

**INSTITUTE FOR PUBLIC HEALTH GENETICS, UNIVERSITY OF WASHINGTON**

**ANNUAL PROGRESS REPORT  
SUMMER, 2007**

**TABLE OF CONTENTS**

<b>I. Overview and Highlights</b>	<b>2</b>
<b>II. Program Administration and Governance</b>	<b>3</b>
<b>III. Academic Program</b>	
<i>A. Master of Public Health (MPH) in Public Health Genetics</i>	<b>5</b>
<i>B. Graduate Certificate Program</i>	<b>9</b>
<i>C. Ph.D. Program in Public Health Genetics</i>	<b>9</b>
<i>D. M.S. Degree in Genetic Epidemiology</i>	<b>15</b>
<i>E. Student Feedback</i>	<b>16</b>
<i>F. Evaluation of the Teaching Program</i>	<b>16</b>
<b>IV. Research Program</b>	
<i>A. Northwest Center for Genomics and Public Health (NWCGP)</i>	<b>20</b>
<i>B. ELSI Core of the Center for Ecogenetics and Environmental Health (CEEH)</i>	<b>20</b>
<i>C. UW Center for Genomics &amp; Healthcare Equality (CGHE)</i>	<b>21</b>
<b>V. IPHG 10th Anniversary Symposium</b>	<b>21</b>

## I. Overview and Highlights

Public health genetics continues to be an emerging, interdisciplinary field that applies advances in human genetics and genome sciences to improve public health and prevent disease. The mission of the University of Washington (UW) Institute for Public Health Genetics (IPHG) is to provide broad training for future public health genetics professionals, to facilitate research in this interdisciplinary field, and to serve as a resource for continuing professional education. Sixteen core faculty members from seven different schools and colleges at the UW are actively involved in the IPHG. In addition, strong collaborative relationships continue with the Washington State Department of Health and the Fred Hutchinson Cancer Research Center (FHCRC).

The 2006-2007 academic year was a landmark year for the Ph.D. program in Public Health Genetics at the UW, the only such degree program in the country. The first two students graduated from the program, both of whom completed highly interdisciplinary dissertation projects. One of these students is currently employed at the National Human Genome Research Institute at NIH and the other is undertaking a postdoctoral fellowship at the FHCRC. Eight additional doctoral students were advanced to candidacy during the academic year, and they are all making good progress on their dissertation projects.

The IPHG continues to offer the only accredited Master of Public Health (MPH) degree in Public Health Genetics, and a total of 42 students will have graduated from this program through Autumn Quarter of 2007. More than half of these graduates have entered advanced degree programs, including law school, medical school, and genetic counseling programs, while others are working in public health or research settings. During this academic year, the recently approved concurrent JD/MPH degree was implemented, with two students participating in this program. The IPHG Graduate Certificate Program continues to attract students from many different disciplines. A total of 33 students from 10 different departments have entered the program to date. In Autumn Quarter of 2007, 3 new students will begin the M.S. degree program in Genetic Epidemiology.

During the autumn of 2007, the UW IPHG will celebrate its 10<sup>th</sup> anniversary. This important milestone will be acknowledged by an afternoon symposium on October 31, 2007. The symposium will include a student poster session and presentations by leaders in the field, including Dr. Gilbert Omenn from the University of Michigan and Dr. Muin Khoury from the National Office of Public Health Genomics at the Centers for Disease Control and Prevention.

As illustrated by the publication of the first book on Public Health Genetics by our colleagues in the Public Health Genetics Unit at the University of Cambridge (Genetics, Health Care and Public Policy by Stewart, Brice, Burton, Pharaoh, Sanderson and Zimmern, Cambridge University Press, 2007), Public Health Genetics is a growing field. The UW IPHG continues as the national leader by providing excellence in graduate training, by developing interdisciplinary research programs, and by contributing to regional and national policy development.

## **II. Program Administration and Governance**

The IPHG is administratively housed in the Department of Epidemiology within the School of Public Health and Community Medicine (SPHCM), although it maintains its own budget and staff. Dr. Melissa Austin (Epidemiology) serves as the Director of the IPHG, and Dr. Ken Thummel (Pharmaceutics) is the Deputy Director. There are two staff members: Kevin Schuda, IPHG Manager, and Barbara Snyder, Student Services Advisor, as well as a part-time Student Assistant.

The IPHG website provides an essential resource for applicants, students, and faculty, and is continually updated as needed. The new, more informative and attractive brochure that was created last year to improve recruitment of students and to provide a more comprehensive description of the institute, was also updated this year. Unique aspects of the brochure are illustrations of student research projects and quotes from students about their experiences in the IPHG.

The IPHG previously submitted a diversity plan to the Graduate Opportunity and Minority Achievement Program (GO-MAP) in the Graduate School. By taking this action, incoming IPHG graduate students are eligible for GO-MAP diversity research assistantships. An incoming MPH student, Brittany Guy, was supported this year by such a research assistantship.

### Academic Program Committee (APC)

IPHG core faculty members serve on the APC, the committee that oversees all academic aspects of the institute. Dr. Austin chairs this committee. Meeting topics include curriculum matters, student admissions for the MPH and Ph.D. programs, student advising and mentoring, reviewing MPH thesis topics, writing and grading the Ph.D. preliminary exam, and facilitating student feedback.

Current members of the APC are listed in the table below. This year, two IPHG core faculty members were promoted: Dr. Kelly Fryer-Edwards was promoted to Associate Professor in the Department of Medical History and Ethics, and Dr. Tim Rose was promoted to Professor in the Department of Pathobiology. In addition, Dr. Ken Thummel was appointed Chair of the Department of Pharmaceutics in the School of Pharmacy. Note that Dr. Deb Bowen has moved to Boston University to become the Chair of the Social and Behavioral Sciences Department in the School of Public Health. However, Dr. Bowen is also serving as a Clinical Professor in Health Services at the UW, and she will continue to mentor doctoral students in the program until they graduate. Further, Dr. Tim Rose remains committed to the IPHG graduate program, even with transitions that are taking place with the elimination of the Department of Pathobiology.

Monica Fujii, a second year MPH student, and Anne-Marie Laberge, a third year Ph.D. student, served as student representatives to the APC for the 2006-2007 academic year. Kristen Beima, a second year MPH student, and Anne-Marie Laberge, will serve as the student representatives to the APC for the 2007-2008 academic year.

### **Institute for Public Health Genetics Academic Program Committee (APC) Members**

<i>Name</i>	<i>Position</i>	<i>Department/Program</i>
Melissa A. Austin, Ph.D.	Professor/Director/Associate Dean	Epidemiology/IPHG/Graduate School
Deborah J. Bowen, Ph.D.	Professor and Chair / Clinical Professor	Social and Behavioral Sciences Department, Boston University School of Public Health / UW Department of Health Services
Wylie Burke, M.D., Ph.D.	Professor and Chair	Medical History and Ethics
Debra Lochner Doyle, MS, CGC	Genetic Services Coordinator/Affiliate Instructor	Washington State Dept. of Health/Epidemiology
David L. Eaton, Ph.D.	Professor/Director/Associate Vice Provost for Research	Environmental and Occupational Health Sciences/Center for Ecogenetics and Environmental Health/Office of the Provost
Karen L. Edwards, Ph.D.	Associate Professor/Director	Epidemiology/Northwest Center for Genomics and Public Health
Kelly Fryer-Edwards, Ph.D.	Associate Professor	Medical History and Ethics
Stephanie Malia Fullerton, Ph.D.	Assistant Professor	Medical History and Ethics/ Genome Sciences
Patricia C. Kuszler, M.D., JD	Professor	Law/Medical History and Ethics/Health Services
Anna C. Mastroianni, JD, MPH	Associate Professor	Law/Health Services
Barbara Burns McGrath, Ph.D.	Research Associate Professor	Nursing/Anthropology
Scott Ramsey, M.D., Ph.D.	Member/Professor	Public Health Sciences, FHCRC/Medicine
Timothy M. Rose, Ph.D.	Professor	Pathobiology
Kenneth E. Thummel, Ph.D.	Professor and Chair/Deputy Director	Pharmaceutics/IPHG
David Veenstra, PharmD, Ph.D.	Associate Professor	Pharmacy
Carolyn Watts, Ph.D.	Professor	Health Services

Each summer, the Director of the IPHG meets individually with each of the core faculty members. These meetings provide an opportunity to review and update each faculty member's contributions to the program, to plan for the coming year, to provide feedback to the Director, and to formalize the IPHG's commitment for salary support to the faculty member. Again this year, these meetings were very valuable in facilitating and improving the interdisciplinary components of the graduate program.

#### IPHG Faculty Members

In addition to core faculty members, the IPHG continually seeks to identify researchers and health professionals who are interested in public health genetics, and then offer them a way to affiliate with the institute. Accordingly, we have designated a category of IPHG faculty “faculty members” who may become involved in a variety of activities, including mentoring students, serving on thesis committees, providing practicum sites, giving an occasional guest lecture or seminar, and/or participating in outreach activities and conferences. At present there are more than 30 such IPHG faculty members from a variety of departments at the UW, from Children’s Hospital and Regional Medical Center, from the Washington State Department of Health, and from the FHCRC.

Internal Advisory Board (IAB)

The IAB for the IPHG consists of leaders in the schools and departments involved with the institute. The chair position on this board rotates, and the current chair is Patricia Wahl, Dean of the SPHCM. This year, three new members of the IAB were added: Dr. Benjamin S. Wilfond, Director of the Treuman Katz Center for Pediatric Bioethics at Children’s Hospital and Regional Medical Center; Dr. Gail Jarvik, Professor and Head of the Division of Medical Genetics in the UW School of Medicine; and Dr. Debbie Nickerson, Professor of Genome Sciences.

**III. Academic Program**

***A. Master of Public Health (MPH) in Public Health Genetics***

Enrollment

The UW continues to offer the only accredited MPH in Public Health Genetics in the U.S. As shown below, there are a total of 62 MPH students who have or will soon enter the program. During the 2006-2007 academic year, the first two students enrolled in the recently approved concurrent JD/MPH program, allowing completion of both degrees in four years instead of five. In the Autumn Quarter of 2007, 5 new MPH students will begin the program (22 applications were received this year and 9 applicants were offered admission). The MPH students bring a variety of experiences and backgrounds to the program. Although many of them have undergraduate degrees in biology, biochemistry, genetics or molecular biology, others have backgrounds ranging from nursing and medicine to law and philosophy.

**Number of Students Entering the MPH Program by Academic Year**

<i>Academic Year</i>	<i>1998</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>Total</i>
	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	
Number of entering MPH students	3	5	7	6	11	7	5	3	10	5	62

MPH Practicum

The SPHCM requires a practicum experience for all MPH degree tracks. At the IPHG, this effort continues to be co-coordinated by Debra Lochner Doyle, APC member and the Genetics Services Coordinator for the Washington State Department of Health, and Carolyn Watts, APC member from the Department of Health Services. As listed below, 3 MPH students presented

their practicum work as posters during the Annual SPHCM Master of Public Health Practicum Reception and Career Fair in May, 2007. This well-attended event creates important bridges between the UW SPHCM and public health practice agencies.

### **MPH Practicum Posters, 2006-2007 Academic Year**

<i>Name</i>	<i>Poster Title</i>
Jill Brunner	Public Health Law Bench Book for Alaska Courts
Monica Fujii	Invasive Aspergillosis in Ambulatory Hematologic Transplant Patients during Construction
Megan Grembowski	Course on International Research Ethics, Law, and Policy

### Master's Thesis

IPHG MPH students must complete a research master's thesis project as the final component of their training. Through the end of Autumn Quarter 2007, 42 students will have completed the thesis requirement and will have graduated. The thesis topics listed below for graduates during 2006-2007 clearly demonstrate the interdisciplinary nature of IPHG training, as well as the diversity of academic interests among the MPH students.

### **Thesis Topics of MPH Graduates, 2006-2007**

<i>Name</i>	<i>Quarter</i>	<i>Year</i>	<i>Thesis Title</i>
Courtney McElroy	Fall	2006	An Assessment of Public Health Genetics in Action: The Estonian Genome Project from August 2002 to August 2003
Monica Fujii	Autumn	2007	Phenotypic versus Genotypic Testing for Personalized Medicine: A Policy Analysis using CYP2D6 and Tamoxifen as a Case Study
Megan Grembowski	Autumn	2007	State Regulation of Direct-to-Consumer Genetic Tests: A Survey of Genetic Policymakers
Catharine Riley	Autumn	2007	Public Health Follow-up of Abnormal Newborn Screening Results
Kimberly Friese	Autumn	2007	Radio-Frequency Identification (RFID) Technologies as Mass Disaster Identification Tools: The Public Health Need for the Efficient Return of Human Remains Post-Disaster

### Graduates

The IPHG continues to track the alumni of the MPH program including the professional positions they currently occupy. As listed below, 42 students will complete the program through Autumn Quarter, 2007.

### **Number of Students Graduated from the MPH Program by Year**

<i>Year</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>Total</i>
Number of MPH Graduates	1	1	3	7	5	5	11	4	5	42

In general, more than half of IPHG MPH graduates have undertaken more advanced training in a variety of disciplines, while the remainder work in either state or local health departments or in research settings. This is illustrated below for the 2005-2007 graduates. Since the beginning of

the program, four MPH graduates have gone on to Law School, three at the UW and one at Harvard. Two of these graduates are working in Seattle law firms. Three students have completed M.S. degrees in genetic counseling, and are currently practicing in that area. Two students have gone on to medical school and two others are pursuing nursing degrees. A total of 10 students have gone on to Ph.D. programs, 7 in the UW IPHG program, and one each in Science Education (UW), Public Policy (Johns Hopkins), Sociology (UC San Francisco). At the present time, four MPH graduates are working in either Washington or Oregon State Health Departments, and seven are working in research related positions. One graduate is a staff member at the National Human Genome Research Institute at NIH, and another is an Epidemiologist at Amgen Inc. in Seattle.

**Institute for Public Health Genetics MPH Alumni, 2005-2007**

<i>Name (Graduation Year)</i>	<i>Position and Organization</i>
Joon-Ho Yu (2005)	Ph.D. student, Institute for Public Health Genetics, UW
Kate Nickel (2005)	Research Coordinator, Alzheimer's Disease Research Center, Veteran's Affairs Puget Sound Health Care System, University of Washington, Seattle, WA
Kayleen Williams (2005)	Clinical Operations Manager, Multi-Ethnic Study of Atherosclerosis and Air Pollution, Collaborative Health Study Coordinating Center, Department of Biostatistics, UW
Anthony Crest (2005)	Medical student, New York Medical College
Alyssa DiGiacomo (2005)	Research Manager, MS Rehabilitation Research & Training Center, Department of Rehabilitation Medicine, UW
Matthew Gordon (2005)	Law student, Harvard University
Amy Hoffman (2005)	Project Director, Department of Rehabilitation Medicine, UW; Current: Clinical Research Associate, Cystic Fibrosis Therapeutics Development Network Coordinating Center, Children's Hospital and Medical Center, Seattle, WA
Anne-Marie Laberge, MD (2005)	Ph.D. student, Institute for Public Health Genetics, UW
Kerri Petrin (2005)	Research Analyst, Puget Sound Health Alliance, Seattle, WA
Jennifer Wroblewski (2005)	Speakers' Bureau Project Coordinator, Northwest Association for Biomedical Research
Karynsa (Hinton) Cetin (2005)	Senior Associate Epidemiology, Global Epidemiology, Amgen, Inc., Seattle, WA

Marvalyn DeCambre, MD (2006)	Physician, Pediatric Urology, Rady Children's Hospital, San Diego, California
Cheryl Berg (2006)	Clinical Research Coordinator, Digestive Disease Institute, Virginia Mason Medical Center, Seattle, WA
Elizabeth Rodgers (2006)	BSN student, School of Nursing, UW
Cheedy Jaja, Ph.D. (2006)	Graduate Student, Nurse Practitioner Program, School of Nursing, UW
Courtney McElroy (2006)	Medical Student, University of Minnesota, Minneapolis, MN
Catharine Riley (2007)	Will graduate Autumn Quarter, 2007 Ph.D. student, Institute for Public Health Genetics, UW
Megan Grembowski (2007)	Will graduate Autumn Quarter, 2007 JD, University of Washington, 2006 Associate, Bennett, Bigelow & Leedom, P.S., Seattle WA
Monica Fujii (2007)	Will graduate Autumn Quarter, 2007
Kimberly Friese (2007)	Will graduate Autumn Quarter, 2007

## ***B. Graduate Certificate Program***

The Graduate Certificate Program in Public Health Genetics is designed for students currently enrolled in another graduate degree program at the UW who wish to learn about public health genetics. Certificate students are required to take 12 to 18 units of IPHG courses, including 3 core courses and 3 quarters of the interactive seminar. Upon completion of these requirements, students receive a paper certificate and an acknowledgment of this training on their UW transcript. As shown below, a total of 33 students from 10 different departments have been accepted into the certificate program, and 26 have completed the requirements to date.

### **Number of Public Health Genetics Graduate Certificate Students by Home Department**

<b><i>Department or School</i></b>	<b><i>Number of Certificate Students</i></b>		
	<b><i>Completed</i></b>	<b><i>In Progress</i></b>	<b><i>Total</i></b>
Biomedical and Health Informatics		1	1
Environmental and Occupational Health Sciences	3	1	4
Epidemiology	11	3	14
Health Services	2	1	3
Nursing		1	1
Nutritional Sciences	6		6
Pharmacy	1		1
Public Affairs	1		1
Genomic Sciences	1		1
Law	1		1
<b><i>Total</i></b>	<b><i>26</i></b>	<b><i>7</i></b>	<b><i>33</i></b>

## ***C. Ph.D. Program in Public Health Genetics***

The 2006-2007 academic year was a landmark year for the Ph.D. program in Public Health Genetics with its first two graduates and eight students advanced to candidacy. The overall goals of this program are: 1) To train researchers, educators, and program administrators for careers in academic institutions, health care delivery systems, public health departments, government agencies and the private sector; 2) To provide interdisciplinary education so that graduates can address scientific and policy questions from a variety of perspectives.

### **Enrollment**

As shown below, there have been a total of 16 students who have enrolled in the Ph.D. program since it began in 2003.

### **Number of Students Entering the IPHG Ph.D. Program by Academic Year**

<b><i>Academic Year</i></b>	<b><i>2003-2004</i></b>	<b><i>2004-2005</i></b>	<b><i>2005-2006</i></b>	<b><i>2006-2007</i></b>	<b><i>Total</i></b>
Number of entering Ph.D. students	6	6	2	2	16

### Coursework

In addition to the “Fundamental Areas of Study” (Human Genetics and Public Health), the Ph.D. program covers two broad “Core Knowledge Areas”: 1) Genomics in Public Health or “Area A” (Genetic Epidemiology, Ecogenetics and Pharmacogenetics); and 2) Implications of Genomics for Society or “Area B” (Ethics & Social Science, Law & Policy, Health Economics & Outcomes Research). Area A includes the core courses entitled “Genetic Epidemiology”, “Introduction to Pharmacogenetics and Toxicogenomics”, and “Genetic Discovery in Medicine and Public Health”. Area B includes the core courses entitled “Legal, Ethical, and Social Issues in Public Health Genetics”, “Culture, Society, and Genomics”, “Ethical Frameworks for Public Health Genetics”, “Genetics and the Law”, “Economic and Policy Issues in Genetic Technologies”, and “Social and Behavioral Methods in Public Health Research”.

### Preliminary Examination

The preliminary examination for the doctoral program is developed collaboratively by the IPHG core faculty during the Spring Quarter of each year. The exam is designed to be taken after students have completed the required core courses, usually at the end of the second year of study. The purpose of the exam is for students to demonstrate competency in each of the six components of the core knowledge areas (genetic epidemiology, ecogenetics & pharmacogenetics, ethics, social science, law, and policy and health economics) before initiating his/her dissertation project. The exam is comprehensive and integrative, and uses a case study approach with questions relating to each of the core knowledge areas. The exam is administered each June, and students have two opportunities to pass the exam. Each question of the exam is graded by a group of appropriate core faculty members. Of the possible 100 points, a total score of at least 70 points is required to pass the exam, regardless of how the points are distributed among the individual questions.

After passing the preliminary examination, the student consults with his/her PHG faculty advisor or other PHG faculty members to identify an appropriate dissertation project that meets the requirements of the program. The dissertation project for the Ph.D. is intended to be an original research endeavor that contributes new knowledge relevant to this developing field. Thus, the content of the dissertation is a defining element in the student’s course of study. With the assistance of the dissertation supervisory committee, each student must provide a written dissertation proposal that incorporates the two core knowledge areas described above (A and B), one primary and one secondary.

### General Examination

The general examination is normally taken after the dissertation proposal has been completed, and before data collection for the dissertation research has begun. The general examination, administered by the dissertation supervisory committee, deals primarily with the general topic of the student’s dissertation. It is designed to:

- a. Measure the student’s ability to analyze and synthesize information;
- b. Determine whether the student has sufficient depth and breadth of knowledge in the general areas of the topic of his/her dissertation to complete the project; and
- c. Evaluate whether the student has adequate knowledge of recent advances and important concepts relevant to the student’s research project.

The general examination consists of two parts--written and oral. The written general examination generally consists of question(s) from committee members, tailored to the student's individual dissertation topic, with 1-2 weeks allowed to complete the written part. The written portion is graded pass/fail and can be re-taken before the oral portion of the exam, at the discretion of the dissertation supervisory committee, if needed. The committee members may require additional course work to remedy deficiencies in any relevant area identified in the written portion of the exam. The oral portion of the general examination includes a presentation of the content of the written examination, and is scheduled after the written exam is submitted. After the general examination, the committee indicates on the warrant whether the student passed or failed. If the student passes, advancement to candidacy is then awarded at the beginning of the next quarter.

As listed below, four students are preparing for the preliminary and/or general examinations, including one student who passed the preliminary examination in June, 2007.

**Institute for Public Health Genetics Ph.D. Students Preparing for Examinations, 2006-2007**

<i>Name</i>	<i>Status</i>	<i>Co-Mentors</i>	<i>Funding, Research Assistantship (RA) and Teaching Assistant (TA) Positions</i>
Llilda Barata, MPH	Passed preliminary examination, June, 2007; preparing for general examination	D. Eaton (IPHG, Environmental and Occupational Health Sciences), K. Fryer-Edwards (IPHG and Medical History and Ethics)	RA, Center for Genomics and Healthcare Equality (W. Burke, Medical History and Ethics, PI)
Sarah Dodson, MPH	Preparing for preliminary examination	K. Edwards (IPHG, Epidemiology), K. Fryer-Edwards (IPHG, Medical History and Ethics)	RA, Center for Genomics and Public Health (K. Edwards, Epidemiology, PI); TA PHG 513 (2007)
Sierra Hansen	Preparing for preliminary examination	S. Fullerton (IPHG, Medical History and Ethics), S. Ramsey (IPHG, Medicine)	UW Multidisciplinary Predoctoral Research Training Program - a Roadmap Initiative from the N.I.H./National Center for Research Resources, P. Mitchell (Nursing) & S. Marshall (Medicine), Program Directors
Catharine Riley, MPH	Preparing for preliminary examination	A. Mastroianni (IPHG, Law), B. McGrath (IPHG, Nursing)	RA, Top Scholar, Graduate School Fund for Excellence and Innovation; TA PHG512 (2006)

During the 2006-2007 year, eight students were advanced to candidacy for the Ph.D. in Public Health Genetics by successfully completing both the preliminary examination and the general

examination. The dissertation titles, dissertation supervisory committee members, and funding sources for the eight students who have advanced to candidacy are listed below and demonstrate the interdisciplinary nature of the dissertation projects being undertaken, as well as the diversity of faculty from many different disciplines who are serving on these committees.

**Institute for Public Health Genetics Ph.D. Students Advanced to Candidacy, 2006-2007**

<i>Name</i>	<i>Dissertation Title</i>	<i>Dissertation Committee Members</i>	<i>Funding, Research Assistantship (RA) and Teaching Assistantship (TA) Positions</i>
Nora Henrikson, MPH	Ancillary Information Provided by Genetic Tests	S. Ramsey (Chair, IPHG and Medicine), W. Burke (IPHG and Medical History and Ethics), D. Bowen (IPHG and Health Services), T. Lumley (GSR, Biostatistics)	UW Multidisciplinary Predoctoral Research Training Program - a Roadmap Initiative from the N.I.H./National Center for Research Resources, P. Mitchell (Nursing) & S. Marshall (Medicine), Program Directors
John Thompson, MPH, MPA	Implications of the Choice of Methodologies for Cystic Fibrosis Newborn Screening	C. Watts (Chair, IPHG and Health Services), T. Rose (IPHG and Pathobiology), W. Burke (IPHG and Medical History and Ethics), L. Garrison (GSR, Pharmacy)	Newborn Screening Program, WA State Department of Health; TA for PHG 510 (2000 and 2001)
Josh Carlson, MPH	Epidermal Growth Factor Receptor (EGFR) Pharmacogenomics: An Economic and Policy Evaluation	D. Veenstra (Chair, IPHG and Pharmacy), S. Ramsey (IPHG and Medicine), B. Kopjar (GSR, Health Services), L. Garrison (Pharmacy)	RA, Department of Pharmacy; TA for PHG 512 (2003), PHG 537 (2004), PHG 513 (2004)
Julie Harris, MPH	Communicating Genetic Risk Information: Understanding the Role of Different Communication Channels on the Use of Genetic and Hereditary Health Information	D. Bowen (Chair, IPHG and Health Services), W. Burke (IPHG and Medical History and Ethics), K. Fryer-Edwards (IPHG and Medical History and Ethics), F. Lewis (GSR, School of Nursing)	Biobehavioral Cancer Prevention Training Grant (Donald Patrick, Health Services, PI); TA for PHG 523 (2006), PHG 511 (2007)

Brandon Pierce, MS	Searching for Genetic Factors that Influence Prostate Cancer Risk and Intellectual Property Implications for Future Clinical Applications	M. Austin (Chair, IPHG and Epidemiology), P. Kuszler (IPHG and Law), J. Stanford (Epidemiology), C. Carlson (Epidemiology), S. O'Connor (GSR, Law)	Cancer Epidemiology Training Grant (Emily White, Epidemiology, PI); TA PHG 511 (2005)
Grace Wang, MPH	Medical Care Transitions by Youth with Special Needs and Disabilities Aging into Adulthood	C. Watts (Chair, IPHG and Health Services), B. McGrath (IPHG and Nursing), D. Grembowski (Health Services), B. Dudgeon (GSR, Rehab. Medicine)	RA, Department of Rehabilitation Medicine; TA PHG 523 (2007)
Joon-Ho Yu, MPH	What are our AIMS? Public Health Genetics and the Practice of Ancestry Informative Markers	S. Fullerton (Chair, IPHG and Medical History and Ethics), K. Edwards (IPHG and Epidemiology), K. Fryer-Edwards (IPHG and Medical History and Ethics), J. Taylor (GSR, Anthropology)	RA, Center for Genomics and Healthcare Equality (W. Burke, Medical History and Ethics, PI); TA PHG 512 (2005), PHG 511 (2006)
Anne-Marie Laberge, MD, MPH	Clinical Use and Utility of Genetic Tests for Factor V Leiden and the Role of Clinical Practice Guidelines in Defining Standard of Care	W. Burke (Chair, IPHG and Medical History and Ethics), P. Kuszler (IPHG and Law), B. Psaty (Epidemiology and Medicine), H. Starks (Medical History & Ethics), T. Lumley (GSR, Biostatistics)	RA, Center for Genomics and Healthcare Equality (W. Burke, Medical History and Ethics, PI)

### Graduates

As illustrated by the dissertation titles below, the two Ph.D. graduates had both Core Knowledge Areas strongly represented in their work. To complete these ambitious projects, Ph.D. students are required to have an interdisciplinary dissertation supervisory committee, including two APC members, one with expertise in Area A and another with expertise in Area B. Dissertation supervisory committee members were from a variety of departments and disciplines and serve on these committees to provide appropriate expertise to the student's project. Information on the current employment positions of these graduates is also contained in the table below.

### Institute for Public Health Genetics Ph.D. Graduates, 2006 - 2007

<i>Name (Graduation Year)</i>	<i>Dissertation Title</i>	<i>Dissertation Committee Members</i>	<i>Current Position and Organization</i>
Erin Ramos, MPH, Ph.D. (Winter, 2006)	Public Health Genetics of Alzheimer's Disease: From the Identification of Genetic Risk Factors to Public Policies Surrounding Long-Term Care Insurance	K. Edwards (Chair, IPHG and Epidemiology), W. Kukull (Epidemiology), C. Watts (IPHG and Health Services), T. Montine (GSR, Pathology)	Epidemiologist, Population Genomics, National Human Genome Research Institute, Bethesda, MD
Megan Fesinmeyer, MPH, Ph.D. (Spring, 2007)	Pancreatic Cancer Risk and Prevention: Association with PPAR $\gamma$ Gene and Policy Analysis of Tobacco-Related Pancreatic Cancer	M. Austin (IPHG, Epidemiology, Chair), D. Nickerson (GSR, Genome Sciences), T. Brentnall (Medicine), M. Mandelson (Epidemiology), J. Stanford (Epidemiology), C. Watts (IPHG, Health Services)	Postdoctoral Research Associate, Translational Outcomes Research Group and Cancer Technology Assessment Group, Public Health Sciences, Fred Hutchinson Cancer Research Center, Seattle, WA

Two students initially admitted to the Ph.D. program completed an M.S. in Public Health Genetics during the Autumn Quarter, 2006, by fulfilling the course requirements and writing a capstone project. These projects were “Par for the Course: A Model Curriculum for Integrating Ethics Education into Basic Genetic Research Training and Practice” (Lori Miller), and “Knowledge and Attitudes about Genetic Testing for Cancer Risk Among Koreans in Washington” (Tatia Chay Woodward).

#### Student Support and Accomplishments

Students in the Ph.D. program are supported by a variety of funding sources, including the UW Multidisciplinary Predoctoral Research Training Program - a Roadmap Initiative from the N.I.H./National Center for Research Resources (P. Mitchell (Nursing) & S. Marshall (Medicine), Program Directors), the Biobehavioral Cancer Prevention Training Program (Donald Patrick, Health Services, PI); the Cancer Epidemiology Training Grant (Emily White, Epidemiology, PI), the Center for Genomics and Healthcare Equality (W. Burke, Medical History and Ethics, PI), Center for Genomics and Public Health (K. Edwards, Epidemiology, PI); Top Scholar Award research assistantship from the UW Graduate School Fund for Excellence and Innovation (GSFEI). One student works at the Newborn Screening Program for the Washington State Department of Health, while others hold a variety of RA positions at the UW.

As in previous years, several doctoral students presented their work at national and international meetings. These included:

- Anne-Marie Laberge, MD, MPH: Genetic Tools: An online resource to help primary care faculty integrate genetics into primary care training. Poster presentation, American Society of Human Genetics, October, 2006.

- Joon-Ho Yu, MPH: Ancestry Informative Markers (AIMs): Silencing the social critique of race in genetics. Oral presentation, Society for Social Studies of Science Annual Meeting, 2006.
- Grace Wang, MPH: Factors associated with need and use of genetic counseling: An analysis of the National Survey of Children with Special Health Care Needs. Poster presentation, American Public Health Association 134<sup>th</sup> Annual Meeting and Exposition, November, 2006.
- Catharine Riley, MPH: Thesis presentation: Follow-up of abnormal newborn screening results: A public health system perspective; A model for determining the budget impact of expanded newborn screening; Financing public health system improvement: How much did Turning Point states leverage to build state infrastructure? American Public Health Association 134<sup>th</sup> Annual Meeting and Exposition, November, 2006.
- Tatia Chay Woodward: Telephone survey of attitudes towards genetic testing for colorectal cancer among Korean Americans: Design, methods and linguistic considerations. American Public Health Association 134<sup>th</sup> Annual Meeting and Exposition, November, 2006.

#### ***D. M.S. Degree in Genetic Epidemiology***

Dr. Karen Edwards directs the M.S. degree program in Genetic Epidemiology (MSGE). Training in this program focuses on methods to identify genetic diseases and their interactions with environmental exposures in populations. It emphasizes applied research skills and is a collaborative effort between the IPHG, and the Departments of Epidemiology and Biostatistics in the SPHCM. Prospective students are expected to have an excellent academic record with a bachelor's degree and coursework in human genetics. The program is designed to be completed in two academic years. It includes basic courses in epidemiology and biostatistics, core courses in genetic epidemiology (PHG 511 taught by Melissa Austin and PHG 518 taught by Karen Edwards), a bioinformatics course (PHG 536/MEDED 536/PABIO 536 taught by Tim Rose), and an ELSI course (PHG512/Law H504/MHE 514 taught by Anna Mastroianni and Pat Kuszler), and the completion of a research-based thesis. The core faculty members of the MSGE program are shown in the table below.

#### **Core Faculty Members for the M.S. Degree in Genetic Epidemiology**

<i>Name</i>	<i>Position</i>	<i>Department/Program</i>
Karen L. Edwards, Ph.D., Director of M.S. program	Associate Professor/Director	Epidemiology/Northwest Center for Genomics and Public Health
Melissa A. Austin, Ph.D.	Professor/Director/Associate Dean	Epidemiology/IPHG/Graduate School
Steve M. Schwartz, Ph.D.	Professor/Member	Epidemiology/Public Health Sciences, Fred Hutchinson Cancer Research Center
Michael E. Rosenfeld, Ph.D.	Professor	Environmental Health/Pathology

Meg Ragland, a second year MSGE student will serve as the student representative during the 2006-2007 academic year.

The MSGE program began during the 2003-2004 academic year and 3 students have graduated to date. Two of these students now hold faculty positions in the UW School of Medicine, and the third is a research fellow. Another graduate, Dr. Carrie Heike, has received an NIH K-award, focusing on the genetic epidemiology of craniofacial features. Thus, graduates of this program are utilizing their training, and are already becoming established as independent investigators in their respective fields.

### ***E. Student Feedback***

The IPHG continues to seek feedback from students on a regular basis. Two students, one MPH and one Ph.D., attend APC meetings, and are encouraged to raise student issues at any meeting during the year. The annual IPHG student-faculty feedback session was held in April, followed by a pizza lunch. Comments from both Ph.D. students and master's degree students were discussed, after student groups had met earlier to identify discussion topics before this session.

### ***F. Evaluation of the Teaching Program***

#### Interactive Seminar

The IPHG seminar series, PHG 580, now in its 10<sup>th</sup> year, continues to feature a variety of speakers from different disciplines. These bi-weekly seminars provide an opportunity for students from all of the degree programs and the IPHG faculty from many parts of campus to discuss topics of mutual interest. They are designed to be highly interactive. A video library of the seminar sessions and other relevant tapes is maintained in the IPHG office. This year, the seminar was coordinated by Melissa Austin and Patricia Kuszler.

Three types of seminar were presented this year. First, every quarter at least one seminar is presented by one or more IPHG students. This year, these sessions included:

- Anne-Marie Laberge and John Thompson, IPHG Ph.D. students, presented highlights of the 4<sup>th</sup> International DNA Sampling Conference on Genomics and Public Health held in Montreal, Canada in June, 2006.
- Brandon Pierce, IPHG Ph.D. student, presented a seminar on “Intellectual Property Rights and Human Genetic Variation.”
- Students participated in the annual MPH Practicum Reception sponsored by the School of Public Health and Community Medicine, including three students who presented posters.

Second, the seminar features research projects being conducted by IPHG faculty, other local UW researchers, faculty from Children's Hospital and Regional Medical Center, and faculty from the FHCRC. This year, these sessions included:

- Patricia Kuszler, Professor of Law, presented the first seminar of the year on “Legal Parenthood: Genetic Non-Determination?”

- Benjamin S. Wilfond, Director of the Treuman Katz Center for Pediatric Bioethics at Children’s Hospital and Regional Medical Center presented a seminar on “Pediatric Biobanks.”
- Barbara Burns McGrath, IPHG core faculty members and Research Associate Professor in the School of Nursing, presented a seminar based on her participation in the Secretary’s Advisory Committee on Genetics, Health and Society, entitled, “Big Science: Creating a US. Biobank?”
- Scott Ramsey, IPHG core faculty member and full member at the Fred Hutchinson Cancer Research Center discussed his work on “Equal Opportunity Defective? Public Perceptions of Mutation and Polymorphisms and their Implications for Risk Evaluation.”
- Devon Pena, UW Professor of Anthropology, discussed “Environmental Justice in a Post Genomic World.”
- Wylie Burke, IPHG core faculty member and Chair of the UW Department of Medical History and Ethics, presented a seminar on “Evaluating Genetics Tests: The Problem of Clinical Utility.”
- Cindy Watts, IPHG core faculty member and Professor of Health Services discussed “Public Discourse about Genetics: Messages from the Print Media.”
- Whitney Neufeld-Kaiser, Genetic Counselor from UW Perinatal Genetics presented on “Screening for Fetal Anomalies from the Public Health Point of View.”

Finally, the seminar series included a variety of speakers from outside the UW who presented many different perspectives on public health genetics. These included:

- Ralph Forquera, Executive Director of the Seattle Indian Health Board presented a seminar on “The Struggle for Recognition: Urban Indian Health in the 21<sup>st</sup> Century.”
- Patricia Marshall, Professor Bioethics and Anthropology at Case Western Reserve University School of Medicine presented on “Ethical Challenges in International Genetic Research: Informed Consent and the Conundrum of Individual and Social Agency.”
- Kim Tallbear, Assistant Professor of American Indian Studies from Arizona State University described “Narrative of Race and Indigeneity in the Genographic Project.”

Each of these speakers also had informal lunch meetings with IPHG students, and individual discussions with IPHG faculty members.

During the next academic year, Melissa Austin will work with S. Malia Fullerton (Assistant Professor in Medical History and Ethics, Adjunct Assistant Professor in Genome Sciences) to coordinate the seminar. Dr. Fullerton brings a unique perspective of combined expertise in genomics and bioethics to the seminar, and she has already identified several potential seminar speakers, both from the UW and other institutions.

### Student Evaluations of Courses

All IPHG courses continue to be evaluated by students using the Instructional Assessment System of the Office of Educational Assessment. The average combined score for “the course as whole”, the “course content”, the “instructor’s contribution”, and the “instructor’s effectiveness”, based on a scale of 0 (very poor) to 5 (excellent), for each course is listed below. Again this year, IPHG courses continue to be highly rated by the students. In particular, two

courses were rated especially high (4.6 or above), including PHG 590A (4.8) taught by S. Malia Fullerton, and PHG 523 (4.7) taught by Pat Kuszler.

**Student Evaluations of IPHG Courses, 2006-2007 Academic Year**

<i>IPHG Course</i>	<i>Units</i>	<i>Quarter, Year</i>	<i>Combined Score*</i>
PHG 511/EPI 517: Genetic Epidemiology	3	Spring, 2007	3.7
PHG 512/LAW H504/MHE 514: Legal, Ethical and Social Issues in Public Health Genetics	3	Autumn, 2006	4.3
PHG 513/ENVH 513/PCEUT 513: Basic Concepts in Pharmacogenetics and Toxicogenomics	3	Winter, 2007	3.6
PHG 518/EPI 518: Computer Applications in Genetic Epidemiology	4 or 2	Spring, 2007	4.4
PHG 519/BIOSTAT 516/EPI 516: Statistical Methods in Genetic Epidemiology	3	Not Offered	N/A
PHG 521/ANTH 574/NURS 582: Culture, Society, and Genomics	3	Spring, 2007	4.3
PHG 522/MHE 516: Ethical Frameworks of Public Health Genetics	2	Not offered	N/A
PHG 523/LAW H520: Genetics and the Law	2	Winter, 2007	4.7
PHG 525: Public Commentary on Ethical Issues in Public Health Genetics	3	Spring, 2007	4.1
PHG 537/PHARM 436: Pharmacoeconomics, Genetics and Healthcare	2	Not offered	N/A
PHG 541: Economic and Policy Issues for Genetic Technologies and Services	3	Autumn, 2006	4.5
PHG 542/MHE 530: Genetic Discovery in Medicine and Public Health	3	Winter, 2007	4.4
PHG 543: Social and Behavioral Research Methods in Public Health Research	3	Not offered	N/A
PHG 580: Interactive Seminar	1	Spring, 2007	3.6
PHG 581: Introduction to Genetic Services and Bioinformatics	1	Winter, 2007	4.0
PHG 590: Human Genomics: Science, Ethics, Society	4	Spring, 2007	4.8
* Median Score ranging from 0 for “poor” to 5 for “excellent”			

Course Enrollment: As tabulated on the following page, demand for IPHG courses from students outside the program remains high. This year, IPHG courses were attended by students from 15 different departments within the UW, in addition to IPHG students. Thus, IPHG courses continue to be of broad interest across the campus.

**INSTITUTE FOR PUBLIC HEALTH GENETICS  
STUDENT COURSE ENROLLMENT, 2006-2007 ACADEMIC YEAR**

Course	IPHG, MPH, MS, PhD (Certificate*)	Epi	Env & Occ Health	Health Serv/ MHA	Nutrition	Pharmacy	Law	Misc. **	Non- Matric.	<b>Total</b>
<i>Autumn 2006</i>										
PHG 512	11 (3)	2					7	1	1	25
PHG 541	2							1		3
PHG 580	19 (3)	1				1		3		27
<i>Winter 2007</i>										
PHG 513	13 (2)	3				5			2	25
PHG 523	7						8	2		17
PHG 542	4							5	2	11
PHG 580	17 (2)	3		1				3		26
PHG 581	9 (1)							1		11
<i>Spring 2007</i>										
PHG 511	15 (2)	7							1	25
PHG 518	5 (1)	1							1	8
PHG 521	13 (1)			1				2		17
PHG 525	12							9		21
PHG 580	21 (3)	2								26
PHG 590	4							1	1	6

\* Certificate students: 1 from Biomedical & Health Informatics, 4 from Epidemiology, 1 from Health Services, 1 from Nursing

\*\*Includes: Biochemistry, Bioengineering, Biology, Biostatistics, Communications, General Studies, Genome Sciences, Health Administration, Molecular & Cellular Biology, Nursing, Philosophy, Policy Studies, Political Science

## **IV. Research Program**

### ***A. Northwest Center for Genomics and Public Health (NWCGP)***

The Northwest Center for Genomics and Public Health was established in 2001 at the UW as a hub of expertise in genomics and population health, with Dr. Karen Edwards serving as PI. The NWCGPH was one of three such centers originally funded by the Centers for Disease Control and Prevention (CDC), with the others located in Schools of Public Health at the University of Michigan and the University of North Carolina. Center activities have included (1) increasing the knowledge base in genomics and public health; (2) providing technical assistance to local, state and regional public health organizations; and (3) developing and providing genomics training materials.

In addition to Dr. Edwards, several IPHG faculty members are actively participating in the Center. Many IPHG students have been involved in the Center and several have completed their MPH practicum and/or thesis in affiliation with the Center.

### ***B. ELSI Core of the Center for Ecogenetics and Environmental Health (CEEH)***

Dr. David Eaton, an IPHG core faculty member, is the PI of the CEEH, funded by the National Institute of Environmental Health Sciences (NIEHS). The theme of this center is “Biochemical and Molecular Mechanisms Underlying Human Variability in Response to Environmental Exposures”, and the overall purpose is to provide an administrative infrastructure and technical support to foster the multidisciplinary collaborations necessary to extend basic mechanistic studies on environmental health problems to direct application in human populations. Within the center, the Ethical, Legal and Social Implications (ELSI) Core is directed by IPHG core faculty member Kelly Fryer-Edwards, and involves several other IPHG faculty members. In addition, IPHG graduate students participate in the projects undertaken by the ELSI Core. The goals of the ELSI Core are to:

- Facilitate the development of research projects to identify and study the ethical, legal, social and policy implications of scientific advances in ecogenetics and environmental genomics, especially in relation to high frequency, low penetrance genetic polymorphisms.
- Develop and implement education strategies and materials that address the ethical, legal, social and policy implications of ecogenetic research for several target audiences, including graduate students, CEEH Investigators and trainees, health professionals and community groups.
- Provide a service to other Center Investigators by maintaining the existing CEEH "Registry for the Study of Genetic and Environmental Risk Factors" and provide consultation to Center Investigators on ethical, legal and policy issues, including informed consent, for genetic studies involving human subjects.

During the 2006-2007 academic year, the ELSI Core focused on issues involving returning genetic results to research subjects, managing risk and uncertainty within several ecogenetic studies, and partnered with the Education and Outreach Core to develop publicly accessible materials inspired by CEEH projects. In the coming year, the ELSI Core will launch an ethics

brown bag discussion with CEEH investigators and staff, and will pursue grant funding to explore ethical issues in emerging genome-wide association studies.

### ***C. UW Center for Genomics & Healthcare Equality (CGHE)***

Dr. Wylie Burke (Medical History and Ethics) is principal investigator and Dr. Patricia Kuszler (School of Law), is co-principal investigator of this center. Both are IPHG core faculty members. The center is funded by the National Human Genome Research Institute (NHGRI) and the National Institute for Child Health and Human Development, and is one of four Centers of Excellence in Ethical, Legal, and Social Implications (ELSI) Research nationwide.

The Center is dedicated to addressing two overarching themes accompanying the clinical integration of genomics: the need to define criteria that lead to clinically and socially appropriate applications of genomic health care; and the need for a translational pathway that incorporates the goal of reducing health and health care disparities among the medically underserved. The specific aims of the Center are to:

1. Identify strategies for assessing the clinical utility of a range of different genomic applications to health care.
2. Assess the implications of different genomic health care applications for medically underserved populations.
3. Based on these efforts, describe policy options for the clinical integration of genomics into health care, and their implications for addressing health and health care disparities.
4. Engage ELSI researchers and genetic scientists in on-going conversations about the interacting contributions of the environment, social structural factors, and genetics to health outcomes.
5. Provide training opportunities to encourage the participation of researchers from underrepresented minorities in the Center's research agenda and other ELSI research.
6. Stimulate collaborative partnerships that result in additional funded research addressing these and related questions.

In addition to Drs. Burke and Kuszler, key personnel on the project include several other IPHG core faculty members: Deborah Bowen, David Eaton, Karen Edwards, Kelly Fryer-Edwards, Ken Thummel, David Veenstra, Carolyn Watts. Importantly, this Center also supports three pre-doctoral IPHG students.

## **V. IPHG 10th Anniversary Symposium**

During the autumn of 2007, the UW IPHG will celebrate its 10<sup>th</sup> anniversary. This important milestone will be acknowledged by an afternoon symposium on October 31, 2007, at the UW Waterfront Activities Center. Students, core and member faculty, advisory board members, and alumni will be invited. Following a buffet lunch, current students will present posters on their research and practicum projects, and a slide show of alumni will be shown. Dr. Gilbert Omenn, former Dean of the SPHCM and founder of the program, will present, along with Dr. Muin Khoury, Director of the National Office of Public Health Genomics at the CDC.