SECTION A: GENERAL SELF-EVALUATION

1. What are your unit's strengths? Units generally have a variety of roles and responsibilities within the institution (e.g., undergraduate, graduate, professional education; continuing education; outreach education; research, scholarly, or creative activity; service; consultation; self sustaining activities; patient care). Please describe what you do; focusing particularly on those things you do well. You may wish to include examples of long-term excellence as well as any recent accomplishments or improvements in your unit. In what ways is your unit a leader in your field?

The strengths of the Department of Genome Sciences (GS) include its faculty, their research programs and national and international leadership, the graduate program, our undergraduate curriculum and our outreach efforts. The Department was formed in September of 2001 through the fusion of the Department of Genetics (College of Arts and Sciences) and the Department of Molecular Biotechnology (MBT) (School of Medicine). The major research emphasis of the Department is in genomics, broadly defined as complete functional and structural characterization of whole genomes. The Department is currently chaired by **Dr. Robert Waterston** (William Gates III Endowed Chair in Biomedical Sciences, Chair and Professor) and consists of 48 training faculty; 26 of these faculty have primary or joint appointments in Genome Sciences, and the others are adjunct or affiliate faculty.

The merger of Genetics and MBT created a whole that is clearly greater than the sum of the parts. With the recruitment of **Robert Waterston** and six additional outstanding faculty (**Joshua Akey**, **Evan Eichler, Michael MacCoss**, **William Noble, John Stamatoyannopoulos** and **Willie Swanson**), and with **John Storey** establishing a lab in the Department (joint with Biostatistics), we have greatly strengthened an already outstanding Department and have begun to balance a distinguished senior faculty with superb creative and talented junior faculty. We have also expanded the training faculty by substantially increasing our Adjunct, Affiliate and Joint faculty (e.g., **Janis Abkowitz**, **David Baker**, **Anthony Blau**, **Peter Byers**, **Dan Gottschling**, **Marshall Horwitz**, **Harmit Malik**, **Sam Miller**, **Peter Nelson**, **Richard Palmiter**, **David Raible**, **Wendy Raskind**, **Larry Ruzzo**, **Elizabeth Thompson**, **Martin Tompa**, **Bruce Weir** and **Ellen Wijsmann**). With several additional faculty positions to be filled following the move into the new Foege building this fall, we will further expand our core faculty over the next several years.

Specific areas of research emphasis are computational biology, genomics and proteomics and related technology development, human genetics, and genetics in model organisms.

In addition to outstanding faculty, the Department has a thriving graduate program. We currently have 56 graduate students. Most of these students enter our program directly through our departmental program, although several labs also attract students through the multidisciplinary Molecular Cell Biology (MCB) program, the Medical Scientist Research Training (MSTP) program, and occasionally through the Bioengineering, Statistics, and Computer Science programs. We take seriously our responsibility to recruit a group of students diverse in race, ethnicity and gender. The success of our new Department is reflected in the size and quality of our incoming classes. Since the merger, our class sizes have ranged between 8-14. By objective criteria, these students are better qualified than ever with a gratifying diversity of undergraduate backgrounds. Many of the students have considerable strengths in mathematics, computer science and technology. These are just the types of student that we hoped to recruit when we formed the Department of Genome Sciences.

The Department is committed to the teaching mission and offers a wide range of graduate and undergraduate courses. Formal graduate education is organized around a series of six five-week core courses, supplemented with a variety of elective courses. Chief among the undergraduate courses is GS371 (Introductory Genetics), which is taken by over 500 students per year. This highly popular course is a requirement for all biology and biochemistry majors. A few years back, **Professors Bonny Brewer** and **Celeste Berg**, with the help of **Lecturer Anne Paul**, introduced a weekly lab session to complement the lectures. This rigorous and exciting course is generally oversubscribed. We recently implemented a faculty rotation for this course that involves many of our regular faculty. We also have many undergraduates working in our laboratories, thereby gaining invaluable experience at the bench.

We are proud of the numerous accomplishments of our faculty. Our chair, **Dr. Waterston**, has received significant recognition for his pivotal role in several efforts of the Human Genome Project. His awards include the Beadle Medal from the Genetics Society of America, the first annual Dan David Prize in 2002, the 2002

Gairdner and Alfred P. Sloan Awards, and the 2005 Genetics Prize from the Gruber Foundation. Two other GS faculty, **Drs. Maynard Olson** and **Phil Green**, also received the Gairdner Award for their critical contributions to the Human Genome Project. Eleven of our training faculty are members of the National Academy of Sciences, including 2001 Nobel Prize winner **Dr. Lee Hartwell**, who conducted much of his groundbreaking work in the Department of Genetics. Six training faculty are Howard Hughes Medical Institute Investigators. **Dr. Ben Hall** received the first annual University of Washington School of Medicine Inventor of the Year award in 2004. **Dr. Joe Felsenstein** received an honorary doctorate in 2006 from Edinburgh University. **Dr. Mary-Claire King**, an international leader in human genetics, has also received numerous awards, including the Brinker Award for Breast Cancer Research, the 2004 Gruber Prize in Genetics from the Gruber Foundation, and in 2006 the Weizmann Award for Women in Science and the Heineken Award for Medicine from the Royal Netherlands Academy of Arts and Sciences. In addition to their numerous awards, many members of our faculty have served, or are serving, on prestigious national and international advisory boards, and are members of editorial boards of major journals.

2. How do you measure the success of your unit as a whole? What teaching, research and service performance criteria are typical in your field? Which units nationally do you consider to be your peers along these dimensions?

Success is measured in several ways. Tangible criteria include quantity and quality of research publications, research dollars procured, awards for research, invited national and international lectureships, editorial responsibilities on scientific journals, participation on national and international grant review panels and scientific advisory panels, and career success of graduate students and postdoctoral students trained. By all these criteria, the GS Department is among the best in the world. Less tangible criteria include motivating undergraduates in the classroom, quality mentorship of our graduate students, and unsuccessful attempts by our peer departments at other institutions to recruit our faculty.

The publication record of our faculty is outstanding. In the last 3 years, our faculty have published almost 60 papers in **Science**, **Nature** (including **Nature Genetics** and **Nature Structural Biology**) and **Cell**. Grant support for our faculty is strong. Almost nineteen million federal research dollars were awarded to the Department in the 2006 fiscal year. It should be noted that this assessment does not include the

substantial support awarded to 5 of our faculty by the Howard Hughes Medical Institute or the grant support of adjunct and joint faculty.

Genome Science faculty provide service and leadership to the scientific community at large by serving on many advisory boards, grant review panels and editorial boards. Several of our faculty have also served on elected boards of major societies and organized international meetings. Examples include **Peter Byers**, President of the American Society of Human Genetics (2005), Editor of the American Journal of Human Genetics (1994-1999), Chair of Gordon Research Conference on Collagen (2003); **Robert Braun**, Institute of Medicine Committee on New Frontiers to Contraception (2003), Chair of Gordon Conference on Mammalian Early Embryogenesis and Gametogenesis (2010); **Joe Felsenstein**, President, Society for the Study of Evolution (1994); **Stanley Fields**, Board of Directors Genetics Society of America (2005-2007), Council of the National Institute of General Medical Sciences of the NIH (2004-2007); **Stanley Gartler**, President of the American Society of Human Genetics (1987); **Mary-Claire King**, Advisory Committee to the Director of NIH, Institute of Medicine Council and liaison to the National Cancer Policy Board, and The Committee on Science, Engineering and Public Policy; **Maynard Olson**, Scientific Review Board, Genetics Program, Howard Hughes Medical Institute (1997-2000), Board of Directors, Genetics Society of America (2003-2005), Chairman, National Research Council on Mathematics and 21st Century Biology (2004-2005); **George Stamatoyannopoulos**, President of the American Society of Hematology (1992), President of the American Society of Gene Therapy (1996-1998); **Robert Waterston**, Chair of the Annotation of the Human Genome Working Group, National Human Genome Institute (2003 – present), Council of the Institute of Medicine and liaison to the National Cancer Policy Board (2004-2006), and National Academies Committee on Intellectual Property in Genomic and Protein Research and Innovation (2004-2005).

Our peer departments would include the Genetics Departments at Harvard, Stanford, Wisconsin, and Washington University, as well as large multidisciplinary programs at Harvard (Systems Biology), Berkeley (Graduate Group in Computational and Genomic Biology), Princeton (Quantitative and Computational Biology), the University of Pennsylvania (Genomics and Computational Biology) and Duke (Genetics and Genomics).

3. What are your unit's weaknesses? No unit is perfect. Where could yours most use improvement? What challenges or obstacles make it difficult for you to overcome these weaknesses? What further challenges do you foresee in the coming years?

Our major weakness is the underrepresentation of minorities generally on our faculty and of women amongst our younger faculty. This has been a frustration that we have been actively attempting to correct. Although our last 7 faculty hires have been white males, in our last two faculty searches we offered substantial recruitment packages to 2 outstanding women. Unfortunately, we were unsuccessful at hiring either. In both cases the candidates had partners who also wanted faculty positions. In both cases, the couples rejected the offers to the spouses. We are committed to creating a diverse faculty and will continue our efforts in this area.

4. What changes have occurred in teaching, research and service in your field over the past decade that have influenced your conception of the unit's role? What pressures, internal and external, have caused significant changes, and what further pressures and changes do you anticipate in the next ten years? What changes have taken place in the relationships between your field and other related fields? Some changes that may or may not be relevant to your unit include the rise of interdisciplinary studies, international study, experiential learning, and programs in civic education and leadership, as well as technological changes--the rise of online courses and new educational technology. Which (if any) of these have had an impact on your unit?

The major change in our field has been the sequencing of the human genome and most model organism genomes. This has been accompanied by the development of rapid high-throughput methods of assessing gene expression (e.g., gene chips), gene function (e.g., RNAi), and protein interaction (e.g., mass spectrometry and yeast two-hybrid screens). These developments, in which our faculty played key roles, have dramatically increased the quantitative component of biology and biomedicine and increased the need for strong computational and statistical skills. The Department was formed in response to these changes, creating an interdisciplinary, collaborative faculty that could exploit the opportunities created by these resources. A major goal was to create a department that would train the next generation of scientists with the skills required to be leaders in this new paradigm. The initial plan was to create a GS Graduate Program with two interrelated tracks, one emphasizing more laboratory-based genetics and genomics and a second more focused on technology development and computational biology. The objective was to train future generations of scientists across disciplines, so that students with an experimental biology background would have significant training in areas of

computational biology and instrumentation; computational students would be trained in biology and wet lab experimentation; and all students trained to develop tools for the 21st century would understand the needs of both wet lab biologists and computational scientists.

The original goal of creating separate tracks in genetics and instrumentation/computational biology has not been formally realized. Instead, we have opted for a single GS Graduate Program with a common curriculum for all students. We made this decision when we realized that the incoming students with prior experience or interest in genetics, instrumentation or computation were all interested and capable of sharing a core curriculum during the first year. Keeping these students together in a core curriculum has facilitated peer learning amongst the students.

Topics in the core curriculum include courses on Methods and Logic, Gene Regulation, Genomics, Genetic Analysis, Genomic Informatics, Protein Technologies, and Population Genetics. In addition to these courses, students with a strong biological science background, but little statistical or programming experience, receive an introduction to these topics. Initially, students with a strong quantitative background, but little biological background were given a primer on genetics. But we find that, increasingly, more quantitatively-oriented students have also acquired exposure to biology in their undergraduate experience. All of our students jointly attend weekly research department seminars, journal clubs and seminars.

With the increased size and breadth of our training faculty, students are now able to choose a thesis lab with strengths in genetics, computational biology or instrumentation. We will continue to build in these areas through additional faculty hires in the coming years. The increasing interdisciplinary nature of scientific research has also made it important for our unit to continue to increase its interactions with other units. For example, some of our faculty participate in the interdisciplinary Computational and Molecular Biology (CMB) Program. Many members of the GS Department participate in a multidepartmental Genome Training Grant. During the 2005-2006 academic year, we devoted one GS Departmental seminar slot per month to hearing talks from faculty in the Bioengineering Department.

Lastly, to introduce genome-scale analysis of biological questions to undergraduates, we have expanded our undergraduate course offerings. These include courses on Genomic Informatics, Genomes and Society, and Molecular Evolution.

5. Do you observe differences between your view of your role and college and university expectations of your unit? If so, what are these? Do you see any ways to resolve these differences?

No

6. Describe faculty participation in the process of unit governance, self-study, and strategic planning. How do your faculty participate in governance and strategic planning?

GS faculty meet monthly to discuss topics related to GS governance, new faculty hires, UW initiatives, UW policy, and student progress. Faculty subcommittees participate in new faculty recruiting, curriculum review and other Departmental issues. Faculty, post-doctoral fellows, graduate students and some staff also participate in an annual off-site, two-day retreat in which new students are introduced to the department, and the faculty meet to discuss the overall direction of the department.

7. Is mentoring junior faculty identified as a priority? Outline your unit's approach to mentoring junior faculty, graduate students, undergraduate students.

Mentoring is important at all levels. Junior faculty are assigned a senior faculty mentor with whom they meet over lunch at least once a month. Junior faculty also meet formally with the GS chair every year to review their performance, progress and concerns. In addition the chair meets informally with junior faculty as opportunities present themselves. An important and valuable form of mentoring also occurs when faculty co-teach (see Section B7 for more details).

The entire faculty meets to review student progress annually. Students are also required to meet with their supervisory committee at least once per year (twice is encouraged). A formal written report is generated after the supervisory committee meeting, documenting progress and committee requests / suggestions. The student and Department each receive a copy of this report. Additionally, all students in their second year and beyond are required to present their research annually to the department as part of the Research Reports sessions, which prompts feedback from faculty members.

In addition to providing informal feedback throughout the quarter, faculty members who have first-year students rotating in their labs fill out a detailed evaluation form at the end of each quarter. This is used during the annual student progress meeting to evaluate performance. First-year students receive verbal and / or written feedback from the graduate program coordinator (GPC – currently Colin Manoil) after this meeting. As a further means of evaluating first-year performance, the GS Department has implemented first-year rotation presentations to the Department each quarter.

SECTION B: TEACHING

1. For each faculty member in your department, please list: number of courses taught per year, number of credits taught, and total student credit hours. Numbers may be approximate and should illustrate a typical year.

Here is our 2006-2007 teaching schedule, sorted by faculty member:

faculty member / rank	courses taught
Akey, Joshua (Assistant Professor)	Genome 550 – Methods & Logic in Genetics (3 credits; co-taught w/ Robert Waterston)
Berg, Celeste (Professor)	Genome 371 – Introductory Genetics (5 credits; co-taught with Leo Pallanck) Genome 553 – Advanced Genetic Analysis (1.5 credits)
Braun, Robert (Professor)	Genome 371 – Introductory Genetics (5 credits; co-taught with Bonita Brewer) Genome 551 – Mechanisms of Gene Regulation in Prokaryotes & Eukaryotes (1.5 credits)
Brewer, Bonita (Professor)	Genome 371 – Introductory Genetics (5 credits; co-taught w/ Robert Braun) Genome 520 – Journal Club (1 credit; co-organized w/ Stanley Gartler)
Byers, Breck (Professor)	Genome 490 – Undergraduate Seminar (2 credits; co-taught w/ Samuel Miller) Genome 499 – Undergraduate Research (independent research w/ dept faculty members, credits vary; Dr. Byers facilitates lab placement for students needing assistance)
Byers, Peter (Adjunct Professor)	Genome 531 – Genetics of Human Disease (3 credits; co-taught w/ Ray Monnat)
Eichler, Evan (Associate Professor)	Genome 465 / 565 – Advanced Human Genetics (4 credits; co-taught w/ Mary-Claire King)

Felsenstein, Joseph (Professor, joint w/ Biology)	Genome 541 – Intro to Computational Molecular Biology: Molecular Evolution (3 credits; co-taught w/ William Noble) Genome 562 – Population Genetics (4 credits; taught odd years) Genome 570 – Phylogenetic Inference (3 credits; taught even years) Genome 590 – Population Genetics Seminar (1 credit)
Fields, Stanley (Professor, joint w/ Medicine)	Will be on sabbatical this year; has typically taught Genome 547 (Scientific Writing; 1.5 credits)
Furlong, Clement (Research Professor, joint w/ Medicine)	Genome 525 – Current Literature in Human Genetics (1 credit)
Gallant, Jonathan (Professor Emeritus)	Genome 490 – Undergraduate Seminar (2 credits)
Gartler, Stanley (Professor Emeritus)	Genome 520 – Journal Club (1 credit; co-organized w/ Bonita Brewer)
Green, Philip (Professor)	Genome 540 – Introduction to Computational Molecular Biology: Genome & Protein Sequence Analysis (4 credits) Genome 521 – Seminar in Computational Biology (1 credit)
Hall, Benjamin (Professor, joint w/ Biology)	No Genome courses this year
King, Mary-Claire (Professor, joint w/ Medicine)	Genome 465 / 565 – Advanced Human Genetics (4 credits; co-taught w/ Evan Eichler)
Kuhner, Mary (Research Associate Professor)	Genome 453 – Genetics of the Evolutionary Process (3 credits; taught by Joseph Felsenstein in alternate years)
MacCoss, Michael (Assistant Professor)	Genome 490 – Undergraduate Seminar (2 credits) Genome 555 – Protein Technologies (1.5 credits)

Manoil, Colin (Professor)	Genome 411 – Gene Action (5 credits; cross-listed w/ Micro 411 & co-taught w/ S. Libby) Genome 576 – Genetic & Genomic Analysis of Bacteria (1.5 credits)
Miller, Samuel (Professor, joint w/ Microbiology & Medicine)	Genome 490 – Undergraduate Seminar (2 credits; co-taught w/ Breck Byers)
Monnat, Raymond (Professor, joint w/ Pathology)	Genome 531 – Genetics of Human Disease (3 credits; co-taught w/ Peter Byers)
Nickerson, Deborah (Professor)	Genome 552 – Technologies for Genome Analysis (1.5 credits)
Noble, William (Associate Professor)	Genome 373 – Genomic Informatics (3 credits; co-taught w/ James Thomas) Genome 541 – Intro to Computational Molecular Biology: Molecular Evolution (3 credits; co-taught w/ Joe Felsenstein) Genome 559 – Intro to Statistical & Computational Genomics (1.5 credits; co-taught w/ Mark Rieder)
Olson, Maynard (Professor, joint w/ Medicine)	On sabbatical this year
Pallanck, Leo (Associate Professor)	Genome 371 – Introductory Genetics (5 credits; co-taught w/ Celeste Berg) Genome 547 – Scientific Writing (1.5 credits)
Raghuraman, M.K. (Research Assistant Professor)	Genome 371 – Introductory Genetics (5 credits)
Rieder, Mark (Research Assistant Professor)	Genome 559 – Intro to Statistical & Computational Genomics (1.5 credits; co-taught w/ William Noble)
Schivell, Amanda (Lecturer)	Biology 200 – Introductory Biology (5 credits) Genome 261 – Genomes & Society (4 credits) Genome 351 – Human Genetics: The Individual & Society (4 credits) Genome 371 – Introductory Genetics (5 credits)

Sibley, Carol (Professor)	Genome 475 – Debates in Genetics (3 credits) Genome 580 – Ethics in Biomedical Research & Teaching (1 credit)
Stamatoyannopoulos, John (Assistant Professor)	May teach proposed new course (Genome 557 – Chromatin) – yet to be determined
Swanson, Willie (Assistant Professor)	Genome 414 – Molecular Evolution (5 credits) Genome 561 – Molecular Population Genetics & Evolution (1.5 credits)
Thomas, James (Professor)	Genome 373 – Genomic Informatics (3 credits; co-taught w/ William Noble) Genome 554 – Genomic Informatics (1.5 credits)
Trask, Barbara (Professor)	No Genome courses this year
Waterston, Robert (Professor and Chair)	Genome 550 – Methods & Logic in Genetics (3 credits; co-taught w/ Joshua Akey)

2. How are teaching responsibilities allocated?

Each faculty member, with few exceptions, is expected to teach on average five weeks of undergraduate and five weeks of graduate courses. Each year a small committee (currently Bonny Brewer and Celeste Berg) reviews the curriculum assignments and works with the chair to be sure all obligations are met. In turn, the chair assigns teaching responsibilities. Teaching loads, however, do vary among the faculty. Factors contributing to this variance include historical precedent (i.e., whether faculty members have a long-standing commitment to a course or prior agreements) and current course demands. Also new hires generally are exempted from teaching in their first year and expected to teach only a single five-week course in their second year.

3. Other than classroom teaching, how are faculty involved in undergraduate student learning and development (for example, advising, mentoring, and supervising independent study)?

Many faculty members have undergraduates doing independent research in their labs.

4. How do faculty involve undergraduate students in research and scholarship?

Undergraduates function in a wide range of roles in our laboratories. Many undergraduates start as work/study students helping with media preparation, maintaining Drosophila stocks, or performing other routine tasks. Some of these students acquire more sophisticated technical skills and help graduate students and postdocs in the lab. Students also do independent research projects in labs. Undergraduate research is usually done for credit, and in some cases scholarships and fellowships are awarded to deserving undergraduates. The GS Department awards the Hershel and Caryl Roman Scholarship to one or two undergraduates per year to encourage their participation in research. Students also receive fellowships from the Howard Hughes Medical Institute. Finally, undergraduates also work in labs during the summer as part of University-wide initiated programs. One such program is the Genomics Outreach for Minorities (GenOM) project (**http://depts.washington.edu/genomics/**).

Examples of undergraduate research are given below.

Undergraduate Research

2005 – 2006

Faculty mentor name	Undergraduate student name	Research project title/description
Bonita Brewer	Andrew Hemaplardh	Characterization of a recently evolved origin of replication
Bonita Brewer	Elijah Johnston	Using a two-origin plasmid to identify sequences that cause an origin to fire late in S phase
Bonita Brewer	Lindsay Fox	Identification of a new origin of replication that was predicted by ssDNA formation
Bonita Brewer	Michael Santoro	Determining the strand bias for ssDNA formation during hydroxyurea-challenge of a rad53 yeast mutant
Breck Byers	Isaac Frye	Telomere-proximal meiotic recombination in yeast
Breck Byers	Liang Zhang	Telomere-proximal meiotic recombination in yeast
Stan Fields	Jenna McClain	Construction of an artificially regulatable promoter in yeast
Stan Fields	James Thornton	Engineering the ubiquitin machinery
Clement Furlong	Lesley Everett	Generate site-specific mutations in cloned human paraoxonase 1 (PON1)

Clement Furlong	Joshua Probert	A MatLab Program for Display and Analysis of SPR Data
Clement Furlong	Allison Forbes	Insecticide Sensitivity of Genetically Modified Mice
Jonathan Gallant	Ashley Fontelera	Role of pause sites in ribosome bypassing
Jonathan Gallant	Phu Ngo	Role of internal Shine-Dalgarno sequences in ribosome frameshifting and bypassing
Jonathan Gallant	Rachel Dexter	Upstream sequence elements affecting ribosome bypassing
Mary-Claire King	Debra Sprague	Markers for recurrence of ovarian cancer
Mary-Claire King	Kevin Roach	Identification of cryptic mutations in breast cancer families
Mary-Claire King	Martha Wilson	Yeast-based screen for mutator genes
Carol Sibley	Naheel Fataftah	Role of mutations in *Plasmodium falciparum* dihydrofolate reductase in resistance to the novel antifolate, WR99210
Carol Sibley	Stephanie Suzuki	Mutations in the *Plasmodium vivax dihydropteroate* synthase gene from South East Asian isolates
Carol Sibley	Christopher Thouvenel	Mutations in the novel thymidylate synthase gene, *thyX,* in *Mycobacterium tuberculosis*
Willie Swanson	Diana El-Hinn	Molecular Evolution of Avain ZP3
Willie Swanson	Margo Haney	Abalone Testis EST analysis
Willie Swanson	Chris Hanks	Correlation between evolutionary rates and mating systems
Willie Swanson	Roman Trotsyuk	Molecular Evolution of Mammalian ZP1
Barbara Trask	Julia Bruk	Spatial organization of DNA sequences in interphase nuclei

2004 – 2005

Faculty mentor name	Student name	Research project title / description
Celeste Berg	Karre Fisher	Establishing the *Drosophila* egg chamber culture system as a method for RNA interference in epithelial tissues
Celeste Berg	Janice Chen	The role of integrins in morphogenesis of *Drosophila* eggshell structures
Bonny Brewer	Michael Chen	Effects of genome rearrangements on yeast chromosome replication
Bonny Brewer	Andrew Hemmaplardh	Genetic variation in a yeast chromosomal origin of replication
Breck Byers	Michael Chen	"Hop1 in Meiotic Recombination"
Breck Byers	Sean Adams	"Yeast Telomere Recombination"
Stan Fields	Ha Na Yoo	Effect of cell cycle stage on yeast recombination

Clement Furlong	Lesley Everett	Properties of recombinant paraoxonase (PON1)expressed in bacteria
Jon Gallant	Seth Caldwell	Role of the A-site in ribosome bypassing
Jon Gallant	Teodora Tofoleanu	Selective charging of tRNA isoacceptors
Jon Gallant	Ashley Fontalera	Effect of tRNA level on ribosome bypassing
Jon Gallant	Fu Ngo	Effect of tRNA level on ribosome bypassing and frameshifting
Jon Gallant	Rachel Dexter	coding gap distance and the efficiency of ribosome bypassing
Mary-Claire King	Kristin Weiderholt	"Mutations in exonic splice enhancer sites reveal novel mutations predisposing to breast cancer"
Mary-Claire King	Martha Wilson	"A yeast-based screen for new breast cancer genes"
Mary-Claire King	Kevin Roach	"Cryptic mutations in BRCA1 and BRCA2 detected by a new genomic technology"
Mary-Claire King	Jake Higgins	"Technologies for clinical analysis of breast cancer-predisposing mutations"
Ray Monnat	Harkirat Sohai	Site-specific recognition of target DNA sequences by the H-DreI engineered homing endonuclease
Ray Monnat	Angie Sibounheuang	generation of site-specific DNA double strand breaks in human cells
Carol Sibley	Chris Thouvenel	structural analysis of ThyX from M. tuberculosis
Carol Sibley	Margo Haney	synergy between WR99210 and sulfas
Carol Sibley	Marnie Briceno	diversity of DHFR alleles in African samples
Willie Swanson	Roman Trotsyuk	Evolution of primate ZP1
Willie Swanson	Denise Dawson	Evolution of primate sperm channel CatSper1
Barbara Trask	Jessie Hsu	Evolutionary Analysis of Human Olfactory Receptor Genes

2003 – 2004

Faculty mentor name	Student name	Research project title / description
Celeste Berg	Jessica Lee	Evolutionary changes in eggshell structures in fruitflies
Celeste Berg	Kyle Tobler	Enhancer trapping in flies using the GAL4 system
Celeste Berg	Janice Chen	Role of integrins in regulating cell migrations in Drosophila oogenesis
Celeste Berg	Hoi Tang	Constructing transgenes containing isoforms of the SOX92D gene
Celeste Berg	Karre Fisher	Developing a method for culturing Drosophila oocytes

Breck Byers	Michael Chen	Sequence analysis of genes in other species related to the yeast HOP1 gene.
Breck Byers	Jesse Green	Production and purification of yeast meiotic protein Hop1p and analysis of its DNA binding properties
Breck Byers	Teresa Lee	Tetrad dissection and fine-structure molecular characterization of recombination within crosses between yeast strains with highly heterologous DNA sequences.
Breck Byers	Stephanie Savage	Making yeast growth media and assisting in experiments to produce yeast meiotic proteins for DNA-binding analysis.
Breck Byers	Peter Schultz	Yeast tetrad analysis for the characterization of meiotic recombination events enhanced by the presence of G-rich sequences.
Breck Byers	Yvette Stevens	Construction of DNA substrates and testing their affinity for the yeast meiotic synapsis protein Hop1p.
Stan Fields	Anna Fortin	Characterization of the protein-protein interactions of yeast WW domains
Stan Fields	Seth Caldwell	Quantitative analysis of life span of yeast mutants
Clem Furlong	Qian Zhang	Polymorphisms in the human PON1 gene
Clem Furlong	Michelle Tu	Novel object testing in insecticide treated mice
Clem Furlong	Matthew Probert	Development of surface plasmon resonance (SPR) based biosensors
Clem Furlong	Allison Forbes	Toxic genomics in insecticide treated mice and behavioral testing
Clem Furlong	Nathan Yee	Enzymes involved in insecticide metabolism
Jon Gallant	Seth Caldwell	The role of the A-site codon in ribosome bypassing
Jon Gallant	Vi Dan Nguyen	Directionality of ribosome frameshifting at a hungry codon
Mary-Claire King	Kirstin Wiederholt	Human genetics of complex traits
Mary-Claire King	Jake Biggins	Human genetics of complex traits
Mary-Claire King	Kevin Roach	Human genetics of complex traits
Mary-Claire King	Martina Kubec	Human genetics of complex traits
Mary-Claire King	Maureen Waite	Human genetics of complex traits
Mary Kuhner	Yi Wang	Inferring rates of mutation in microsatellite data
Ray Monnat	Cristina Swanson	Mechanisms that insure the faithful transmission of genetic information in human somatic cells
Ray Monnat	Ursula Lang	Mechanisms that insure the faithful transmission of genetic information in human somatic cells

Ray Monnat	Patrick Wagner	Mechanisms that insure the faithful transmission of genetic information in human somatic cells
Maynard Olson	Bezawit Getahun	Intro to lab research, UW Genome Center
Maynard Olson	Keonna Harris	Intro to lab research, UW Genome Center
Maynard Olson	Adam Koerner	Intro to lab research, UW Genome Center
Maynard Olson	Karen Marin	intro to lab research, UW Genome Center
Maynard Olson	Daraun Prince	Intro to lab research, UW Genome Center
Maynard Olson	Aniel Solis	Intro to lab research, UW Genome Center
Mark Rieder	Zach Stednick	"Analysis of BRCA1 mutations affecting gene expression"
Carol Sibley	Brian Rezvani	Chlorproguanil resistance in *P. falciparum*
Carol Sibley	Marnie Braceno	Rare alleles of dihydrofolate reductase that confer high levels of drug resistance in *P. falciparum*
Carol Sibley	Daniel Bates	Mutants of *M. tuberculosis* that are resistance to antifolate drugs
Willie Swanson	Susan CeRrillo	Molecular evolution of a mammalian sperm protein
Barbara Trask	Jessie Hsu	Olfactory receptor gene variation in humans

2002 -2003

Faculty mentor name	Student name	Research project title / description
Bonita Brewer	Mary Stewart	Characterization of deletions in an origin-free region of a yeast artificial chromosome in a check-point deficient yeast strain.
Bonita Brewer	Christina Wilson	Construction of a stable CLB6 protein and its potential rescue of the CLB5 mutant phenotype in yeast.
Breck Byers	Sean Adhikari	Enhanced meiotic recombination by quadruplex DNA
Breck Byers	Teresa Lee	Mapping gene conversion tract lengths.
Breck Byers	Yvette Stevens	Hop1 protein binding by quadruplex DNA.
Breck Byers	Jesse Green	Purifying Hop1 protein for affinity analysis.
Peter Byers	Harry Keller	Literature review and meta-analysis of the treatment of children and Adults with osteogenesis imperfecta using bisphosphonates
Stan Fields	Anna Fortin	Two-hybrid analysis of yeast WW domain-mediated protein-protein interactions.
Stan Fields	Rachel Rodman	An in vivo system to produce a large pool of mutant proteins

Jonathan Gallant	Seth Caldwell	Identification of sequences conducive to ribosome bypassing.
Jonathan Gallant	Mika Matsuzaki	Petri plate assay of ribosome bypassing stimulated by tRNA depletion.
Jonathan Gallant	Scott Mercer	Role of peptidyl-tRNA in robosome bypassing.
Jonathan Gallant	Alan Worsley	Role of peptidyl-tRNA in robosome bypassing.
Stan Gartler	Juan Liao	Comparative level of DNA methylation on the active and inactive mammalian X chromosomes
Daniel Gottschling	Elizabeth Johnson	Assay to determine whether telomeres on a given chromosome are within close physical proximity to one another in *Saccharomyces cerevisiae*
Benjamin Hall	Lan Dai	Amplification and Sequencing of two paralogous RNA Polymerase genes from Rhododendron
Deborah Nickerson	Zachary Stednick	Human DNA diversity
Deborah Nickerson	Bryan Howie	Sequence Diversity in the Great Apes
Leo Pallanck	Ty DeSilva	DJ-1/park7 and Parkinson's Disease
Leo Pallanck	Allison Legler	SCA2 and ataxia
Carol Sibley	Kashif Bhatti	Mutant alleles of the dihydrofolate reductase gene
Carol Sibley	Brian Rezvani	Dihydrofolate reductase gene from Plasmodium falciparum

Genome 499 (undergraduate research) enrollment
(figures prior to 2002 reflect combined Genetics / MBT enrollment)

	Winter	Spring	Summer	Autumn
2006	14	16	4	n/a
2005	11	12	3	16
2004	13	15	7	8
2003	12	14	1	12
2002	13	10	8	9
2001	8	13	5	9
2000	8	13	5	9
1999	17	15	3	11
1998	11	16	6	13
1997	17	17	7	14

Selected Publications with undergraduate co-authors:

Celeste Berg

French, R. F., **Cosand**, K. A., and Berg, C. A. 2003. The Drosophila female sterile mutation twin peaks is a novel allele of tramtrack and reveals a requirement for TTK69 in regulating epithelial morphogenesis. Developmental Biology 253: 18 – 35.

Ward, E. J., Thaipisuttikul, I., **Terayama**, M., French, R. L., Jackson, S. M., **Cosand**, K. A., **Tobler**, K. J., Dorman, J. B., and Berg, C. A. 2002. GAL4 expression patterns during Drosophila development. Genesis 34: 46 – 50.

Volpe, A., Horowitz, H., **Grafer,** C. M., Jackson, S. M., and Berg, C. A. 2001. Drosophila rhino encodes a female-specific chromo-domain protein that affects chromosome structure and egg polarity. Genetics 159: 1117 – 1134.

Stan Fields

Hesselberth JR, Miller JP, **Golob A**, Stajich JE, Michaud GA, Fields S. Comparative analysis of Saccharomyces cerevisiae WW domains and their interacting proteins. Genome Biol. 2006;7(4):R30. Epub 2006 Apr 10.

Powers RW 3rd, Kaeberlein M, **Caldwell SD**, Kennedy BK, Fields S. Extension of chronological life span in yeast by decreased TOR pathway signaling. Genes Dev. 2006 Jan 15;20(2):174-84.

Schwartz H, Alvares CP, White MB, Fields S. Mutation detection by a two-hybrid assay. Hum Mol Genet. 1998 Jun;7(6):1029-32.

Jon Gallant

Gallant J, Bonthuis P, Lindsley D, **Cabellon J, Gill G, Heaeton K, Kelley-Clarke B, MacDonald L, Mercer S, Vu H, and Worsley A**. On the role of the starved codon and the takeoff site in ribosome bypassing in Escherichia Coli. J. Mol. Biol. 2004 Sep 17; 342(3): 713-24.
Lindsley D, Bonthis P, Gallant J, **Tofoleanu T**, Elf J, and Ehrenberg M. Bypassing at serine codons as a test of the model of selective transfer RNA charging. EMBO Rep. 2005 6(2): 147-50.

Lindsley D, Gallant J, Doneanu C, Bonthuis P, **Caldwell S**, and **Fontelera A**. Spontaneous ribosome bypassing in growing cells. J. Mol. Biol. 2005 349: 261-272.

Sam Miller

Bader MW, Sanowar S, Daley ME, **Schneider AR**, Cho U, Xu W, Klevit RE, Le Moual H, Miller SI. Recognition of antimicrobial peptides by a bacterial sensor kinase. Cell. 2005 Aug 12;122(3):461-72. ,

SchererCA, **Cooper E**, Miller SI. The Salmonella type III secretion translocon protein SspC is inserted into the epithelial cell plasma membrane upon infection. Mol Microbiol. 2000 Sep;37(5):1133-45.

Gunn JS, Lim KB, **Krueger J**, Kim K, Guo L, Hackett M, Miller SI. PmrA-PmrB-regulated genes necessary for 4-aminoarabinose lipid A modification and polymyxin resistance.Mol Microbiol.

1998 Mar;27(6):1171-82.

Maynard Olson

Stover, C.K., Pham, X.Q., Erwin, A.L., Mizoguchi, S.D., Warrener, P., Hickey, M.J., Brinkman, F.S.L., Hufnagle, W.O., Kowalik, D.J., Lagrou, M., Garber, R.L., Goltry, L., Tolentino, E., Westbrock-Wadman, S., Yuan, Y., Brody, L.L., Coulter, S.N., Folger, K.R., Kas, A., Larbig, K., Lim, R., Smith, K., **Spencer, D**., Wong, G.K.-S., Wu, Z., Paulsen, I.T., Reizer, J., Saier, M.H., Hancock, R.E.W., Lory, S., and Olson, M.V. (2000). Complete genome sequence of Pseudomonas aeruginosa PA01, an opportunistic pathogen. Nature 406: 959-964.

Spencer, D.H., Kas, A., Smith, E.E., Raymond, C.K., Sims, E.H., Hastings, M., Burns, J.L., Kaul, R., and Olson M.V. (2003). Whole-genome sequence variation among multiple isolates of Pseudomonas aeruginosa. J. Bacteriol. 185, 1316-1325.

Carol Sibley

Wooden, JM, Hartwell, LH, **Vasquez, B**, Sibley, CH, 1997. Analysis in yeast of antimalaria drugs that target the dihydrofolate reductase of Plasmodium falciparum. Molec. Biochem. Parasitol. 85: 25-40.

Mookherjee, S, Howard, V, Nzila-Mouanda, A, Watkins, W, Sibley, CH, 1999. Identification and analysis of dihydrofolate reductase alleles from Plasmodium falciparum present at low frequency in polyclonal patient samples. Am. J. Trop. Med. Hyg. 61: 131-140.

Ferlan, JT, Mookherjee, S, Okezie, IN, Fulgence, L, Sibley, CH, 2001. Mutagenesis of dihydrofolate reductase from Plasmodium falciparum: analysis in Saccharomyces cerevisiae of triple mutant alleles resistant to pyrimethamine or WR99210. Mol. Biochem. Parasitol. 113: 139-150.

Lau, H, Ferlan, JT, Brophy, VH, Rosowsky, A, Sibley, CH, 2001. Efficacies of lipophilic inhibitors of dihydrofolate reductase against parasitic protozoa. Antimicrob. Agents Chemother. 45: 187-195.

Hastings, MD, **Bates, SJ**, Blackstone, EA, Monks, SM, Mutabingwa, TK, Sibley, CH, 2002. Highly pyrimethamine-resistant alleles of dihydrofolate reductase in isolates of Plasmodium falciparum from Tanzania. Trans. R. Soc. Trop. Med. Hyg. 96: 674-676.

Hastings, MD, **Porter, KM**, Maguire, JD, Susanti, I, Kania, W, Bangs, MJ, Sibley, CH, Baird, JK, 2004. Dihydrofolate Reductase Mutations in Plasmodium vivax from Indonesia and Therapeutic Response to Sulfadoxine Plus Pyrimethamine. J. Infect. Dis. 189: 744-750.

Bates, SJ, Winstanley, PA, Watkins, WM, Alloueche, A, Bwika, J, Happi, TC, Kremsner, PG, Kublin, JG, Premji, Z, Sibley, CH, 2004. Rare, highly pyrimethamine-resistant alleles of the Plasmodium falciparum dihydrofolate reductase gene from 5 African sites. J. Infect. Dis. 190: 1783-1792.

James Thomas:

Stewart, M.K., N. Clark, G. Merrihew, **E. Galloway**, and J.H. Thomas. 2005. High genetic diversity in the chemoreceptor superfamily of *C. elegans*. Genetics 165, 1985-1996. DOI 10.1534/genetics.104.035329.

Barb Trask:

Trask BJ, Friedman C, Martin-Gallardo A, Rowen L, **AkinbamiC**, **Blankenship J**, Collins C, Giorgi D, Iadonato S, Johnson F, Kuo WL, Massa H, Morrish T, Naylor S, Nguyen OT, Rouquier

S, Smith T, Wong DJ, Youngblom J, van den Engh G. Members of the olfactory receptor gene family are contained in large blocks of DNA duplicated polymorphically near the ends of human chromosomes. Hum Mol Genet 7:13-26, 1998.

SchladorM, Bakken T, **Hsu J**, Young JA, Trask BJ. Episodes of positive or relaxed selective pressures on olfactory receptor genes in primate evolution. To be submitted, 2006.

5. How does the department evaluate the instructional effectiveness of faculty?

The Department receives teaching evaluations collected from students during each course, which are returned to individual faculty members for improvement of the course in subsequent rounds. These evaluations are also discussed in the formal periodic review of each faculty member by the chair. In addition, informal feedback is often given by one faculty member to another when two or more faculty co-teach a course. We are also considering adopting a formal peer review system.

6. Please summarize the data you collect, possibly using OEA or CIDR, to evaluate the impact of your teaching on student learning. You might want to focus on illustrative examples. Please describe selected specific changes you have made in response to the data you have collected.

The Department uses course evaluations collected from students during each course to evaluate the impact of our teaching on student learning. These evaluations are taken seriously and are used to improve course design and student learning in subsequent years.

7. What procedures, such as mentoring junior faculty, does the department use to help faculty improve undergraduate teaching and learning? What training and support is provided to TAs to help them be effective in their instructional role?

Our main method of mentoring junior faculty has been to team them with senior faculty in courses that are co-taught. Starting this academic year (2006/2007), faculty who are scheduled to teach GS371 (Introductory Genetics) in the next year (2007/2008), and who have not previously taught the course, will “shadow” the faculty teaching the course this year. The long-term goal of this course, which is taught all four quarters, is to rotate our entire faculty through GS371 in two-year assignments.

All teaching assistants (TAs) assigned to GS courses receive formal instruction at the beginning of each academic year. This ~1/2 day of instruction, taught by **Professor Bonny Brewer**, teaches the TAs proper professional conduct in the classroom. In addition, and depending on the course, TAs also receive instruction during the

quarter the course is being taught. For example, TAs for GS371 have weekly 1-2 hour meetings with the faculty member teaching the course and with **Lecturer Anne Paul**, who is responsible for organizing the lab section of the course. **Dr. Paul** prepares the students for the following week's lab and, along with the faculty member, resolves any questions concerning course material, grading, student conduct, etc.

8. How does the unit track and promote innovations and best practices in undergraduate and graduate student learning?

Best practices in teaching and learning are usually tracked by informal discussion between faculty and students. Most faculty genuinely want to do a good job teaching. When a course is taught well, especially when it involves innovation, word quickly spreads. A good example is the outstanding teaching of **Research Assistant Professor Mosur Raghuraman** in GS371 (Introductory Genetics). Many of the faculty who also teach GS371 have adopted **Dr. Raghuraman's** lecture material into their courses. Other examples include faculty sharing ways to teach that do not involve lecturing. Many of the faculty who teach in GS371 have introduced in-class assignments and group problem solving.

SECTION C: RESEARCH & PRODUCTIVITY

1. How does your unit balance the pursuit of areas of scholarly interest by individual faculty with the goals and expectations of the department, school, college and University? How are decisions involving faculty promotion, salary and retention made?

We balance individual faculty goals with expectations of the Department and University by sharing teaching responsibilities, Departmental committee responsibilities, and University service. To support our newest faculty hires we assign a lighter teaching load in the first few years of their appointment as Assistant Professors. Service on Departmental and University committees rotates amongst faculty.

The criteria for faculty promotions have been established by the faculty. Explicit instructions for promotion are given to every faculty member in writing at the time of hire and during a conference with the chair no less than a year prior to mandatory renewal or earlier upon request. The progress of the faculty member in meeting

these expectations is discussed with each faculty member in their periodic review by the chair. Faculty members up for promotion provide the Department with a complete CV, a research plan, a description of their teaching accomplishments and a list of possible outside referees. All Departmental faculty of higher rank review the documents at a faculty meeting and vote on whether to recommend promotion. Overall, the promotion process is very democratic and promotes a spirit of collegiality. The chairman has been delegated by the faculty the responsibility for making salary decisions. In matters of retention, the chair discusses the issues with the faculty member involved, consults with appropriate faculty members and decides on a course of action.

2. How are junior faculty members mentored in terms of research and creative productivity?

Junior faculty are assigned a senior member of the faculty as their mentor. They also meet at least yearly with the chair. Recent faculty hires (e.g., **Drs. Mike MacCoss**, **Josh Akey**, **Bill Noble** and **John Stamatoyannopoulos**) have also formed research collaborations with more senior faculty members. Lastly, regular Departmental activities provide opportunities for junior and senior faculty to discuss their research; our new building was designed to facilitate such interactions.

3. What has been the impact of your research on your field and more broadly over the past five years?

The way in which basic and biomedical research is practiced has changed dramatically in the last 10 years. The old paradigm mostly involved the sequential investigation of one gene, one protein, or even one disease, at a time. Although it is still important to investigate single genes and proteins in depth, it is now possible, and usually desirable, to investigate the contribution of the whole genome. This applies to the dissection of complex traits in model organisms (e.g., **Josh Akey** **Celeste Berg**) and humans (e.g., **Evan Eichler**, **Debbie Nickerson**, and **Mary Claire King**), building collections of protein interactions in yeast (e.g., **Stan Fields**), studying the replication timing of chromosomal origins in yeast (e.g., **Bonny Brewer** and **M. K. Raghuraman**), investigating the developmental expression of all *C. elegans* genes (e.g., **Robert Waterston**), mapping of transcription factor binding sites across the genome (e.g., **John Stamatoyannopoulos** and **William Noble**), detecting patterns of mutation in the human genome (e.g., **Phil Green**), improving methods to analyze mass spectrometry data (e.g., **Michael MacCoss** and **William**

Noble), and comparative sequence analysis and the construction of phylogenies (e.g., **Joe Felsenstein** and **Mary Kuhner**). This new paradigm is possible because of advances in our field; these include the availability of whole genome sequence, the application of machine learning tools to large biological data sets, the discovery of new mass spectrometry methods, and the development of new approaches to investigate gene expression and protein-protein interaction. Our faculty have helped shape and drive this new paradigm.

4. In what ways have advances in your discipline, changing paradigms, changing funding patterns, new technologies, or other changes influenced research, scholarship, or creative activity in your unit?

A major impact of this change in paradigm has been in the research focus of faculty hired over the last several years. All of our new faculty have exceptionally strong computational and technical skills. To accommodate the greater reliance on computation and technology development in our field, we designed highly flexible lab spaces in the new Foege Building. Computational and experimental faculty will share open lab space on individual floors. We expect this configuration will foster collaboration between faculty members and strengthen interdisciplinary research within our Department.

5. Some units are more heterogeneous than others. What variations exist among your faculty in terms of methodologies, paradigms, or subfield specializations? Are faculty offices all in the same building, or are they geographically dispersed? What strengths and weaknesses for the unit as a whole are generated by differences among its faculty? Do any of these differences generate obstacles to communication? If so, what strategies has the unit developed to promote communication between different constituencies, and how successful have these strategies been?

The GS Department is deliberately heterogeneous and is likely to become even more so over the next several years, as we foster collaboration across disciplines within our own department. We are very aware of the need to maintain cohesiveness within the Department and are taking several steps to insure that this happens. As just mentioned, we are not segregating our faculty in the new building by expertise (experimental, computational, and technology development). By intermingling faculty with diverse interests on the same floor, we hope to foster collaboration and unity. New faculty are hired in areas that we hope will create synergy with existing faculty members. All of our students take the same set of core courses during their first year, and the faculty work together to ensure that the courses represent a cohesive introduction to Genome Sciences. All faculty, postdocs, students and staff

attend our three weekly Departmental events: seminar, journal club, and research reports. Many members of the Department also attend the weekly Computational Biology seminar. All faculty participate in an informal faculty seminar series during the summer quarter. In these luncheons individual faculty present their research in a chalkboard format that encourages interaction and informality. Lastly, the Department has an annual 3-day retreat which all teaching faculty, graduate students and postdocs are strongly encouraged to attend.

Increasing the diversity of our faculty also requires that we recruit new students that reflect that diversity. We are certainly having success in recruiting new students with computational strengths. However, we have seen in the past few years a decrease in the number of students with strong experimental backgrounds. One possible reason for this trend is the perception by the students that the number of experimental labs available for PhD dissertation work is limited. To address this issue we will continue to attempt to hire new experimental faculty. We have also entered a formal agreement with several of the other basic science departments to allow our first-year students to do rotations in labs outside of our Department during the last quarter of their first year. Students who decide to enter the lab of a member of our teaching faculty, whose primary appointment is outside our Department, are allowed to do so.

6. What impediments to faculty productivity exist, and do you see ways of reducing these?

The primary impediment is the growing bureaucracy of the University, mandated by local, State and Federal regulations involving grants and contracts, chemical inventories, animal care, human subjects approval, compliance issues, reports and committee work, most of which cannot be delegated to support staff within the labs or the Department. These duties divert the attention and effort of principal investigators from their most important endeavors, which are teaching and research. Expanded implementation of electronic handling of some of these issues would help. Central University administrative offices that compile or file these materials on behalf of research departments might also be worthwhile.

7. What steps has your unit taken to encourage and preserve productivity on the part of all segments of your staff? How are staff recognized and rewarded? What programs are in place to support professional development of staff?

Academic staff are encouraged to participate in nearly all of our academic activities. These include attending seminars, research reports, journal clubs, and the annual retreat. We could do a better job of having our academic staff present talks at some of these same activities.

Administrative staff meet monthly as a large group and more frequently within their areas of operation. The larger group meeting usually includes a brief talk by a lab head to help the staff understand the work of the department and its importance, as well as updates on each group's accomplishments and challenges, departmental plans, and individual contributions. The staff are encouraged to attend training classes, paid by the department, to upgrade their current skills and develop new ones. Brainstorming sessions to address general problems are held frequently. The senior administrative staff meet monthly as well to work together in addressing business practices and policies of the department. They are encouraged to serve on SOM or UW committees to develop policies or processes affecting many departments and are recognized as experts in their fields. They are encouraged to upgrade their skills by taking department-paid classes and by attending one national meeting each year.

SECTION D: RELATIONSHIPS WITH OTHER UNITS

In what ways do you collaborate with units at other institutions or at the University of Washington? What are the impacts of these collaborations? Do members of your unit engage in or have opportunities to engage in interdisciplinary research? Do ties to other units or other kinds of interdisciplinary opportunities aid you in recruiting new faculty and graduate students? In what ways, if any, do they improve your graduate and undergraduate education? Do you face impediments to developing interdisciplinary research or connections with other units? How could the university aid you in strengthening such ties?

There is an expectation of faculty participation in the governance of the Department, the College or School, and the /University. How do faculty members within your unit meet this expectation? How is participation in shared governance encouraged and valued?

We include in our faculty several Affiliate, Adjunct, and Joint faculty from other departments here at the UW and the Hutch. These appointments help build bridges between the home departments of these faculty (Biochemistry, Biological Structure, Biology, Biostatistics, Computer Science and Engineering, Medicine, Microbiology, Pathology, Pediatrics and Statistics) and the GS Department.

Nearly all of our faculty engage in extensive collaborations with other investigators

here at the UW and at other institutions. A 2006 survey of our faculty indicated that members of our faculty are currently collaborating with faculty in the Departments of Biochemistry, Biology, Bioengineering, Biostatistics, Chemistry, Electrical Engineering, Health Services, Lab Medicine, the Locke Computer Center, Medicine, Microbiology, Neurology, Pathobiology, Pathology, Pharmacology, Psychiatry and Behavioral Sciences, Radiology, and the Institute for Systems Biology. These interdisciplinary collaborations lead to joint publication of research papers, service on student committees, interdepartmental journal clubs, participation in training grants, and the acquisition of shared funding.

Many of our faculty collaborate on research grants. A few include **Stanley Fields**, who participates in the Yeast Resource Center with Trisha Davis, Eric Muller and David Baker of Biochemistry; a Structural Genomics Grant with Wim Hol, Christophe Verlinde, Ethan Merritt and David Baker of Biochemistry, and Peter Myler of SBRI/Pathobiology; a Cystic Fibrosis Program Grant with Sam Miller (Medicine), and Bonnie Ramsey and Jane Burns (Children's Hospital); the NSF Science and Technology Center with Lee Hood (ISB), John Yates (Scripps), Rudi Aebersold (ISB and University of Basel), Barb Trask (FHCRC), Ger ven den Engh (ISB), Tim Hunkapiller (Applera) and Debbie Nickerson; **Robert Braun** participates in two NIH-funded Center grants with William Bremner (Medicine), Bertil Hille (Physiology and Biophysics), Stan McKnight (Pharmacology), Joe Beavo (Pharmacology), Robert Steiner (Physiology and Biophysics), and Mike Griswold (Dean of the College of Sciences and Professor of Molecular Biosciences at Washington State University); **Bill Noble** shares a grant with Jeff Bilmes in Electrical Engineering. Similar accountings could be made for most of our faculty.

Several members of our faculty whose primary appointments are in GS also teach outside of our Department. For example; **Joe Felsenstein** teaches the CSE 590c seminar, which is part of the CMB program, Biology 550 (Evolution and Systematics seminar) and the Astrobiology seminar (ASTBIO 501); **Leo Pallanck** teaches a course in the Neurobiology and Behavior Program, entitled, "Molecular Basis of Neurodegenerative Disease"; **Willie Swanson** has taught Zoology 571, (Evolutionary Genomics and Bioinformatics) and lectured in a course at Friday Harbor labs for the last 3 years; and **Carol Sibley** has taught several courses in Pathobiology and Biochemistry, all related to drug resistance in parasites.

All of these interactions enrich our graduate program by providing our students with broad scientific exposure, as well as contacts with faculty, students and postdocs in other departments.

SECTION E: DIVERSITY

The University is committed to providing a supportive environment for all members of its community and ensuring that each is included in the life of the University in ways that benefit professional development and success. Underrepresented groups can vary by field, but are most commonly identified by gender, race, or ethnicity.

1. Describe for your unit the inclusion of underrepresented groups for students (by entering cohort), faculty (by rank) and staff.

2006: 10 new students total, 2 women, 1 minority student

2005: 14 new students total, 4 women, 2 minority students

2004: 13 new students total, 2 women, 1 minority student

2003: 8 new students total, 5 women, 0 minority students

2002: 6 new students total, 3 women, 2 minority students

While recruiting and maintaining a diverse faculty body is an important departmental goal, none of our current faculty members are from underrepresented racial or ethnic groups. Our teaching faculty comprise twelve women and 35 men.

2. Please provide data comparing the teaching loads and other duties of any members of underrepresented groups in your unit to others of comparable professorial rank.

Our Department unfortunately does not currently have any faculty members from underrepresented racial or ethnic groups. For teaching loads among female and male faculty members in a typical year, please see our response to section B, question 1.

3. What steps, including outreach and recruitment, has your unit taken to ensure an environment that values diversity and supports all faculty, students and staff, including members of underrepresented groups? Have you been able to retain students and faculty from these groups once you have recruited them? What factors aid or impede your efforts to recruit and retain members of underrepresented groups? Is there anything the University can do to help you with recruitment and retention?

Genome Sciences is committed to having a diverse student body. We make extensive outreach efforts, particularly in sending Departmental representatives to

the national science conferences targeting minority students, including ABRCMS (Annual Biomedical Research Conference for Minority Students), SACNAS (Society for the Advancement of Chicanos and Native Americans in Science), and AISES (American Indian Science and Engineering Society). Recent examples of conferences our representatives have attended include 2004 SACNAS (Austin, TX); 2004 AISES (Anchorage, AK); and 2005 ABRCMS (Atlanta, GA). We expect to participate in 2 conferences of this sort every year for the foreseeable future, including 2006 SACNAS (Tampa, FL) and ABRCMS (Anaheim, CA). The PI of the Genome Training Grant (**Stanley Fields**) is expected to attend a meeting on diversity each year run by the National Human Genome Research Institute; **Willie Swanson** from GS is attending this year while **Dr. Fields** is on sabbatical.

We have had some success in recruiting and retaining minority students, but we hope to increase our student diversity. As of Autumn Quarter 2006, 5 of our 57 students will be from underrepresented racial or ethnic groups. These figures fluctuate as students graduate and new students enroll; for example, at the end of Spring 2006, 6 of 52 students were from underrepresented groups.

One of the reasons we have had good success in retaining students is that our departmental culture has traditionally been very collaborative and supportive. Students and faculty from different labs and UW departments collaborate extensively on research projects. Our Department has several weekly events – Genome Sciences Seminars, ComBi Seminars, Journal Club, and Research Reports; all of which are very well attended by faculty and students, an add to the collegial atmosphere. The Department also sponsors an annual retreat and weekly social gatherings, which further facilitate the supportive atmosphere our faculty and students have come to expect.

A current impediment to our recruiting goals is that we simply do not have many minority applicants. Student attendees at national conferences and graduate fairs have indicated to our staff that geography plays a major role – students from the southeast in particular are sometimes reluctant to consider relocating far from their families.

Still, we are confident that our two-pronged approach – advertising our program nationally (attending national conferences and sending mailings to colleges with large minority populations) while also participating in local pipeline efforts – will over time yield the desired results.

4. Does your unit work with the Graduate Opportunity Minority Achievement Program (GO-MAP) or Office of Minority Affairs (OMA) on student recruitment and retention? How is your unit involved in collaborative or university-wide efforts to increase the diversity of students and faculty?

Our Department works with GO-MAP and with diversity outreach staff in the School of Medicine in an effort to improve our student diversity. Perhaps the most important collaborative effort our Department makes is participation in pipeline efforts such as "The Bioscience Experience" - founded and administered by the diversity outreach staff in the School of Medicine, which provide local minority high school students with a hands-on introduction to scientific research. Our faculty members have long participated in programs sponsored by the Howard Hughes Medical Institute, the UW Genomic Outreach for Minorities program, and others that place underrepresented minority students in labs to provide an opportunity for extensive research experience. We also receive funding through a supplement to an NIH grant to support a group headed by **Dr. Maureen Munn** who develop and present genome science workshops in area high schools populated by underrepresented minorities and run an extensive teacher-training effort every summer.

Additionally, the graduate program assistants of the UW Biomedical Ph.D. programs meet quarterly to discuss recruiting issues and related topics. These collaborations have resulted in a brochure describing our programs targeted toward minority students; fliers targeted toward Spanish-speaking high school students encouraging them to consider the sciences; and a website (**http://depts.washington.edu/biophd/**) advertising our programs. We have also recently agreed to establish a joint presence at national graduate fairs targeting minority populations (SACNAS, ABRCMS, AISES). This will provide shared financial resources for programs like ours, which would attend anyway, and a recruiting presence for other programs that would not otherwise have been able to afford the cost of a booth and staffer.

5. Has the increased diversity of the student body and/or faculty in your department generated any changes in your curriculum? In your unit's academic culture or climate? If so, what are the impacts of these changes? Is there anything the University or College can do to help you with these efforts?

No, all of our students, regardless of their race or ethnicity, have the same opportunities and requirements.

SECTION F: DEGREE PROGRAMS

1. Doctoral program

a. Describe the objectives of your doctoral degree program(s) in terms of student learning and other relevant outcomes, as well as its benefits for the academic unit, the university, and region. Compare your objectives with those for programs at institutions you think of as peers. (Please attach a curriculum description as an appendix to this report.)

Genome sciences involve the study of genomes and their function. This rapidly evolving area includes, but is not limited to, the acquisition and organization of whole genome sequence, the study of genome architecture, gene expression, and gene and protein function. Although some of our students continue to investigate single genes and proteins in depth, many of our students interrogate the whole genome for biological function and involvement in human disease. We strive to train our students to become outstanding scientists, educators and eventual leaders in their field. Our expectation is that our students will compete successfully for the best postdoctoral positions leading eventually to faculty positions at the most competitive institutions. Some will move to biotechnology, where we expect them to compete for the best available jobs. We also expect some of our students to teach at undergraduate institutions and to work at government agencies and nonprofit organizations. To prepare our students for these positions, we teach them sound fundamental skills in laboratory experimentation, computational biology and genomic informatics. Depending on the individual labs in which our students receive their training, they will acquire further training in computational biology, technology development, and experimental genome science.

To achieve these goals, all of our students have a shared curriculum of core courses during their first year (see below), and an individualized curriculum in subsequent years. First-year students also meet for one quarter with a faculty group to critique journal club presentations and prepare their own journal club presentation. Students rotate in 3-4 potential thesis laboratories during their first year. During these

rotations they become acquainted with the scope and style of science within our Department, learn important skills, and investigate potential labs for their thesis work. The rotations also provide an opportunity for faculty to evaluate the progress of the students and to begin the mentoring process. Upon entering a lab, students form a thesis committee of 5 faculty members. The students are required to pass a general exam (an oral defense of a written proposal for their thesis work) by the end of their second year. All of our students gain substantial experience in formal public presentation of their thesis work and of the scientific literature. Beginning in the second year, students are required to give yearly 30-minute presentations of their thesis work to the Department. Beginning in the first year, students participate in the Department's weekly journal club; students present once per year. They also meet yearly (sometimes more often) with their faculty thesis committee.

Throughout their graduate studies, students are expected to attend the Department's weekly seminar. Some of them also attend the weekly ComBi seminar and are encouraged to participate in specialty journal clubs and research reports held in other Departments on the UW and FHCRC campuses.

Curriculum Description:

Required Graduate Course Sequence:

(All core courses are taken during the first year in the program)

Autumn Quarter:

- GENOME 501: Lab Rotation
- GENOME 520: Journal Club
- GENOME 550: Methods & Logic in Genetics
- GENOME 551: Mechanisms of Gene Regulation in Prokaryotes and Eukaryotes
- GENOME 552: Genomics

Winter Quarter:

- GENOME 501: Lab Rotation
- GENOME 520: Journal Club
- GENOME 553: Genomic Analysis
- GENOME 554: Genomic Informatics
- GENOME 559: Introduction to Statistical and Computational Genomics (1.5 cr), to be taken by students with little computational background. Not for students in the CMB program.
- any desired elective, so long as the total number of credits is between 10 - 18

Spring Quarter:

- GENOME 501: Lab Rotation
- GENOME 520: Journal Club
- GENOME 555: Protein Technologies
- GENOME 561: Population Genetics
- Any desired elective, so long as the total number of credits is between 10 - 18

Undergraduate & Graduate Course descriptions:

GENOME 261 Genomes and Society
Explores current technological advances in genome research and how these advances are impacting society. Topics include sequencing of the human genome, stem cell research, cloning, genetically modified foods, immunizations/public health, and genetic therapy. Appropriate for non-science majors.

GENOME 351 Human Genetics: The Individual and Society
Principles of Mendelian inheritance as illustrated by human traits and diseases; chromosomes and sex determination; distribution of genes in populations; natural selection and evolution; counseling and genetic engineering; ethical issues. Appropriate for non-science majors.

GENOME 371 Introductory Genetics
Covers gene transmission, including chromosome mapping, genetic pathways' mutational analysis of biological processes emphasizing mutations affecting chromosome transmission. Introduction to genomics--cloning and sequence analysis of whole genomes. Emphasizes formal genetic mechanisms, molecular techniques. For biological sciences majors.

GENOME 372 Gene Structure and Function
Explores the structure of genes and genomes, the mechanism and control of transcription and translation, the molecular mechanisms of mutation, transposition and cancer, and the identification of human disease genes.

GENOME 373 Genomic Informatics
Focuses on methods for analyzing large genetic data sets and their application to biological problems, including sequence alignment and search methods, gene prediction, phylogenetic trees, and microarray analysis. Requires basic programming skills.

GENOME 411 Gene Action
Molecular genetics: description of fundamental genetics processes such as mutation, repair, genetic exchange, recombination, and gene expression. Use of genetic strategies to analyze complex biological processes. Focus is on prokaryotic organisms.

GENOME 414 Molecular Evolution
Survey of empirical approaches to the study of molecular evolution and ecology, drawing on examples from a variety of taxa and the recent literature. Topics include DNA sequencing and systematics, fingerprinting approaches in behavioral ecology, and adaptive evolution at the molecular level.

GENOME 453 Genetics of the Evolutionary Process
Contributions of genetics to the understanding of evolution. Processes of mutation, selection, and random genetic events as they affect the genetic architecture of natural populations and the process of speciation. Emphasis on experimental data and observation, rather than mathematical theory.

GENOME 454 The Origins of Genetics
Discovery and eventual triumph of Mendelism in the early twentieth century. Concepts of heredity from ancient times to the nineteenth century. Mendel's work and its rediscovery.

Evidence contributing to cornerstone of classical genetics -- the chromosome theory of heredity.

GENOME 465 Advanced Human Genetics
Explores genetic analysis of naturally occurring variation in humans; origins and consequences of mutation, as mediated by selection, migration, population structure and drift; approaches to finding human disease genes and characterizing them at the molecular level; relevance of to other species to analysis of human genes.

GENOME 466 Cancer Genetics
Focuses on three types of cancer-related genetics. DNA repair, mitotic recombination, chromosome loss and imbalance, and other aspects of genomic instability. Metastatic cancer as an example of natural selection and evolution. Yeast and nematodes as models for the study of cancer genetics.

GENOME 475 Debates in Genetics
Utilizes the original scientific literature as the basis for discussion of a range of genetic issues that impact society Discussions are student-led; evaluations are based both on participation in class and on a research paper.

GENOME 490 Undergraduate Seminar
Seminar for advanced undergraduate students engaged in individual research projects or those who wish to gain an understanding of genetic research by analysis of the primary literature. Assignments emphasize the rationale for research projects and the presentation and interpretation of research findings.

GENOME 496 Peer Teaching Assistants in Genome Sciences
Direct experience in the classroom teaching a discussion section for non-majors in genome sciences courses. Peer teaching assistants attend lectures and weekly preparation meetings and gain in-depth background on the subject material. In addition, peer TAs are given training in teaching techniques and course preparation.

GENOME 499 Undergraduate Research

GENOME 501 Introduction to Research Materials
The student undertakes a research project in one of the research groups within the department for a quarter at a time.

GENOME 520 Seminar

GENOME 525 Current Literature in Human Genetics
Topics from current literature in human genetics. Students and faculty each present one topic per quarter.

GENOME 540 Introduction to Computational Molecular Biology: Genome and Protein Sequence Analysis
Algorithmic and probabilistic methods for analysis of DNA and protein analysis. Students must be able to write computer programs for data analysis. Prior coursework in biology and probability highly desirable.

GENOME 541 Introduction to Computational Molecular Biology: Molecular Evolution
Computational methods for studying molecular evolution. Students must be able to write computer programs for data analysis. Prior coursework in biology and probability highly desirable

GENOME 547 Scientific Writing
For graduate students principally in their second and third year. Focuses on the preparation of research manuscripts for publication. Also considers other scientific writing such as thesis proposals and fellowship and grant applications.

GENOME 549 Molecular Basis of Neurodegenerative Disease
Introduces a broad range of neurodegenerative diseases, focusing upon the approaches that have led to recent discoveries and emphasizing the elucidation of mechanisms and pathways of disease pathogenesis.

GENOME 550 Methods and Logic in Genetics
Critical reading and detailed discussion of genetics-related scientific research papers. Material emphasizes methodological and logical themes of importance in modern genetics, for example: origin of mutants, genetic epistasis, pulse labeling, and in vivo gene function.

GENOME 551 Mechanisms of Gene Regulation in Prokaryotes and Eukaryotes A detailed examination of the mechanisms of transcription and translation in prokaryotes and eukaryotes as determined by experimental genetics, molecular biology and biochemistry.

GENOME 552 Technologies for Genome Analysis
Discussion of current and newly-emerging technologies in genome analysis with regard to applications in biology and medicine and to potential advantages and limitations. Prerequisite: permission of instructor.

GENOME 553 Advanced Genetic Analysis
Classical genetic analysis is a powerful approach to dissect complex biological processes. Selective removal, addition, or alteration of specific proteins to identify and order genes in a pathway, define protein function, determine tissue and temporal requirements for gene function, and distinguish among competing hypotheses to explain biological phenomena.

GENOME 554 Genomic Informatics
Many complete genome sequences are known. Each of these encodes the instructions for making an entire organism, but how can we hope to decipher the code? Focuses on methods for analyzing genome sequences, ranging from large-scale organizational pattern to gene prediction and detailed local alignment methods.

GENOME 555 Protein Technologies
Focuses on current and emerging technologies and approaches in protein analysis, and considers applications of these technologies in biology, biotechnology and medicine.

GENOME 556 Developmental Genetics
Genetic control of early development in a range of organisms, emphasizing systems in which cellular, genetic, and molecular approaches have combined to make significant contributions to understanding.

GENOME 559 Introduction to Statistical and Computational Genomics
Rudiments of statistical and computational genomics. Emphasis on basic probability and statistics, introduction to computer programming, and relevant Web databases.

GENOME 561 Molecular Population Genetics and Evolution
Surveys recent literature to gain an understanding of the basic principles of molecular population genetics and evolution as applied to analysis of genome data. Requires some computer analysis of genome data.

GENOME 562 Population Genetics
Mathematical and experimental approaches to the genetics of natural populations, especially as they relate to evolution. Emphasis on theoretical population genetics. Prerequisite: permission of instructor.

GENOME 570 Phylogenetic Inference
Methods for inferring phylogenies (evolutionary trees) -- biological assumptions, statistical foundations, and computational methods. A comprehensive introduction for graduate students

in the biological sciences to phylogenetic methods using data from molecular sequences, continuous and discrete characters, and gene frequencies.

GENOME 576 Genetic and Genomic Analysis of Bacteria
In-depth coverage of genetic and genomic strategies used to analyze complex biological processes in bacteria. Focuses on general approaches, with examples drawn from studies of pathogenic organisms where possible. A combination of lectures and seminar-style discussions of primary literature.

GENOME 580 Ethics in Biomedical Research and Teaching
Explores ethical issues in research and teaching and discusses avenues of responsible conduct.

GENOME 581 Seminar in Drosophila Genetics
Discussions of contemporary research in and novel methods for genetic, cell biological, and molecular biological analysis of Drosophila development.

GENOME 582 Seminar in Mouse Genetics
Discussion of contemporary research in and novel methods for genetic, cell biological, and molecular analysis of mammalian development, with utilization of transgenic techniques.

GENOME 584 Seminar in DNA Replication
Discussions of contemporary research in and novel methods for genetic, cell biological, and molecular biological analysis of budding yeast, with emphasis on the mechanisms and control of DNA replication.

GENOME 585 Seminar in Bacterial Genetics
Discussions of contemporary research in and novel methods for genetic, cell biological, and molecular biological analysis of bacterial assembly mechanisms, with emphasis on the topogenesis of membrane proteins.

GENOME 586 Seminar in Mammalian Genetics
Discussions of contemporary research in and novel methods for genetic, cell biological, and molecular biological analysis of mammalian genetics, with emphasis on lymphoblast development.

GENOME 587 Seminar in Nematode Genetics
Discussions of contemporary research in and novel methods for genetic, cell biological, and molecular biological analysis of nematode development, with emphasis on neurogenesis and other developmental processes.

GENOME 590 Population Genetics Seminar
Weekly presentation by participants of current literature and ongoing research in evolution, molecular evolution, evolutionary genetics of natural populations, human population genetics, and quantitative genetics applied to animal and plant breeding.

GENOME 599 Special Topics in Molecular Biotechnology

GENOME 600 Independent Study or Research

GENOME 700 Master's Thesis

GENOME 800 Doctoral Dissertation

b. Describe the standards by which you measure your success in achieving your objectives for doctoral program(s). Using these standards, assess the degree to which you have met your objectives. Indicate any factors that

have impeded your ability to meet your objectives and any plans for overcoming these impediments.

Success of our doctoral program is measured in many ways. One criterion is the quality of graduate students whom we are able to recruit into the program. This is assessed by the quality of their undergraduate institution, the student's GPA and GRE, and the percentage of these students who complete the doctoral degree program (see Section G, b1). Once in our program, success is measured by the strong academic record in their coursework, publications in peer-reviewed journals (116 manuscripts have been published by our last 57 graduate students dating back 10 years), and presentations at national and international meetings. We believe we also help our students to become future teachers by requiring that they serve as teaching assistants in two courses, as evidenced by the usually excellent teaching reviews they receive from the student evaluations.

The time-to-degree for our program is approximately 6.4 years, which is similar to other doctoral programs in life sciences here at the UW and at other peer institutions (e.g., UW Pharmacology is ~ 6 years, Biochemistry is 5.8 years, and Neurobiology and Behavior is 6.5 years). We are not pleased with how long it is taking our students to complete their degrees, although we attribute a part of it to a few MBT students who got distracted during the formation of the Institute for Systems Biology. We would like to reduce the time-to-degree to approximately 5 years. To accomplish this we are pushing our students to complete their general examination by no later than the end of the second year and strictly enforcing the requirement of regular meetings with their thesis committee.

Other indices of success are reflected in the quality of the postdoctoral positions our students obtain (see Appendix E). Given the relatively short period that our graduate program has been in existence, we do not yet have data on our graduates' success in finding permanent positions in academia and industry. However, of the 70 graduates (both Ph.D. & M.S.) over the past 10 years, 63% have initially taken positions in academia, 21% have initially taken positions in industry, and 16% have either changed careers (teachers, law, etc.) or are unknown and presumably not involved in science. At least two of these are very recent graduates who have not yet begun looking for a position.

c. How do you inform your students of and prepare them for the breadth of opportunities and career alternatives available within and outside of the academy? This would include careers in industry, for instance, as well as academic careers in institutions other than research-intensive universities.

Our Department initiated a careers seminar more than 15 years ago. At the outset, it was a lunch-time brown bag discussion, but over the years it evolved into a formal series of monthly seminars initially called "What do you do with a PhD", and now called "Bioscience Careers". For the last 5 years or so this has been organized completely by graduate students and is funded by a wide range of Ph.D. graduate programs in the biomedical sciences. The web site is (http://courses.washington.edu/phd/).

We also encourage students to explore opportunities outside the Department. Our students have participated in the "Preparing Future Faculty" program (http://www.preparing-faculty.org/PFFWeb.Contents.htm), and they can apply for the Graduate School Huckabay Fellowships (http://www.grad.washington.edu/pff/huckabay.htm), which emphasize teaching at a variety of levels, especially at community colleges and liberal arts institutions. Our Department is also the University location of the HHMI-sponsored Science Education Partnership (**http://www.onlinelearning.washington.edu/k12guide/resourcepage.asp?ProjID=72**), through which we host secondary school teachers each summer. Graduate students are usually the "hands-on" mentors, providing an opportunity for our students to explore involvement in outreach and secondary education. The Department also provides the option for a student to serve as an intern at a biotech company for a quarter early in his or her career. Since many of our students go on to careers in the biotech industry, this is another avenue for students to explore options outside of academia. Overall, we provide students with a variety of opportunities and encourage them to explore a broad range of career options during their PhD training.

d. How are you staying informed of the career options that graduates of your program typically pursue and the success they are obtaining? How are you using this information in departmental planning?

We poll faculty members for updates on their students as required by our training grants and other reports. While this has worked reasonably well for recent graduates, we plan to begin polling all our graduates directly, to get a more accurate picture of the accomplishments of our graduates as a whole. We keep alumni informed of new developments within the Department by mailing out copies of the Department newsletter, The Genome Scientist, each year.

2. Master's degrees (if applicable, as separate from Doctoral degrees)

All students who enter our program do so with the intention of earning their doctorate. Our Department offers an M.S. in Genome Sciences option for students who have already completed a substantial amount of research and coursework, but are unable or prefer not to continue on in the PhD program. We do not admit new students to the M.S. option.

SECTION G: GRADUATE STUDENTS

1. Recruitment and retention

a. Please describe recruitment/outreach programs to attract graduate students. Describe the measures you use to assess the success of your efforts. How successful have they been?

Our current goal is to admit 8-12 new graduate students each year, depending on available funding, space in labs, and applicant quality. While numbers vary from year to year, we typically receive between 160 and 180 applications for these openings, allowing us to be highly selective in choosing those applicants who appear to be the best match for our program.

We take several steps, including some geared specifically toward underrepresented minority students, to advertise and attract students to our program.

Our website (**www.gs.washington.edu**) has recently been redesigned to be both more attractive and more informative for potential applicants to our program as well as current students. We have received positive feedback from applicants in this regard, particularly in its clarity and ease of navigation. We advertise our program online with GradSchools.com, which consistently comes up very high in our test searches.

We have produced a poster advertising our program, which has been distributed to top liberal arts colleges, historically minority-serving institutions, and major research universities around the country.

In collaboration with other UW Biomedical Ph.D. programs, we have produced a brochure for distribution at graduate fairs.

Genome Sciences attends graduate fairs around the country sponsored by organizations such as ABRCMS (Annual Biomedical Research Conference for Minority Students), SACNAS (Society for the Advancement of Chicanos and Native Americans in Science), and AISES (American Indian Science and Engineering Society). Recent examples of conferences our representatives have attended included 2004 SACNAS (Austin, TX); 2004 AISES (Anchorage, AK); and 2005 ABRCMS (Atlanta, GA). We expect to participate in 2 or more conferences of this sort every year, including 2006 SACNAS (Tampa, FL) and 2006 ABRCMS (Anaheim, CA) this fall.

A similar effort we are exploring is to attend at least one graduate fair located at a top research university each year. We will send a representative to UC Berkeley's graduate fair this year and, if the results are positive, in future years we will attend grad fairs at UC Los Angeles, UC San Diego, and other west coast institutions.

Finally, one of the most effective ways by which we have recruited outstanding graduate students is from referrals by our alumni and others who are aware of the high quality of our research and teaching.

We assess our efforts by the sizes of our applicant pools and our incoming classes. Particularly in the latter area, we have been pleased with our results:

2003 – 8 students (goal of 10)
2004 – 13 students (goal of 12)
2005 – 14 students (goal of 12)
2006 – 10 students (goal of 9)

Our applicant pools have declined from a high of 240 applicants in 2003 (an unusually high number of applications for our program) to 160 in 2006. We believe an optimal number would be approximately 180-190 and are confident our expanded efforts, including poster distribution and attending a west coast graduate fair each year, will help raise the overall number of applicants to the desired level.

Those applicants selected as finalists for admission to our program (typically between 30 – 35 in a given year) are invited to visit our Department to meet faculty and students and find out for themselves whether or not our program is the best match for their research interests. We pay all expenses, including airfare, single hotel accommodation and all meals. Special events include a dinner hosted by our graduate students and another held at the home of a faculty member.

We poll our visitors each year after all admissions decisions have been made. Our visitors, regardless of whether or not they ultimately choose our program, consistently and uniformly praise the friendliness and helpfulness of our students and faculty, the ease and effectiveness of the visit, and their overall experience here relative to other programs they visit.

b. What are your retention rates for master's and doctoral programs? To what do you attribute attrition? What steps are taken to minimize attrition?

	# of Ph.Ds awarded	# of M.S. awarded	# who left program or transferred to another department
2006	5	2	0
2005	7	1	0
2004	10	2	0
2003	8	1	2
2002	2	0	1
2001	7	1	0

Our goal is that every student who enters our program will leave the Department having earned their doctorate. Over the last 5 years since the Department was founded, 79% of students who left our Department did so with a Ph.D. During this timeframe, 94% have left with an advanced degree (Ph.D. or M.S.).

As stated previously in section E3, the primary reason we have had good success in retaining students is that our Departmental culture has traditionally been very

collaborative and supportive. Students and faculty from different labs and different UW departments collaborate extensively on research projects. Our Department has several weekly events – Genome Sciences Seminars, ComBi Seminars, Journal Club, and Research Reports, among others – which are very well attended by faculty and students. The Department also sponsors an annual retreat and weekly social gatherings, which further facilitate the supportive atmosphere our faculty and students have come to expect.

2. Advising, Mentoring and Professional Development

a. In what ways do you communicate academic program expectations to students? Such information should include: timelines, phases and benchmarks of the degree program; procedures for committee formation; coursework, exam and presentation requirements; and standards of scholarly integrity.

Our website provides an online student handbook listing all program requirements, procedural instructions, and other topics of interest to graduate students (e.g., links to housing, transportation, and area recreational resources). This information is available sorted by year in the program as well as alphabetically: (**http://www.gs.washington.edu/academics/gradprogram/handbook/index.htm**).

In addition, students receive emails from the (GPA) graduate program assistant (staff member) and the (GPC) graduate program coordinator (faculty member, **Dr. Colin Manoil**) to alert them to any upcoming requirements. They are always welcome to meet in person with both the grad program assistant and the grad program coordinator – and often do – to discuss any questions or concerns they may have.

b. In what ways do you inform students of your unit's graduation and placement record? Such information should include time to degree; average completion rates (Master's and Ph.D.); and employment of graduates two and five years after degree completion.

Our Department website has an "Alumni" section, listing every recent graduate from the Department, the degree earned, and their last known position.

c. Please attach an example of your departmental mentoring/advising plan. Such information should include evidence that each students' work and progress are being evaluated on at least an annual basis and that the results of the evaluation are communicated to the student.

Our Department website provides comprehensive information on program requirements and timelines. In addition, new students meet individually with the faculty Graduate Program Coordinator (to discuss research goals and set up rotations) and the staff Graduate Program Assistant (to go over program requirements, how to register, etc). All students are always welcome to meet with the GPC or GPA anytime needed.

Student progress is reviewed annually by the entire faculty at a designated meeting. Students are also required to meet with their supervisory committee at least once per year (twice is encouraged). A formal written report is generated after the supervisory committee meeting, documenting progress and committee requests or suggestions. The student and Department each receive a copy of this report. Additionally, all students in their second year or beyond are required to present their research annually to the Department as part of the Research Reports sessions, which prompts feedback from faculty members.

In addition to providing informal feedback throughout the quarter, faculty members who have first-year students rotating in their labs complete a detailed evaluation form at the end of each quarter. This is used during the annual student progress meeting to evaluate performance. First-year students receive verbal and / or written feedback from the GPC after this meeting. As a further means of evaluating first-year performance, the Department has decided to implement first-year rotation presentations to the Department each quarter.

d. Please attach a copy of your professional development plan. Such a plan should address questions such as: "What are the career opportunities for a master's or Ph.D. graduate in your field?" "What skills/experiences contribute to success in the various academic and non academic career paths listed above?"

In addition to mentoring provided formally by the thesis advisor, supervisory committee members, and informally by other faculty members, Genome Sciences helps sponsor the Biosciences Career seminar series (**http://courses.washington.edu/phd/**), which explores non-academic career

paths for those who have earned an advanced degree in a biomedical field. This helps to ensure that students are aware of the many available career options available.

3. Inclusion in governance and decisions

a. In what ways do you include graduate students in the governance of your department?

Our graduate students take active, important roles in many areas of Departmental governance. These include student recruiting, where four students serve as hosts during our program visits, participating in the summer outreach to educators, assisting with Teaching Assistant course assignments, helping select seminar speakers (at least one seminar date each quarter is reserved for a student-selected speaker), serving as liaisons between faculty and students by attending faculty meetings, serving in the Graduate Student Senate, and planning social functions such as the annual student Welcome Back Barbecue and the annual Department Holiday Party.

Whether in assigned roles such as these or in less formal ways, student ideas continually improve our graduate program and Departmental functions. For example, our graduate applicant visits have been improved significantly as a result of ideas presented by our student recruiting coordinators, helping us to remain competitive with other top programs.

b. Please describe your grievance process and characterize the nature of any grievances that have been lodged over the past 3 years. If the characterization is likely to reveal any students' identities, please address this issue in a separate but accompanying document addressed to the Dean of the Graduate School.

Our Department has had few major grievances, due in part to careful monitoring of student progress (so that minor problems are generally caught and resolved quickly) and the traditionally supportive departmental culture.

When problems do arise, students and faculty mentors are often able to resolve these between themselves, with the help of the supervisory committee if necessary. Problems that cannot be resolved at this level move to the Graduate Program

Coordinator, who in the few situations of this sort has generally been able to broker an acceptable resolution for all parties.

Our students, regardless of the source of financial support, are all union members. Although this has yet to happen, any situation that could not be resolved as stated above would move to union mediation.

A specific example of a grievance within the past 3 years involved a student who had been advised by his mentor that he should leave the program with a terminal Master's degree due to failure to make sufficient research progress, an assessment with which the student strongly disagreed. With the help of the student's supervisory committee and the Graduate Program Coordinator, a compromise was mapped out, setting specific research goals and reasonable deadlines for meeting each. This student has since graduated with his Ph.D. Few conflicts reach this stage, but for those rare instances when this happens, fairness, flexibility, and clearly stated requirements resolve the issue.

4. For graduate student service appointees, please describe:

a. Appointment process.

The Department has two training grants that provide support to most students during their first two years in our program. Faculty review committees assigned to each training grant (**Genetics Training Grant, PI – James Thomas**; **Genome Training Grant, PI – Stanley Fields**) review each student's research background and progress to ensure they are matched with the appropriate grant.

International students and US citizens beyond their first two years in the program have Research Assistant fellowships provided by either their mentor or general Departmental funds.

All students in good academic standing receive full funding from one of these sources.

b. Average duration of appointment.

Subject to adequate research progress, all students in the program receive full funding for the duration of their studies here, typically between 5 and 6 years.

c. Mix of funding among the various appointments (teaching, research and staff assistantships, fellowships, traineeships).

Students are generally supported as either stipend trainees (training grants) or research assistants (research funds of their mentors). Some apply for and are awarded independent fellowships. Regardless of their funding source, all students have the same TA requirements.

d. What criteria do you use for promotions and salary increases?

The School of Medicine sets a standard salary level (currently $25,008 annually) for all doctoral students, regardless of their year in the program. This salary is higher than other graduate student positions at the UW and is very competitive with funding offered by other top programs.

e. In what ways are graduate student service appointees supervised?

N/A

f. What training do graduate student service appointees receive to prepare them for their specific role?

Faculty members train students for the specific responsibilities allocated to them in their labs. All students also receive general laboratory safety training (including managing hazardous chemicals and fire extinguisher training) upon beginning our program. Those whose research requires it also receive radiation safety training or human subjects training.

Appendix A

Graduate Student Statistical Summary (10-year data)

Graduate Student Statistical Summary * The Graduate School * University of Washington Printed: 09-Nov-05

Genome Sciences

Y	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Autumn Quarter Enrollment										
Enrollment History										
Total	46	46	48	47	50	47	48	48	46	52
Full-Time	42	45	48	46	47	43	48	48	46	51
Part-Time	4	1	0	1	3	4	0	0	0	1
Male	20	21	21	19	23	23	24	24	28	33
Female	26	25	27	28	27	24	24	24	18	19
Ethnic Minority	7	7	6	7	7	7	10	9	11	12
International	4	5	5	3	3	4	4	5	7	8
Wash. Resident	20	15	14	13	18	16	23	23	23	25
Non-Resident	26	31	34	34	32	31	25	25	23	27
New Student Enrollment	10	7	10	6	9	5	5	6	9	12
Continuing	36	39	38	41	41	42	43	42	37	40
Annual Applications (Sum-Spr qtrs)	35	33	48	60	119	102	172	229	179	
Autumn Quarter Application	35	32	47	60	119	101	171	228	178	168
Autumn Quarter Denials	18	17	26	25	94	48	140	193	146	138
Autumn Quarter Offers	12	10	19	21	22	15	29	30	27	30
Autumn Quarter Percentages										
% Denied (of Applications)	51.4%	53.1%	55.3%	41.7%	79.0%	47.5%	81.9%	84.6%	82.0%	82.1%
% Offers (of Applications)	34.3%	31.3%	40.4%	35.0%	18.5%	14.9%	17.0%	13.2%	15.2%	17.9%
% New Enrollees (of Apps)	28.6%	21.9%	21.3%	10.0%	7.6%	5.0%	2.9%	2.6%	5.1%	7.1%
% New Enrollees (of Offers)	83.3%	70.0%	52.6%	28.6%	40.9%	33.3%	17.2%	20.0%	33.3%	40.0%
Autumn Minority Admissions										
Applications	4	10	7	12	15	12	15	27	24	24
Denials	1	6	3	5	12	4	11	24	17	19
Offers	1	3	4	4	2	2	4	3	7	5
Autumn International Admissions										
Applications	7	5	9	9	54	46	63	92	57	52
Denials	5	4	9	8	52	31	60	85	52	50
Offers	0	1	0	0	1	2	2	3	3	2
Applicant Average GPA										
Denied	3.17	3.27	3.30	3.23	3.46	3.51	3.45	3.54	3.49	3.58
Accepted But Not Enrolled	3.33	3.56	3.48	3.53	3.63	3.41	3.66	3.76	3.72	3.67
Accepted and Enrolled	3.70	3.52	3.48	3.55	3.61	3.41	3.79	3.66	3.68	3.52
Applicant Average GRE Scores										
Denied										
Verbal Score	503	477	577	528	503	537	534	549	524	549
Quantitative Score	663	669	706	695	723	732	701	711	724	732
Analytical Score	639	616	660	667	667	682	694	688	668	649
Accepted But Not Enrolled										
Verbal Score	560	575	619	632	607	636	627	643	612	625
Quantitative Score	640	737	729	733	738	746	768	772	764	759
Analytical Scor	610	706	708	730	747	759	740	741	745	710
Accepted and Enrolled										
Verbal Score	657	583	591	638	609	580	622	648	618	618
Quantitative Score	756	740	717	730	726	673	786	760	768	749
Analytical Score	735	745	700	700	746	727	706	734	720	
Annual Degrees Awarded (Sum-Spr qtrs)										
Masters:	3	2	1	1		1		2	1	
Doctoral:	11	6	8	5	4	9	2	9	9	
Ph.D. Candidates:	2	9	5	8	11	11	10	4	14	
Autumn Quarter Financial Support										
Teaching Assistants	0	0	0	0	10	0	0	0	0	
Research Assistants	20	21	20	21	27	25	43	43	43	47
Fellowships	4	3	13	7	6	3	0	1	0	1
Traineeships	35	42	51	44	35	41	24	21	18	27

Appendix B

Academic Unit Profile

FY2006 METER
Quarterly Reporting Template

DEPARTMENT OF GENOME SCIENCES

COMBINED INCOME STATEMENT

										12	# of months YTD		
	Budget					Actual				Year-to-date			
	Annual	Q1 Jul-Sep	Q2 Oct-Dec	Q3 Jan-Mar	Q4 Apr-Jun	Q1 Jul-Sep	Q2 Oct-Dec	Q3 Jan-Mar	Q4 Apr-Jun	Actual	Budget	$ Var	% Var
Fund sources - cash inflows:													
State-general operating funds (GOF)	$3,394,159	$848,540	$848,540	$848,540	$848,540	$462,627	$456,203	$654,489	$507,125	$2,080,444	$3,394,159	($1,313,715)	(38.7%)
State-designated operating funds (DOF)	419,302	104,826	104,826	104,826	104,826	0	420,233	(932)	(600)	418,701	$419,302	($601)	(0.1%)
State-WWAMI	0	0	0	0	0	0	0	0	0	0	$0	$0	-
Research Cost Recovery (RCR)	737,244	184,311	184,311	184,311	184,311	184,311	184,311	184,311	184,311	737,244	$737,244	$0	0.0%
Grants & Contracts	15,466,233	3,866,558	3,866,558	3,866,558	3,866,558	3,153,241	4,510,746	3,977,976	3,824,270	15,466,233	$15,466,233	$0	0.0%
Gifts & Operating Endowments	888,807	222,202	222,202	222,202	222,202	188,878	173,569	209,340	316,960	888,747	$888,807	($60)	(0.0%)
R&T-Other UW funding/Dean's VC	324,016	81,004	81,004	81,004	81,004	81,004	81,004	81,004	81,004	324,016	$324,016	$0	0.0%
Total income/available funds	**$21,229,761**	**$5,307,440**	**$5,307,440**	**$5,307,440**	**$5,307,440**	**$4,070,061**	**$5,826,066**	**$5,106,188**	**$4,913,070**	**$19,915,385**	**$21,229,761**	**($1,314,376)**	**(6.2%)**
Fund uses - cash outflows:													
Faculty salaries & benefits	$4,253,822	$1,063,456	$1,063,456	$1,063,456	$1,063,456	$966,623	$957,645	$966,687	$1,011,928	$3,902,883	$4,253,822	($350,939)	(8.2%)
Staff salaries & benefits	6,601,147	1,650,287	1,650,287	1,650,287	1,650,287	1,666,943	1,904,364	1,836,785	1,772,562	7,180,654	$6,601,147	$579,507	8.8%
Operations	10,054,610	2,513,653	2,513,653	2,513,653	2,513,653	1,454,359	2,447,989	2,110,734	2,056,466	8,069,548	$10,054,610	($1,985,062)	(19.7%)
Other expenses (1)	0	0	0	0	0	0	420,233	(932)	(600)	418,701	$0	$418,701	-
Tsf to/from other dept (2)	0	0	0	0	0	0	0	0	0	0	$0	$0	-
Total expenses	**$20,909,579**	**$5,227,395**	**$5,227,395**	**$5,227,395**	**$5,227,395**	**$4,087,925**	**$5,730,231**	**$4,913,274**	**$4,840,356**	**$19,571,786**	**$20,909,579**	**($1,337,793)**	**(6.4%)**
													-
Net cash inflow/outflow	**$320,182**	**$80,046**	**$80,046**	**$80,046**	**$80,046**	**($17,864)**	**$95,835**	**$192,914**	**$72,714**	**$343,599**	**$320,182**	**$23,417**	**7.3%**
Reconciliation of contributions by fund source:													
State-general operating funds (GOF)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	-
State-designated operating funds (DOF)	0	0	0	0	0	0	0	0	0	0	0	0	-
State-WWAMI	0	0	0	0	0	0	0	0	0	0	0	0	-
Research Cost Recovery (RCR)	70,244	17,561	17,561	17,561	17,561	(74,761)	22,803	136,813	8,806	93,661	70,244	23,417	33.3%
Grants & Contracts	0	0	0	0	0	0	0	0	0	0	0	0	-
Gifts & Operating Endowments	0	0	0	0	0	0	0	0	0	0	0	0	-
R&T	249,938	62,485	62,485	62,485	62,485	56,897	73,032	56,101	63,908	249,938	249,938	0	0.0%
Total	**$320,182**	**$80,046**	**$80,046**	**$80,046**	**$80,046**	**($17,864)**	**$95,835**	**$192,914**	**$72,714**	**$343,599**	**$320,182**	**$23,417**	**7.3%**

Genome Sciences
Brian Giebel
Autumn 2006

Exit Questionnaire Summary: Genome Sciences

| GSFEI | Exit Questionnaire Report | Completion and Doctoral Time-To-Degree Reports | Graduate Degree Unit Directory |

| View Applicants | View Grad Students | View Faculty | View Admin | Main Page | Help | End Session |

To run the report, select a time period and a degree level from the options below:

Summer 2002 - Spring 2003 | Ph.D. Students | (All Majors in Genome Sciences)* | Run Report

*You may optionally designate a specific major/pathway within the department.

[Print-friendly version]

Exit Questionnaire Summary Report
Summer 2002 - Spring 2003
Ph.D Students

Genome Sciences	Academic Unit		School/College		University	
Average Ratings (scale of 1 to 5, 5 being highest)	Average	St. Dev	Average	St. Dev	Average	St. Dev
Rating of departmental academic standards	4.33	0.58	4.06	0.86	4.19	0.8
Response of recent developments or trends	3.67	0.58	4.15	0.76	4.24	0.82
Adequacy of research and professional training	4	0	4.06	0.7	4.04	0.94
Adequacy of space, facilities, and equipment	3	1	3.94	0.97	3.53	1.08
Satisfaction with supervision and/or guidance	3.33	1.15	3.73	1.07	4.11	0.98
Confidence in preparation for teaching	3.67	0.58	3.17	1.05	3.48	1.08
Adequacy of teaching preparation for students	4.33	0.58	3.89	0.8	4.09	0.86
Quality of the faculty	4	0	4.31	0.69	4.38	0.73
Satisfaction with career mentoring	3.33	1.15	3.45	1.2	3.61	1.16
Confidence as an independent scholar/researcher in field	4	0	4.03	0.53	4.18	0.71
Overall quality of the program	4	0	4.15	0.51	4.16	0.72
Percent who had a paper published in a journal while in the program	33.33%		90.91%		70.85%	
Percent who are publishing based on thesis or dissertation	100.00%		100.00%		95.03%	
Average Number of Papers Published	2		2.3		2.9	
Percent incurring no debt to finance education	100.00%		60.61%		51.99%	
Under $5,000	0.00%		0.00%		5.75%	

$5,000-10,000	0.00%		9.09%		9.96%	
$10,001-20,000	0.00%		12.12%		6.64%	
Above $20,000	0.00%		6.06%		14.16%	
Teaching Experience at U of W						
Served as grader and/or tutor	100.00%		42.42%		40.71%	
Taught laboratory/quiz sections	66.67%		72.73%		61.95%	
Taught own class			12.12%		33.85%	
Other			9.09%		11.73%	
Immediate Post-graduation Plans						
Further graduate study	0.00%		3.23%		0.45%	
Postdoctoral fellowship or research associateship	100.00%		70.97%		38.65%	
Governmental employment	0.00%		0.00%		4.27%	
Self-employment	0.00%		0.00%		5.62%	
Business/industrial employment	0.00%		16.13%		13.48%	
Research University	0.00%		3.23%		15.51%	
Comprehensive university or college	0.00%		3.23%		9.44%	
Liberal arts college	0.00%		3.23%		5.39%	
Community college	0.00%		0.00%		1.80%	
School (K-12)	0.00%		0.00%		0.67%	
Not seeking employment or further formal education	0.00%		0.00%		0.67%	
Other	0.00%		0.00%		4.04%	
Percentage having secured a position	33.33%		67.74%		75.29%	
Secured position preference (first choice)	100.00%		95.24%		88.62%	
Secured position preference (second choice)	0.00%		4.76%		8.38%	
Secured position preference (third choice)	0.00%		0.00%		2.99%	
Percentage indicating the position is in Washington State	0.00%		47.62%		39.27%	
Number of Respondents	**3**		**33**		**452**	

*Notes:

1. All figures are calculated based on the number of responses received, not the number of graduates for the reporting period.
2. Standard deviation (St. Dev) is calculated using the population method.
3. Columns with values of "N/A" are shown when the number of total respondents is equal to one (1).

Results as of 10/2/2006

| Help | End Session |

Genome Sciences
Brian Giebel
Autumn 2006

Exit Questionnaire Summary: Genome Sciences

| GSFEI | Exit Questionnaire Report | Completion and Doctoral Time-To-Degree Reports | Graduate Degree Unit Directory |

| View Applicants | View Grad Students | View Faculty | View Admin | Main Page | Help | End Session |

To run the report, select a time period and a degree level from the options below:

Summer 2003 - Spring 2004 | Ph.D. Students | (All Majors in Genome Sciences)* | Run Report

*You may optionally designate a specific major/pathway within the department.

[Print-friendly version]

Exit Questionnaire Summary Report
Summer 2003 - Spring 2004
Ph.D Students

Genome Sciences	Academic Unit		School/College		University	
Average Ratings (scale of 1 to 5, 5 being highest)	Average	St. Dev	Average	St. Dev	Average	St. Dev
Rating of departmental academic standards	4	0.53	4.27	0.72	4.23	0.75
Response of recent developments or trends	4.63	0.52	4.55	0.83	4.27	0.85
Adequacy of research and professional training	4.25	0.89	4.42	0.71	4.14	0.91
Adequacy of space, facilities, and equipment	3.5	1.41	4.15	1.06	3.6	1.08
Satisfaction with supervision and/or guidance	4	1.07	4.06	1.06	4.19	1
Confidence in preparation for teaching	3.38	0.92	3.58	1.12	3.66	1.02
Adequacy of teaching preparation for students	4	1.22	4	0.89	4.14	0.81
Quality of the faculty	4.5	0.53	4.64	0.55	4.44	0.72
Satisfaction with career mentoring	3.63	1.41	3.52	1.28	3.7	1.12
Confidence as an independent scholar/researcher in field	4.25	1.04	4.42	0.75	4.24	0.69
Overall quality of the program	4.14	0.69	4.31	0.74	4.18	0.73
Percent who had a paper published in a journal while in the program	87.50%		90.91%		69.05%	
Percent who are publishing based on thesis or dissertation	100.00%		90.00%		96.03%	
Average Number of Papers Published	2.1		2.4		2.8	
Percent incurring no debt to finance education	75.00%		57.58%		47.32%	
Under $5,000	0.00%		6.06%		8.35%	

$5,000-10,000	0.00%		18.18%		8.99%	
$10,001-20,000	12.50%		12.12%		10.92%	
Above $20,000	0.00%		0.00%		11.99%	
Teaching Experience at U of W						
Served as grader and/or tutor	37.50%		36.36%		40.69%	
Taught laboratory/quiz sections	62.50%		63.64%		61.24%	
Taught own class			12.12%		36.62%	
Other	12.50%		21.21%		11.99%	
Immediate Post-graduation Plans						
Further graduate study	0.00%		3.13%		0.87%	
Postdoctoral fellowship or research associateship	62.50%		78.13%		37.53%	
Governmental employment	0.00%		3.13%		2.82%	
Self-employment	0.00%		0.00%		1.30%	
Business/industrial employment	0.00%		0.00%		13.45%	
Research University	25.00%		9.38%		18.87%	
Comprehensive university or college	0.00%		0.00%		10.85%	
Liberal arts college	0.00%		0.00%		4.77%	
Community college	0.00%		0.00%		2.17%	
School (K-12)	0.00%		0.00%		1.08%	
Not seeking employment or further formal education	12.50%		6.25%		2.17%	
Other	0.00%		0.00%		4.12%	
Percentage having secured a position	42.86%		58.06%		72.95%	
Secured position preference (first choice)	100.00%		94.74%		85.24%	
Secured position preference (second choice)	0.00%		5.26%		12.35%	
Secured position preference (third choice)	0.00%		0.00%		2.41%	
Percentage indicating the position is in Washington State	25.00%		42.11%		37.43%	
Number of Respondents	**8**		**33**		**467**	

*Notes:

1. All figures are calculated based on the number of responses received, not the number of graduates for the reporting period.
2. Standard deviation (St. Dev) is calculated using the population method.
3. Columns with values of "N/A" are shown when the number of total respondents is equal to one (1).

Results as of 10/2/2006

| Help | End Session |

Genome Sciences
Brian Giebel
Autumn 2006

Exit Questionnaire Summary: Genome Sciences

| GSFEI | Exit Questionnaire Report | Completion and Doctoral Time-To-Degree Reports | Graduate Degree Unit Directory |

| View Applicants | View Grad Students | View Faculty | View Admin | Main Page | Help | End Session |

To run the report, select a time period and a degree level from the options below:

Summer 2004 - Spring 2005 | Ph.D. Students | (All Majors in Genome Sciences)* | Run Report

*You may optionally designate a specific major/pathway within the department.

[Print-friendly version]

Exit Questionnaire Summary Report
Summer 2004 - Spring 2005
Ph.D Students

Genome Sciences	Academic Unit		School/College		University	
Average Ratings (scale of 1 to 5, 5 being highest)	Average	St. Dev	Average	St. Dev	Average	St. Dev
Rating of departmental academic standards	3.67	0.52	4.18	0.62	4.28	0.68
Response of recent developments or trends	4.83	0.41	4.5	0.59	4.35	0.8
Adequacy of research and professional training	4.33	0.52	4.25	0.61	4.11	0.9
Adequacy of space, facilities, and equipment	3.33	1.37	3.68	1.14	3.69	1.04
Satisfaction with supervision and/or guidance	4	1.1	4.2	0.85	4.16	1.02
Confidence in preparation for teaching	3.83	0.75	3.19	0.89	3.6	1.09
Adequacy of teaching preparation for students	4.5	0.71	3.89	0.89	4.13	0.85
Quality of the faculty	4.67	0.52	4.47	0.55	4.43	0.67
Satisfaction with career mentoring	3.33	1.63	3.68	1.12	3.7	1.19
Confidence as an independent scholar/researcher in field	4.5	0.84	4.2	0.59	4.18	0.71
Overall quality of the program	4.33	0.82	4.16	0.48	4.21	0.75
Percent who had a paper published in a journal while in the program	66.67%		55.81%		64.82%	
Percent who are publishing based on thesis or dissertation	100.00%		71.43%		94.67%	
Average Number of Papers Published	3.3		2.6		2.7	
Percent incurring no debt to finance education	50.00%		45.45%		46.77%	
Under $5,000	16.67%		2.27%		6.03%	

$5,000-10,000	33.33%		11.36%		11.21%	
$10,001-20,000	0.00%		15.91%		7.76%	
Above $20,000	0.00%		13.64%		16.81%	
Teaching Experience at U of W						
Served as grader and/or tutor	50.00%		25.00%		42.89%	
Taught laboratory/quiz sections	83.33%		52.27%		56.90%	
Taught own class			4.55%		31.03%	
Other	16.67%		15.91%		15.73%	
Immediate Post-graduation Plans						
Further graduate study	0.00%		0.00%		0.66%	
Postdoctoral fellowship or research associateship	66.67%		51.16%		33.04%	
Governmental employment	0.00%		0.00%		5.03%	
Self-employment	0.00%		0.00%		0.88%	
Business/industrial employment	16.67%		30.23%		18.16%	
Research University	16.67%		2.33%		16.85%	
Comprehensive university or college	0.00%		0.00%		8.97%	
Liberal arts college	0.00%		0.00%		6.56%	
Community college	0.00%		2.33%		1.31%	
School (K-12)	0.00%		2.33%		2.63%	
Not seeking employment or further formal education	0.00%		0.00%		1.09%	
Other	0.00%		11.63%		4.81%	
Percentage having secured a position	66.67%		71.43%		74.89%	
Secured position preference (first choice)	100.00%		96.77%		88.10%	
Secured position preference (second choice)	0.00%		3.23%		9.82%	
Secured position preference (third choice)	0.00%		0.00%		2.08%	
Percentage indicating the position is in Washington State	75.00%		67.74%		41.79%	
Number of Respondents	**6**		**44**		**464**	

*Notes:

1. All figures are calculated based on the number of responses received, not the number of graduates for the reporting period.
2. Standard deviation (St. Dev) is calculated using the population method.
3. Columns with values of "N/A" are shown when the number of total respondents is equal to one (1).

Results as of 10/2/2006

| Help | End Session |

Appendix C

List of special pathways, options, certificates, etc. within degree

There are no special options within the Genome Sciences Ph.D. program itself.

In some cases our students and faculty do participate in outside programs, specifically the Computational Molecular Biology program. The Genome Sciences Ph.D. program is affiliated with other outside programs (Nanotechnology Ph.D., Astrobiology certificate, Molecular Medicine certificate), but none of our students have enrolled to date.

Students who joined the program via one of our parent departments earn their Ph.D. in either Genetics or Molecular Biotechnology. Since 2002, all new students have been admitted to the Genome Sciences Ph.D. program.

Appendix D

List of faculty by rank; include list of dissertation committees chaired for past five years

Name	Title	Appointment	Dissertation Committees Chaired past 5 years
Berg, Celeste	Professor	Primary	Michael Boyle Jennie Dorman Rachel French Karen James David Tran
Braun, Robert	Professor	Primary	Frank Buaas Stephen Eacker Flaviano Giorgini Robert Holdcraft Benjamin Smith (current GS student) Tm White
Brewer, Bonita	Professor	Primary	Christina Buchanan Sonia Hunt Russell Lo Heather McCune
Byers, Breck	Professor	Primary	None
Felsenstein, Joseph	Professor	Primary	Lindsey Dubb Chul Joo Kang (current GS student)
Fields, Stanley	Professor	Primary	Carlos Araya (current GS student) Ross Centers (current GS student) Mara Jeffress John Miller Ralph Powers Kevin Schultz
Green, Philip	Professor	Primary	Daehyun Baek Kavita Garg Dick Hwang Graham McVicker (current GS student) Robert Robinson Christopher Saunders (current GS student) David Tabb
Manoil, Colin	Professor	Primary	Nicole Benkers Mark Enstrom (current GS student) Larry Gallagher Aaron Hinz Iyarit Thaipisuttikul
Nickerson, Deborah	Professor	Primary	Tushar Bangale Cindy Desmarais (current GS student) Rachel Mackelprang (current GS student) Troy Zerr (current GS student)
Sibley, Carol	Professor	Primary	Laura Certain (current GS student) A'Lissa Gerum Michele Hastings Vivian Hawkins

			Jonathan Ulmer (current GS student)
Thomas, James	Professor	Primary	Allyson McCormick (current GS student) Joshua McElwee Elaine Round Monika Tzoneva Jeanna Wheeler
Trask, Barbara	Professor	Primary	Jennifer Allen Jennifer Gogarten (current GS student) Ilona Holcomb (current GS student) Elena Linardopoulou Heather Mefford Tera Newman Edward Ramos
Waterston, Robert	Professor and Chair	Primary	Max Boeck (current GS student) Matthew Sandel (current GS student)
Hall, Benjamin	Professor	Joint (w/ Biology)	Amy Carlile Andrew Eckert Jie Luo Anne Mullenniex
King, Mary-Claire	Professor	Joint (w/ Medicine)	Dan Black Karen Chisholm (current GS student) Diane Dickel (current GS student) Laura Flinn Rachel Gonzalez Kristen Lewis (current GS student) Leonard Lipovich
Miller, Samuel	Professor	Joint (w/ Microbiology & Medicine)	Sara Selgrade (current GS student)
Monnat, Raymond	Professor	Joint (w/ Pathology)	Joseph Bavaro Brett Chevalier Kiranjit Dhillon (current GS student) Jennifer Eklund Umut Ulge Elijah Wallace
Olson, Maynard	Professor	Joint (w/ Medicine)	Kerry Bubb Charla Lambert (current GS student) Eric Smith Erin Smith David Spencer (current GS student)
Eichler, Evan	Associate Professor	Primary	Jonathan Bleyhl Zhaoshi Jiang (current GS student)
Noble, William	Associate Professor	Primary	Aaron Klammer (current GS student) Tobias Mann (current GS student)
Pallanck, Leo	Associate Professor	Primary	Michael Babcock Megan Fluegel Jessica Golby Angela Poole (current GS student) Terrence Satterfield Stephen Voght (current GS student)

			Jessica Greene Zuniga
Akey, Joshua	Assistant Professor	Primary	Shameek Biswas (current GS student) Thomas Nicholas (current GS student) James Ronald (current GS student)
MacCoss, Michael	Assistant Professor	Primary	Gregory Finney (current GS student) Michael Hoopmann (current GS student) Aaron Klammer (current GS student)
Stamatoyannopoulos, John	Assistant Professor	Primary	None
Swanson, Willie	Assistant Professor	Primary	Nathaniel Clark (current GS student) Geoffrey Findlay (current GS student) Joanna Kelley (current GS student) Stevan Springer
Furlong, Clem	Research Professor	Joint	None
Abkowitz, Janis	Professor	Adjunct	None
Baker, David	Professor	Adjunct	Eric Alm Justin Ashworth Divya Bhat (current GS student) Richard Bonneau Gong Cheng Dylan Chivian Gautam Dantas Lin Jiang Lukacz Joachimiak Jacob Kennedy Alexandre Morozov Paul Murphy Sehat Nauli Michelle Scalley-Kim William Sheffler (current GS student) James Thompson (current GS student) Chu Wang Alexander Watters
Bamshad, Michael	Professor	Adjunct	Reha Toydemir
Blau, Carl Anthony	Professor	Adjunct	None
Byers, Peter	Professor	Adjunct	Helena Telfer Ernesto Valiente-Rivera
Horwitz, Marshall	Professor	Adjunct	Richard Person Stephen Salipante (current GS student)
Jarvik, Gail	Professor	Adjunct	Cara Carty
Palmiter, Richard	Professor	Adjunct	Carrie Heusner Thomas Hnasko Douglas Kim Shane Kruse Francisco Perez

			Siobhan Robinson Linda Ste. Marie Lisa Beutler (current GS student)
Raskind, Wendy	Professor	Adjunct	None
Ruzzo, Walter L	Professor	Adjunct	Agatha Liu Zasha Weinberg Zizhen Yao Ka Yee Yeung-Rhee
Thompson, Elizabeth	Professor	Adjunct	Amy Anderson Saonli Basu Arindam Roy Choudhury Sijian Je Anne-Louise Leutenegger Na Li Solveig Sieberts William Stewart
Tompa, Martin	Professor	Adjunct	Mathieu Blanchette Nan Li Amol Prakash Emily Rocke Saurabh Sinha
Wakimoto, Barbara	Professor	Adjunct	Michelle Fisher Jiro Yasuhara
Weir, Bruce	Professor	Adjunct	Rorianne Rohlfs (current GS student)
Wijsman, Ellen	Research Professor	Adjunct	Elisabeth Rosenthal
Gottschling, Daniel	Professor	Affiliate	Marguerite Anderson Lazar Dimitrov (current GS student) Michael McMurray Gary Oertli Joshua Veatch
Nelson, Peter	Associate Professor	Adjunct	Daniella Bianchi-Frias Michael Bonham Chung-Ying Huang (current GS student) Brigham Mecham (current GS student) Colin Pritchard Cynthia Sprenger
Raible, David	Associate Professor	Adjunct	Kevin Curran Kelly Grant Jessica Lewis Eva Ma Hillary McGraw Jared Ragland Josette Ungos Nick Coley (current GS student)
Storey, John	Assistant Professor	Adjunct	Alan Dabney
Malik, Harmit	Assistant Professor	Affiliate	Joshua Bayes Benjamin Wiggins

Deeb, Samir	Research Professor	Adjunct	
Gallant, Jonathan	Professor Emeritus	Primary	None
Gartler, Stanley	Professor Emeritus	Joint (w/ Medicine)	None
Kuhner, Mary	Research Associate Professor	Primary	Not endorsed to chair doctoral committees
Raghuraman, Mosur	Research Assistant Professor	Primary	Not endorsed to chair doctoral committees
Rieder, Mark	Research Assistant Professor	Primary	Not endorsed to chair doctoral committees
Schivell, Amanda	Lecturer	Primary	Not endorsed to chair doctoral committees

Appendix E

Placement of graduates, last 3 years

Former Student / Degree	Current Position
Babcock, Michael Genetics Ph.D., 2004	Associate Scientist, Elan Pharmaceuticals
Bavaro, Joseph Brad Genetics M.S., 2005	Clinic manager and virology group member,Harborview Medical Center STD Clinic, Seattle WA
Benkers, Nicole Genetics M.S., 2004	Science Teacher, Federal Way WA school district
Bleyhl, Jonathan Genome Sciences M.S., 2006	Traveling (graduated 6/06)
Bonham, Michael Molecular Biotechnology Ph.D., 2004	Pathology Residency, UCLA School of Medicine
Boyle, Rosemary Genome Sciences M.S., 2004	Out of science
Bubb, Kerry Genetics Ph.D., 2006	Maternity leave (graduated 8/06)
Dubb, Lindsey Genetics Ph.D., 2005	Out of science
Eacker, Stephen Genetics Ph.D., 2006	Postdoctoral Fellow, Johns Hopkins University
Eklund, Jennifer Genetics Ph.D., 2004	Postdoctoral Fellow, University of Michigan
Garg, Kavita Molecular Biotechnology Ph.D., 2006	Postdoctoral Fellow, University of Washington
Hastings, Michele Genetics Ph.D., 2005	Maternity leave
Hwang, Dick Molecular Biotechnology Ph.D., 2005	University of Washington Medical School
McCune, Heather Genetics Ph.D., 2004	Postdoctoral Fellow, University of California, San Francisco
Miller, John Genetics Ph.D., 2004	Postdoctoral Fellow, The Buck Institute
Newman, Tera Molecular Biotechnology Ph.D., 2004	Postdoctoral Fellow, University of Washington
Ramos, Edward Molecular Biotechnology Ph.D., 2004	Genetics & Public Policy Fellow, National Human Genome Research Institute
Robinson, Robert Max Molecular Biotechnology Ph.D., 2004	Postdoctoral Fellow, University of Washington

Former Student / Degree	**Current Position**
Round, Elaine Genetics Ph.D., 2004	Out of science
Satterfield, Terrence Genetics Ph.D., 2004	Postdoctoral Fellow, University of Washington
Seamons, Audrey Molecular Biotechnology Ph.D., 2004	Postdoctoral Fellow, University of Washington
Sherman, James Molecular Biotechnology Ph.D., 2004	Postdoctoral Fellow, UW Friday Harbor Laboratories
Thaipisuttikul, Iyarit Genetics Ph.D., 2006	Postdoctoral Fellow, University of Washington
Tzoneva, Monika Genetics Ph.D., 2004	Out of science
Wallace, Elijah Genetics M.S., 2006	Staff Scientist, Emory University
Wheeler, Jeanna Genetics Ph.D., 2005	Postdoctoral Fellow, Oregon Health & Science University
Zuniga, Jessica Greene Genetics Ph.D., 2004	Out of science

Appendix F

Academic Unit's mission statement

Our goal is to address leading-edge questions in biology and medicine by developing and applying genetic, genomic and computational approaches that take advantage of genomic information now available for humans, model organisms and a host of other species.

Appendix G

Faculty Curriculum Vitae

Appendix H

HEC Board summary

Department of Genome Sciences
2006 Academic Program Review

a. Name of unit authorized to offer degrees

Dept of Genome Sciences

b. School or College(s) as applicable

School of Medicine

c. Exact title(s) of degrees offered

Genome Sciences Ph.D.

Genetics Ph.D. (for students who entered the department via the former Department of Genetics)

Molecular Biotechnology Ph.D. (for students who entered the department via the former Department of Molecular Biotechnology)

Genome Sciences M.S.

d. Year of last review

Genome Sciences was formed in Autumn 2001. This is our first review.

e. Brief description of the field and its history at the University of Washington (no more than one page).

Genome sciences is the study of genomes and their function. This rapidly evolving area includes, but is not limited to, the acquisition and organization of whole genome sequence, the study of genome architecture, gene expression, and gene and protein function.

The Department of Genome Sciences (GS) was formed in September of 2001 through the fusion of the Department of Genetics (College of Arts and Sciences) and the Department of Molecular Biotechnology (MBT) (School of Medicine). The Department is currently chaired by **Dr. Robert Waterston** (William Gates III Endowed Chair in Biomedical Sciences). The merger of Genetics and MBT immediately created a critical mass of faculty in this new area of biology. To strengthen an already outstanding group of faculty, the Department has expanded its training faculty by hiring six new primary faculty and by adding 18 Adjunct and Joint training faculty. The GS Department currently consists of 48 training faculty; 26 of these faculty have primary or joint appointments in Genome Sciences. Through this expansion we have acquired formidable strengths in computational biology, statistics, genomics and proteomics, human and medical genetics, and classical forward genetics and modern reverse genetics in several model organisms.

A major driving force of our field has been the sequencing of the human genome and many model organism genomes. This has been accompanied by the development of rapid high-throughput methods of assessing gene expression (e.g., gene chips), gene function (e.g., RNAi), and protein interaction (e.g., mass spectrometry and yeast two-hybrid screens). These developments have dramatically increased the quantitative component of biology and biomedicine and increased the need for strong computational and statistical skills. Our goal is to train our students to become outstanding scientists, educators and future leaders in this rapidly evolving field. We strive to train future generations of scientists across disciplines so that students with an experimental biology background have significant expertise in areas of computational biology and instrumentation; computational students have training in biology and wet lab experimentation, and students trained to develop tools for the next century will understand the needs of both biologists and computational scientists.

f. Documentation of continuing need for your program

Twenty-first century biological and medical scientists need to be trained with strong skills in computational biology, statistics, experimental biology and technology development. Our Department has rapidly built strengths in these areas and is poised to train the next generation of leaders. Applicant numbers are high, and our class sizes are large.

g. Assessment information relating to student learning outcomes and program effectiveness

Given that our Department is only 5 years old, it is not yet possible to provide data on the placement of our students in academia and industry. However, the predecessors of the GS Department, Genetics and MBT, had strong records in successfully training students. We are optimistic that with the outstanding faculty presently in the Department, the high caliber of student entering our unit, and a curriculum with strong components in computational biology, statistics, technology, and experimental science, our students will be highly successful after leaving our program.

h. Please complete the following grid:

	2006	2005	2004
Number of undergrad majors graduating from unit in each of the last three years	n/a	n/a	n/a
Number of master's degrees granted in each of the last three years	2	1	2
Number of doctoral degrees granted in each of the last three years	5	7	10

i. Plans to improve the quality and effectiveness of the program. What is the process by which your unit sets its overall goals? How often are departmental goals reviewed and reassessed? In what ways do you anticipate the goals of your program will change in the next ten years? Describe your goals for the next 5-7 years. Describe areas and strategies for developing your potential for academic and pedagogical leadership in your field. How could the college and/or university assist you in achieving your goals, especially through means other than increased budgets?

We believe we already have an exceptionally strong and effective program. Nonetheless, we will continue to hire new faculty in computational biology, experimental biology and technology development. To accommodate the greater reliance on computation and technology development in our field, we designed highly flexible lab spaces in the new Foege Building. Computational and experimental faculty will share open lab space on all of the floors of the building, rather than being clustered together only with others of similar expertise. We hope this configuration will foster collaboration between faculty members and strengthen interdisciplinary research within our Department. We are committed to hiring women faculty and underrepresented racial and ethnic minorities. We will also continue to recruit underrepresented racial and ethnic minorities into our graduate program. We have recently created curriculum committees who are reviewing our undergraduate and graduate course offerings. We are considering offering an undergraduate degree in Genome Sciences. We have begun to offer new undergraduate courses in Genome Sciences and will continue to do so as our faculty evolves and expands. To assess the effectiveness of our graduate program we will frequently query our students for feedback about the graduate course curriculum and structure of the Department. We will also closely follow the careers of our students after they graduate. The University could help us in this area by promoting our graduate program and others to underrepresented minorities at other institutions. One venue for this promotion would be advertisements during nationally televised sporting events.