiliate of the Washington National Primate Research Center, which is

administered within the University of Washington. Dr. Rose's research is focused on developing animal models of human infectious disease, and is funded by the Primate Center to discover and characterize pathogens important for health and well-being of non-human primates. He is also funded to develop bioinformatic tools for gene discovery in non-human systems. His interest and expertise in comparative genetics is available to IPHG students through his graduate level class in Bioinformatics and Gene Sequence Analysis. Looking forward with the goal of enhancing this interaction, we will seek out UW/FHCRC/Seattle Children's faculty with specific interests in genetic research using model species for both biomedical and ecological applications. This can follow our established course of an invited seminar, interactions with IPHG faculty/students and possibly an Associated or Auxiliary faculty appointment if a connection is made.

- *We encourage the program to continue to explore mechanisms to engage advanced students in program activities. This is critical given the small interdisciplinary nature of the doctoral program and resultant scattering of the students after finishing their course work and preliminary exam.*

We agree that maintaining a sense of community among the advanced Ph.D. students is important for the program. Although such students are not currently required to attend the bi-weekly IPHG Interactive Seminar, we will strongly encourage them to participate in this seminar that includes students in all of the IPHG graduate programs. We also plan to continue the weekly IPHG journal club that was created by students to "foster community within the IPHG program and to promote the development of critical analytical and communication skills for students in all of the IPHG degree programs." A new student leader of the journal club has been identified, and a core faculty member will continue to assist in organizing and facilitating the sessions. Finally, we plan to continue the Ph.D. student seminar as a venue for all doctoral students in the program to share experiences and obtain guidance.

The follow three recommendations involve the UW Graduate School. We concur with all of the recommendations, and hope to work with the Graduate School in implementing them. We provide brief responses to each recommendation below.

- *The Graduate School could significantly support the program by helping participating faculty receive "credit" in promotion and merit considerations for their collaborative work associated with the program. Among other things, this could be facilitated by mandating that evaluations from interdisciplinary programs be included in faculty evaluations.*

During the 11 years since the inception of the IPHG, several core faculty members have been promoted in their respective academic departments and schools. In most cases, the IPHG director has contributed to the promotion process, but not in a formal way. We agree that a formal involvement with the promotion process would help insure that faculty receive the "credit" they deserve for their contributions to interdisciplinary programs.

- *The Graduate School should work with the leadership of the program to plan ahead for a transition of leadership, with the understanding that reorganization of the reporting structure may be required.*

The IPHG has benefited from strong support from the Department of Epidemiology and the Dean's Office in the SPH. If the leadership of these units changes, it could have a significant impact on the

IPHG. When such transitions are anticipated, we would convene a small committee of senior core faculty to work with the SPH leadership and insure the sustainability of the IPHG.

- *As the 2006 Graduate School report on "Seeding, Supporting, and Sustaining Interdisciplinary Initiatives" underscores, interdisciplinary programs are severely constrained by their inability in the normal course of things to propose faculty positions. We urge the Graduate School to work with deans, the directors of interdisciplinary programs, and department chairs to create a mechanism by which interdisciplinary programs can propose such positions. Doing so will allow the program an opportunity to address vacancies as they occur. We urge the Graduate School to work with the directors of interdisciplinary programs, department heads, and the Office of Research to address the relationship of the programs to research effort. One option would be to partition indirect costs based on the faculty in conducting that research.*

As described in the self-study, the state funding that supports the IPHG has been leveraged into several, large, extramurally funded grants to the core faculty. Because many of these projects would not have been possible without the IPHG infrastructure, we would welcome the possibility of changes to the current UW policies that would allow the IPHG to receive a portion of indirect costs from such projects. IPHG core faculty member, and Associate Vice Provost for Research, David Eaton has also indicated that the Office of Research has a near final Guidance Document for UW Centers and Institutes that makes similar recommendations, and explicitly encourages Deans to distribution a portion of the RCR back to interdisciplinary units that are responsible for, or contribute to, new interdisciplinary grants and contracts.

External Reviewer Report

- *Consider integrating these concepts into existing courses and curricula or even develop new ones whenever they are needed:*

  a. From interdisciplinarity to transdisciplinarity
  b. Increased emphasis on knowledge synthesis and integration
  c. Increased focus on genomic translation research
  d. Increased emphasis on statistical methods

a. Because of the active research programs of the IPHG core faculty, we are well aware of the increasing emphasis on multiple disciplines working together to solve the most urgent health challenges related to genomics. The dissertations of IPHG doctoral students that include research in each of the two core knowledge areas of public health genetics (A. Genomics in Public Health; and B. Implications of Genetics for Society) as well as the membership of dissertation supervisory committees from different disciplines, mirror this trend and demonstrate that graduate training in the IPHG at the UW is actually "ahead of the curve" in this regard.

   With regard to specific courses, survey course PHG 512 (Legal, Ethical and Social Issues in Public Health Genetics) provides students in both the Master's and Ph.D. programs with the opportunity to learn directly from experts in numerous disciplines. In addition, we actively seek to expand the focus of PHG courses to encompass additional disciplinary areas. For example, PHG 523 (Genetics and the Law) now includes consideration of agricultural genomics and the controversy surrounding genetically modified foods. In the coming year, genomics in the context of other species, notably in terms of species identification for purposes of endangered species designation, will also be a covered topic. The goal of these updates is to provide students with the intellectual tools to think and reason with a transdisciplinary perspective.

b. The IPHG coursework continues to evolve, and we appreciate the suggestion of incorporating more training in performing systematic reviews into the curriculum. We already have one new such course, PHG 551: Human Genomics: Science, Ethics, Society, that places recent advances in human molecular genetics and genomics in ethical and social context and focuses on population-based approaches to complex trait mapping and their impact on societal understandings of community, ancestry, and public health.

c. Khoury and colleagues have defined four stages of genomic translation, and have documented the paucity of research and scientific publications dedicated to the later stages, comprising the diffusion of healthcare innovation into mainstream practice and the measurement of public health outcomes (Khoury MJ et al. Genet Med 2007;9:665-74). IPHG core faculty are already identifying opportunities for work in this area. For example, work of the UW Center for Genomics and Healthcare Equality includes analysis of the translational pathway from the perspective of underserved populations. This work has generated student research projects and a book currently in preparation for Oxford Unviersity Press. Our work on translation focuses on the underyling societal milieu that stimulates research and the cycle that perpetuates development of tests and technologies that ultimately benefit the dominant population, rather than vulnerable and underserved populations.

   We are also identifying opportunities for adding curricular material related to translational genomics in several IPHG courses, including PHG 542 (Genetic Discovery in Medicine and Public Health). This, and other courses, already considers the issues of translation from research to benefit.

d. Beginning in the autumn of 2009, we plan to add an IPHG course offering in statistical genetics. Specifically, Dr. Timothy Thornton will join the Department of Biostatistics and will teach PHG 519, Statistical Methods in Genetic Epidemiology.

- *I also encourage the UW program to seek more training grants and establish stronger connections with faculty from other universities.*

As noted in the self-study, IPHG Ph.D. students have had funding through 6 different NIH training grants with faculty members affiliated with the IPHG. We will actively continue to seek out these training opportunities in many different UW departments. To date, however, interdisciplinary training grant opportunities directly related to IPHG have been limited, and we have discussed this with the IPHG Advisory Board. In the event, for example, that the Ethical, Legal and Social Implication (ELSI) program of the NHGRI begins to offer training grants, we will immediately submit an application. We will also re-explore the interest of the National Institute of General Medical Sciences (NIGMS) in a training grant that focuses on public health genetics, which might align with their evolving Pharmacogenomics Research Network. In the interim, we will continue to support the creation of new research centers (such as the existing CGHE) that indirectly provide training support for our doctoral and MPH students.

We appreciate the recommendation of strengthening ties with other universities. The University of Michigan School of Public Health offers an "interdepartmental concentration" in Public Health Genetics, and Dr. Sharon Kardia, the director of that program has visited the UW to give a talk in the IPHG Interactive Seminar series. Most recently, Karen Edwards, core IPHG faculty member and director of the UW Center for Genomics and Public Health, is working to develop a new Summer Institute in Public Health Genomics at the UW in collaboration with colleagues from the University of

Michigan, the CDC, and the NIH. As noted above, we are also developing international collaborations with universities who are developing graduate programs in public health genetics.

GPSS Report

- Concerns about knowledge of genetics: The lack of interaction between the PHG program and Genome Sciences program. More genetics classes, in particular more medical genetics courses.

We continue to identify ways in which to increase interactions between the IPHG program and the Department of Genome Sciences and the Division of Medical Genetics in the School of Medicine. Examples of this include the ongoing participation of Drs. Debbie Nickerson and Maynard Olson (Genome Sciences) on the Advisory Board, and the recent addition of Dr. Gail Jarvik (Medical Genetics) to the Board. Dr. Jarvik has recently funded an IPHG MPH student on a project in the Division of Medical Genetics. Dr. Malia Fullerton, IPHG core faculty member, has an adjunct appointment in Genome Sciences, creating an additional means of communication. We strongly encourage Ph.D. students to take Genome 565, Advanced Human Genetics, and this course can be used as a prerequisite for the preliminary examination. We are also currently working with the Department of Genome Sciences to co-list Dr. Fullerton's course PHG 551: Human Genomics: Science, Ethics, Society with Genome Sciences, with the goal of providing opportunities for IPHG students to interact directly with Genome Sciences students. Dr. Austin recently agreed to serve on the advisory committee for a NSF proposal led by Dr. Joshua Akey in the Department of Genome Sciences entitled "Exploring Databases: STEM learning and authentic research in high school classroom."

- Concerns about small cohorts and course cancellations: *Many core courses are required for Ph.D. students in the program, but an incoming cohort in a particular year may not be large enough to meet the minimum student requirement for the course to be held. Having a very small cohort can feel isolating, and makes it more difficult to study for the Prelim Exam.*

As noted in the response to the first recommendation from the Internal Review Committee above, we plan to enroll at least 3 Ph.D. students into the program each year. This, along with sustaining enrollment of 6-10 new MPH students per year will reduce the possibility of course cancellations due to low course enrollment.

- *Core course progression: it is not necessarily clear which courses are required, which are recommended.*

This concern was raised in the student-faculty feedback session on the Ph.D. curriculum held in June, 2008. As a result of the suggestions from students, major improvements to the IPHG website have been implemented. These changes include: 1) improvement in the overall clarity and consistency of the content in the Ph.D. overview section as well as in the Ph.D. degree guidelines documents; 2) improved navigation of the website and uniform formatting of all pages on the site; 3) changed several PHG course website links to include updated course websites and syllabus content.

- *Struggle of breadth vs. depth: core competency in the 6 different components of the program (genetics, etc.) makes it difficult to become expert in any one component. Two years of core coursework required for the Prelim. Exam makes it hard to take further courses to extend knowledge in any of the program's component areas.*

Balancing breadth and depth in the IPHG curriculum has been an ongoing challenge since the inception of this interdisciplinary program, and this has been a topic of many hours of discussion among the faculty. We believe that the current structure, allowing students to focus and extend their knowledge in areas related to the dissertation, after passing the preliminary examination, provides an innovative way to meet the goals of the program. We are especially pleased that the average time to degree for the Ph.D. is less than 4 years, even with the rigorous requirements of the program.

- *Funding: Students wished there were more funding opportunities through TA and RAships.*

As noted above in response to the External Reviewer report, the IPHG faculty and staff are always seeking funding for students on both training grants and research grants at the UW. We will continue these efforts, and will apply to interdisciplinary training grants whenever such opportunities are available.