Five-Year Academic Program Review

Molecular and Medical Genetics

Reviewed by: Karla Kent, David Covell, Sean Molloy

Reviewed on: May 29, 2013

Contents

Five Year Academic Program Review

1. Introduction

Program Name: Graduate Program in Molecular and Medical Genetics

1.1 Identify the participants in the self-evaluation process. Please select all that apply.

X Faculty
X Students
X Staff
Alumni
Employers
Others, please specify

1.2 When were meetings held to complete this self-evaluation process? Add date fields as needed.

Faculty input is encouraged and always welcome. Graduate education matters typically are a main topic of discussion at our monthly MMG Faculty meetings. In addition, the Director of Graduate Education oversees meetings of the MMG Graduate Education Committee, which is comprised of four primary faculty members. These discussions involve approving and improving content and style of current courses and recommending new courses, aspects of our Qualifying Exam and individual student matters. The teaching faculty and the Director seek student input on curriculum issues and other aspects of the training program that the students believe need adjustment.

1.3 Who prepared the document?

Prepared by Dr. Liskay and Ms. Katherine Rose Franklin with assistance from the faculty and the MMG Graduate Education Committee.

1.4 Who reviewed the report?

The MMG Graduate Education Committee (Drs. Liskay, McCullough, Dai and Richards).

1.5 Provide the faculty vote on the final draft of the report.

Number of faculty eligible to vote: 43

Number Agreed: 24

Number Disagreed: 0

Number Abstained: 19

2. Overview

2.1 Describe the program.

Use the box below to write the program mission

The Graduate Program in Molecular and Medical Genetics is designed to offer training in the area of genetics, and offers a range of training opportunities in molecular, cellular, developmental and human genetics. The areas of faculty research include molecular genetics, molecular biology of gene regulation, somatic cell genetics, developmental genetics, medical genetics, cytogenetics, molecular cytogenetics, population genetics, biochemical genetics, cell biology and biochemistry. Opportunities for graduate research on a variety of genetic problems is a central feature of the training program, with an emphasis on genetic, molecular and cellular approaches for analyzing normal and disease processes. A noteworthy feature of the program is that students have the opportunity to receive genetics clinical experience while participating in the Genetics Clinic on an optional basis.

Use the box below to describe the program's purpose

The purpose of the Graduate Program in Molecular and Medical Genetics is to train students in the area of genetics, in a broad sense but also as genetic relates to human disease.

Use the box below to identify the program's goals.

1. Participates actively and takes initiatives in research activities.
2. Ability to identify research questions(s) clearly and appropriate methodology.
3. Produces material that is suitable for publication.
4. Is knowledgeable of and utilizes concepts present in the key literature in the field.
5. Designs studies appropriate to question(s) addressed and draws appropriate conclusion from findings.
6. Demonstrates original, independent, and critical thinking.
7. Demonstrates a broad understanding of the context in which the research takes place and creates a theoretical framework based on relevant literature.
8. Demonstrates an understanding of relevant research methodologies and techniques and their appropriate application within one's research field.
9. Demonstrates scholarly written communication skills including clear, well-organized writing and in a style appropriate to purpose.
10. Demonstrates a thorough understanding of genetic fundamentals and the essential literature in their specific research area.
11. Is creative and innovative in one's approach to research.
12. Demonstrates oral communication skills, including clear and organized scientific presentations.
13. Ability to continuously accumulate knowledge of recent advances in one's specific research field and in related areas.
14. Ability to take Information from a variety of disciplines related to one's own research and to use this information to generate new ideas and approaches for solving problems.

2.2 How do these align with, and contribute to, the fulfillment of OHSU's mission, strategic goals and core themes?

The following is OHSU's mission statement as appears on OHSU's web site. Underlined are elements to which the Graduate Program in Molecular and Medical Genetics contributes:

As part of its multifaceted public mission, OHSU strives for excellence in education, research and scholarship, clinical practice and community service. Through its dynamic interdisciplinary environment, OHSU stimulates the spirit of inquiry, initiative, and cooperation among students, faculty and staff.

Setting the example for integrity, compassion and leadership, OHSU strives to:

- Educate tomorrow's health professionals, scientists, engineers and managers in top-tier programs that [to] prepare them for a lifetime of learning, leadership and contribution.
-
- Explore new basic, clinical and applied research frontiers in health and biomedical sciences, environmental and biomedical engineering and information sciences, and translate these discoveries, wherever possible, into applications in the health and commercial sectors.

2.3 Describe the curriculum, and if more than one award is given, highlight the progression in difficulty. Use the "Attach File" button below to upload the curriculum.

(See Appendix 1-Faculty & Curriculum)

3. Faculty and Staff Resources (Use the State of the Program Reports from the last five years to address these questions.)

3.1 Describe the major research thrusts of faculty, areas in which the research is particularly strong, areas that need to be strengthened and current research support.

Several of the laboratories focus on "tumor suppressor" and "oncogene" pathways involved in a variety of common human cancers, with one goal being to capitalize on this knowledge for translational research purposes. In addition, labs study DNA repair and genomic stability pathways, which when malfunctioning can lead to disease, most notably cancer. Other labs pursue gene therapy technologies to treat human disease is another emphasis. Population and quantitative genetic approaches for identifying genes involved in common human disease is another area of research. Labs affiliated with molecular diagnositics, cytogenetics and biochemical genetics services also offer opportunities for graduate training. One central theme in the program is the utilization of a variety of classical and contemporary genetic, molecular and cellular approaches for analyzing normal and disease processes.

3.2 Describe how OHSU has maintained adequate qualified faculty members and staff members in relation to the program's growth over the last five years.

Our faculty numbers in MMG have remained stable with some growth over the past 5 years. New primary faculty hires are: Drs. Amanda Vinson, Hiroyuki Nakai, Mushui Dai and Paul Spellman in the areas of statistical genetics, gene therapy, cancer genetics and genomics. New secondary faculty have joined the department, as well. Active recruitments are currently underway for several new faculty.

3.3 How successful has the program been in attracting and retaining faculty and leadership from demographically diverse backgrounds?

MMG has worked with the Office of Diversity to attract diverse faculty and have aggressively pursued outstanding candidates. During the last 5 years we have recruited and maintained a URM Faculty member. One recruitment is in process.

3.4 If recruitment and retention efforts have not produced desired diversity, what are your plans to recruit diverse faculty? What resources will be used or are needed to achieve these results?

Practically speaking, it is too soon to know of our success in recruiting more diverse faculty. We will continue to work with the Office of Diversity to attract diverse faculty.

3.5 What services has the program utilized to increase program effectiveness and further the academic mission? Please choose all that apply.

Teaching and Learning Center
Provost's Office
X Library
X Center for Diversity and Inclusion
Student Health
X Registrar
Financial Aid
X ITG
Campus Planning and Development
None
Other, please specify
Research Funding and Development Services

If "None" was selected, please click here to elaborate.

4. Enrollment/Degree Production (Use the State of the Program Reports from the last five years to address these questions. Each question has an "Attach File" option where charts or tables can be uploaded to demonstrate or emphasize your analysis.)

4.1 Is the five-year enrollment trend appropriate to the program's resources and capacity?

The general consensus of our training faculty is that the program is capable of supporting and should aim for an average of 4 matriculating students per year.

(See Appendix 2 Students)

4.2 Has the number and/or quality of matriculates changed in the last five years? If so, how? What is the impact?

The quality of matriculates in the MMG program has not changed significantly in the last 5 years.

4.3 Is the five-year trend in awarding degrees and certificates appropriate to the program's resources and capacity?

The general consensus of our training faculty is that the program should aim for an average of 4 matriculating students per year to achieve a “critical mass”.

4.4 How successful has the program been in attracting students from demographically diverse backgrounds?

The program is committed to attracting students from demographically diverse backgrounds. In the last 5 years, MMG has trained and attracted 3 Underrepresented Minority Students into the program, one of whom has received her Ph.D.

4.5 If you have not achieved desired results, what are your plans to recruit diverse students that add value to the learning environment? What resources will be used or are needed to achieve these results?

MMG falls under the PMCB program rubric in terms of recruiting new students. The MMG faculty encourages the recruitment of the best and most diverse students. Members of the MMG Faculty have been active participants of the PMCB Steering and Admission Committee, thus impacting various aspects of the PMCB mission. Members of the MMG have also provided opportunities in the form of summer internships designed to promote research interests among a diverse student population, thus demonstrating a commitment to recruit future graduate students from these backgrounds. Members of the faculty have attended national meetings that are directed at recruiting underrepresented minority groups into advance study in biomedical research.

4.6 What is the evidence of regional, national or international need for additional qualified individuals such as the program is producing? Please specify.

The understanding and application of classical and modern genetics is of obvious central importance in terms of addressing the health and welfare regionally, nationally and internationally.

4.7 Program availability (please select all that apply):

X Full-time
Part-time
Evening
Weekend

Place-bound
On-line

5. Other Resources

5.1 What is the current budget (present year) for this program?

> Funds are supplied as needed as the discretion of the Chair, e.g. bridge funding to support a student and their research in cases where the mentor is temporarily without adequate funding. These funds would come from the MMG department's general funds.

5.2 What revenue sources does the program have access to? Choose all that apply:

Tuition
State Appropriations
Clinical/Patient Care
Grants/Contracts X
Philanthropy
Indirect Cost Return
Other, please list: see item 5.1 above.

5.3 How does tuition (or graduate stipends) compare to similar programs at other institutions (ideally, compare against programs on the institutional peer list)?

> Graduate student stipends are determined by OHSU School of Medicine Graduate Studies. Based on the latest survey of similar programs at other institutions, our stipends are average when adjusted for Portland's cost of living.

5.4 Evaluate the adequacy of other resources necessary to support this program (e.g. library, computer equipment, facilities, research labs, clinical placements).

> Common resources such as library computer access, etc in general are adequate for supporting this program.

5.5 Has anything happened since the last review that has influenced expenditures?

Yes
No
N/A X

6. Student Learning Outcomes and Assessment(Use assessment reports from the past five years.)

6.1 Summarize how faculty members engage in ongoing systematic collection and analysis of meaningful, accessible and verifiable data that are appropriate indicators of student and graduate achievement of student learning outcomes.

> Our faculty as a whole determines achievement of student learning outcomes both formally and informally. For example, the Qualifying Exam Committees gage the student's performance during the exam as a measure of the student's readiness to pursue

the Ph.D. program. In addition, Research/Thesis Advisory Committees that meet on a regular basis according to program policy, gage the progress the student is making on their thesis research. Summary reports by the chair of the thesis committee on the student's progress are circulated to all members of the committee and to the MMG Director of Graduate Education and a copy placed in the student's file. Performance of students at formal journal club settings and research seminars to the Department plus informal presentations at individual lab meetings are also clear indicators of the student's progress and achievement of learning outcomes.

6.2 Summarize how the results are used to improve the program curriculum, learning experiences, instruction, student recruitment and/or academic and learning support.

Periodically, the MMG Graduate Education Committee meets to discuss issues such as the curriculum, student performance and progress, time to degree, number of students matriculating into MMG each year, etc. The MMG Graduate Education Committee reports on a regular basis to the MMG Faculty at monthly meetings any Graduate Education issues that are important enough to bring to the attention of the entire Graduate Faculty of MMG.

6.3 Describe briefly any other evidence considered in evaluating your program's effectiveness (student time-to-degree, retention and graduation rates, advisor/advisee relationships, mentoring).

The MMG Graduate Education Committee considers the time to degree average of students with an eye towards implementing policy that might help reduce this time.

6.4 What evidence does the program have about employment and/or further professional or graduate-level activities of program completers? What and how are alumni doing (e.g., industry or self-employment, geographic location, job, success indicators)?

In general, we as a Faculty are pleased with the accomplishments and activities of our student's post-graduation. Many of our students have gone on to postdoctoral positions at excellent labs. Students have also gone on to having faculty positions at academic institutions or positions in industry or other fields in which Ph.D. training has been beneficial. Our students have also produced a very good average number of publications during their training.

7. Other Information (optional)

Click here to add any additional information

8. Analysis and Conclusions

8.1 What are the strengths and achievements of the program's faculty, students and graduates?

Our graduate faculty are in general well-funded and respected by their peers in their areas of research. Our Faculty participates in teaching of graduate students at all levels including being course directors in Conjoint and MMG courses. Multidisciplinary

groups come together to provide advanced and comprehensive research and professional training in the area of molecular and medical genetics, particularly pertaining to human diseases Many of our students have gone on to postdoctoral positions at excellent labs. Students have also gone on to having faculty positions at academic institutions or positions in industry or other fields in which Ph.D. training has been beneficial.

8.2 How will the self-study be used for improvement against goals and targets? How will it inform planning, decision making and allocation of resources and capacity for the next five years?

The self-study will be analyzed and considered further by the MMG Graduate Education Committee, the Program Director and the Chair of MMG in consultation with the faculty.

8.3 What new resources and/or support do you need to achieve these goals and improvement targets?

The most important resource is additional highly motivated and talented students and adequate faculty with graduate training backgrounds.

9. Response to Previous Program Reviews

Click here to respond after at least one Academic Program Review has been completed.

N/A

10. Signature and Submission

The preparer's email address below acts as a signature verifying the report is complete and ready for submission.

Preparer's email address: liskaym@ohsu.edu

Date Submitted to Graduate Studies Office for review by the Graduate Council: April 5, 2013.

Molecular and Medical Genetics Graduate Program Faculty and Primary Affiliations

Primary Faculty

Mushui Dai, MD., Ph.D.,* Molecular and Medical Genetics
David H. Farrell, Ph.D., Molecular and Medical Genetics
Betsy Ferguson, Ph.D., Molecular and Medical Genetics
Melanie Gillingham, Ph.D., R.D, Molecular and Medical Genetics
Cary Harding, M.D., Molecular and Medical Genetics
Christina Harrington, Ph.D., Molecular and Medical Genetics
*Susan Hayflick, M.D.**,* Molecular and Medical Genetics
Doris Kretzschmar, Ph.D., Molecular and Medical Genetics
R. Michael Liskay, Ph.D.,* Molecular and Medical Genetics
R. Stephen Lloyd, Ph.D., Molecular and Medical Genetics
Amanda McCullough, Ph.D.,* Molecular and Medical Genetics
Stephen Moore, Ph.D., FACMG, Molecular and Medical Genetics
Robb Moses, M.D., Molecular and Medical Genetics
Hiroyuki Nakai, M.D., Ph.D., Molecular and Medical Genetics
Susan Olson, Ph.D., Molecular and Medical Genetics
Carolyn Sue Richards, Ph.D., FACMG, Molecular and Medical Genetics
Rosalie Sears, Ph.D., Molecular and Medical Genetics
Paul Spellman, Ph.D., Molecular and Medical Genetics
H. Scott Stadler, Ph.D., Molecular and Medical Genetics
Mitchell Turker, Ph.D., J.D., Molecular and Medical Genetics
Amanda Vinson, Ph.D., Molecular and Medical Genetics

Joint Faculty

John P. Adelman, Ph.D., The Vollum Institute
Joshi Alumkal, M.D., The Knight Cancer Institute Hematology & Medical Oncology
Grover Bagby, M.D., The Knight Cancer Institute Hematology & Medical Oncology
Lucia Carbone, Ph.D., Behavioral Neuroscience
David (Jamie) Fitzgerald, Ph.D., Orthopedics & Rehabilitation
Michael Forte, Ph.D., The Vollum Institute
Markus Grompe, M.D., Pediatrics
Maureen Hoatlin, Ph.D., Biochemistry & Molecular Biology Department
William Horton, M.D., Shriners Hospital
Brian Johnstone, Ph.D., Orthopedics & Rehabilitation
David Koeller, M.D., Pediatrics
Patricia Kramer, Ph.D., Layton Aging and Alzheimer's Disease Center
Cheryl Maslen, Ph.D., Department of Medicine
Shoukhrat Mitalipov, Ph.D., Oregon National Primate Research Center
Carrie Nielson, Ph.D., Public Health & Preventive Medicine
Richard Press, M.D., Ph.D., Pathology
Lynn Sakai, Ph.D., Biochemistry & Molecular Biology
Julie Saugstad, Ph.D., Anesthesiology and Peri-Operative Medicine
J. Timothy Stout, M.D., Ph.D., MBA, Ophthalmology
Matthew Thayer, Ph.D., Biochemistry & Molecular Biology
Richard Weleber, M.D., Ophthalmology
Mary Wirtz, Ph.D., Ophthalmology

*Graduate Education Committee, **Department Chair

The Molecular and Medical Genetics Ph.D. program is organized as follows:

Year 1: Begin to complete course requirements.
Complete three laboratory rotations.
Prepare for and complete the 1st-year PMCB comprehensive qualifying exam.
(Students scoring below 70% on the 1st year comprehensive qualifying exam will be required to take a course of action to remediate the deficiency. Remediation should be completed no later than Spring of year 2.)
Choose a dissertation advisor.
Note: During the first year, the student will be mentored by a PMCB advisor, appointed by the PMCB Advisory Committee.

Year 2: Complete required and elective courses.
Prepare for and complete the 2nd-year candidacy exam.

Year 3 and up: Undertake research leading to the Ph.D. dissertation.
Attend and participate in Departmental Seminars and a Journal Club

REQUIRED GRADUATE COURSES IN MOLECULAR AND MEDICAL GENETICS

Fall Term 2nd Year:

MGEN 622	Eukaryotic Genetics	3 credits
MGEN 607a	Departmental Seminar	1 credit
MGEN 611	Departmental Grand Rounds*	1 credit
MGEN 601	Research	6-10 credits
Journal Club		1 credit
Elective Courses		0-4 credits
	Second Year Fall Term Course Total:	16 credits

Winter Term 2nd Year:

MGEN 611	Departmental Grand Rounds*	1 credit
MGEN 607a	Department Seminar	1 credit
MGEN 601	Research	9-13 credits
Journal Club		1 credit
Elective Courses		0-4 credits
	Second Year Winter Term Course Total:	16 credits

Spring Term 2nd Year:

MGEN 623	Genetic Basis of Human Disease	3 credits
MGEN 610	*Essentials of Molecular & Medical Genetics*	2 credits*(optional elective)*
MGEN 611	Departmental Grand Rounds*	1 credit
MGEN 607a	Departmental Seminar	1 credit
MGEN 601	Research	5-9 credits
Journal Club		1 credit
Elective Courses		0-4 credits
	Second Year Spring Term Course Total:	16 credits

Summer Term 2nd Year:

MGEN 601	Research	16 credits
	Second Year Summer Term Course Total:	16 credits

Fall/Winter /Spring Terms 3rd Year through Completion:

MGEN 610	*Essentials of Molecular & Medical Genetics (optional teaching)*	
	Journal Club	1 credit
MGEN 607a	Departmental Seminar	1 credit
MGEN 601	Research	14 credits
	Course Total:	16 credits

Summer Terms Through Completion:

MGEN 601	Research	16 credits

I. NOTES TO COURSE REQUIREMENTS

A. Students are required to:

1. Register for and attend any basic science journal club at the 600 level, year 2 through end of program. Senior students registered for dissertation credit are not required to register for a journal club; however, attendance is encouraged.

2. Register for and attend the Departmental Seminar, MGEN 607, held at 4 p.m. on Wednesdays, Year 2 through end of program, including the term registered for dissertation credit. 3rd year and beyond students are required to give a presentation of their thesis research once per year.

3. *Register for and attend at least two terms of Departmental Grand Rounds, MGEN 611, held at 9 a.m. on Thursdays during the academic calendar year. The two terms of Grand Rounds can be completed at any time but are required for completion of the Ph.D.

B. The School of Medicine requires that a student maintain a grade point average of 3.0. A student with a GPA below 3.0 is automatically put on academic probation and has one term to improve the GPA to a 3.0 or above. If the GPA is not at 3.0 or above within one term, the student may be terminated from the program. (See Bylaws of the Graduate Council, page 10, "Standard of Performance."). Under certain circumstances, a student may be granted up to four academic terms to correct deficiencies that resulted in academic probation. Probationary students who fail to achieve a cumulative grade point average of 3.0 within four terms shall be recommended for dismissal from the graduate program for inadequate scholarship.

C. Only course work (required and elective), and not research credits, will contribute to the GPA. Students must receive a grade of A or B in the required courses specified in this document. The grade of 'B minus' is unacceptable. If a student does not receive an A or B, the student must repeat the course the following year. The course can be repeated one time only. Failure to receive an A or B the second time the course is taken will result in dismissal from the program. The required courses for which this rule applies are CON 661, 662, 663, 664, 665, 667, 668 and MGEN 622, 623.

D. The grade Incomplete is reserved for circumstances in which a student is unable to complete the course requirements by the end of the term in which the course is offered due to circumstances beyond his/her control (e.g. illness), **AND** it is possible to fulfill the remaining requirements within the subsequent term to earn a grade. If a graduate student is having difficulty with a course, he/she may consider formally withdrawing. If the graduate student opts to complete the course, and the resulting grade is unsatisfactory, the student may re-take the course the next time it is offered, not register, and ask that the new grade be substituted for the old by the course director. Withdrawing and grade replacement require approval by the course director and formal notification of the Registrar.

E. If a graduate student fails a semester of research credits (i.e. receives an NP - No Pass on research), the student is put on immediate academic probation. The student is required to obtain a passing grade in the next term (and subsequent terms) of research credits or the student may be terminated from the Ph.D. Graduate Program in Molecular and Medical Genetics.

1. Pre-qualifying Graduate Students:
   A pre-qualifying graduate student is required to notify and meet with his/her TAC advisor immediately upon receiving a failing grade on the research credits in any one term. The TAC advisor will suggest a course of action that the student must follow in correcting his/her academic performance.

2. Post-qualifying Graduate Students:
   A post-qualifying graduate student, (in consultation with his/her mentor) is to schedule a Dissertation Advisory Committee meeting immediately upon receiving a failing grade on his/her research credits in any one term. This Dissertation Advisory Committee meeting must take place within two weeks of receipt of the failing grade on the research credits. The Mentor and Dissertation Advisory Committee will suggest a course of action that the student must follow in correcting his/her research program.

F. MMG Seminar, MGEN 607, must be registered for and taken Year 2 through end of program, including the term registered for dissertation credit. Students with more than 3 unexcused absences during the year will receive a grade of not passed (NP) for the seminar course. Attendance may be excused for illness, major family emergency or attending a regional, national or international scientific meeting. When a seminar is missed, the student should email the MMG Graduate Studies coordinator indicating the reason for not attending the specific seminar session. **Performing laboratory studies is not an excuse for not attending the seminar.** A graduate student who receives a NP will be placed on immediate academic probation. The student must receive a 'Pass' the subsequent term and every term thereafter.

G. Genetics Grand Rounds requires documentation of attendance in order to be considered for the grade of 'Pass.' A total of one (1) unexcused absence per term for Genetics Grand Rounds is allowed. A graduate student who receives a NP will be placed on immediate academic probation. The student must receive a 'Pass' the subsequent term and every term thereafter.

Following receipt of the first 'No Pass,' a pre-qualifying exam student must immediately meet with his/her TAC advisor; a post-qualifying exam student must immediately meet

with his/her dissertation advisory committee. A plan for insuring the attendance goal for the next term should be designed.

Two grades of 'No Pass' in any one of the three activities disqualifies a student from taking his/her qualifying exam, resulting in dismissal from the MMG Graduate Program.

Two grades of 'No Pass' in any one of the three activities for a post-qualifying exam student may result in dismissal from the MMG Graduate Program.

II. ELECTIVE COURSES

A total of 4 credit hours of Elective Courses are required to be eligible for the degree. An elective can be any basic science course at the 600 level. Students are strongly encouraged to take at least one elective course during Fall term of their second year.

Please Note: Journal Club, Seminar courses and Grand Rounds cannot be used to fulfill the Elective Course requirement.

The following are only a few of the popular electives taken by some of the graduate students in MMG. Other courses available are listed in the course catalog and graduate students are encouraged to speak to their TAC advisor or mentor when considering taking other courses.

MGEN 624	Gene & Cell Therapy, 2 Credits, Winter
CANB 610	Current Topics in Cancer Biology, Winter
MGEN 610	Essentials of Molecular & Medical Genetics, 2 credits, Spring (2^{nd} yr elective)
PHPM 524	Intro to Biostatistics
CELL 622	Topics in Transcriptional Regulation, 2 credits, Fall
MBM 656	Topics in Molecular Genetics, 2 credits, Fall
BMI 510	Intro to Biomed Informatics, 3 credits, Spring
MGEN 620	Interviewing & Counseling Techniques for Genetic Counseling, 1 credit, Winter
BEHN 625	Behavioral Genetics, 4 credits, Spring
CELL 611-0	Histology: Structure/Function of Cells in Tissues, 4 credits, Spring
BCMB 618	Protein Design: Structure Related to Function, 3 credits, Winter
CELL 616	Advanced Topics: Cancer Biology, Spring, 3 credits (alternate years)
CELL 618	Mechanisms of Development, 3 credits, Winter (alternate years)

III. PMCB/MMG QUALIFYING EXAMINATION

The purpose of the Qualifying Examination is two-fold. First, the examination will determine if the student has acquired sufficient knowledge and skills to pursue his or her Ph.D. dissertation work. Second, the exam will provide the student with an opportunity to practice the preparation of a research proposal. Before taking the examination, the student must have completed the PMCB and MMG course requirements. In the event that a required course is not offered before the end of the second year, and the student is otherwise prepared to take the candidacy examination, the examination may proceed without completion of the course. However, the required course must be taken prior to the dissertation defense.

During the oral portion of the examination, the student will be expected to make a presentation of the research proposal that should be no longer than 30 minutes. The presentation is followed by questioning that may cover all areas of genetics and molecular biology relating to the written proposal as well as general knowledge of molecular and medical genetics.

The format, timing and all requirements for the Qualifying Examination may be found in the document "Academic Guidelines for PMCB", available on the PMCB website.

IV. Ph.D. DISSERTATION ADVISORY COMMITTEE GUIDELINES

Within three months of passing the Ph.D. Qualifying exam, the advisor and student must submit a suggested dissertation advisory committee to the MMG Director of Graduate Education (DGE) for approval. The following guidelines for the composition of the committee should be followed:

A. The committee should include the advisor and at least 3 other faculty members who represent expertise relevant to the student's dissertation project. The advisor will serve as the Chair of the committee and be responsible for moderating the discussions.

B. All members of the advisory committee must be members of the OHSU Graduate Faculty. At least one member of the committee must NOT have an appointment in MMG.

C. At least one member other than the advisor must be experienced in advising a Ph.D. dissertation student; that is, he/she must have been a mentor for at least one student who has successfully completed his/her Ph.D.

D. The responsibilities of the student are:

1. To schedule the meetings in a timely fashion

2. To submit a summary of research accomplished and proposed to the GSC who will distribute it to committee members one week prior to each committee meeting. Electronic submission to the GSC is acceptable.

3. To send to each committee member, the GSC, and the DGE a summary of the meeting and recommendations, and a tentative date for the next committee meeting. This must

be done **within 2 days** following the committee meeting. Electronic submission is acceptable.

4. The student must meet with the Committee at least once per year. Twice per year is strongly recommended. The student may meet more frequently on the recommendation of his/her Committee.

5. The GSC and DGE will be responsible for monitoring adherence to these guidelines.

V. MMG PREPARATION AND SUBMISSION OF DISSERTATION

A. The student will register for dissertation credit during the term(s) dedicated to writing the document and defending the dissertation. The hours for which the student registers should be decided in consultation with the mentor.

B. All instructions and guidelines adopted by the Graduate Council By-Laws shall be followed carefully.

C. In addition, the Department of Molecular and Medical Genetics requires the following actions in order for the student to present his/her dissertation:

1. At least seven weeks prior to the intended defense date, the student shall submit to the Graduate Student Coordinator (GSC), in person, as many copies of his/her dissertation in final form as necessary (one copy per Dissertation Advisory Committee Member). This shall not be a rough draft. All illustrations and legends need to be enclosed at this time. It is in the student's best interest to submit a well-thought out, prepared dissertation in order to prevent further time delays. It is recommended that the dissertation draft be reviewed thoroughly by the student's mentor prior to submission. The student or GSC will then submit a copy of the dissertation to each of the graduate student's Dissertation Advisory Committee Members with an MMG Dissertation Approval form attached.

2. The Dissertation Advisory Committee Members shall have up to two weeks to review the dissertation and return it to the student with his/her comments and guidelines for revision. Some revisions are normally required and can include the necessity for further experiments. The Dissertation Advisory Committee members may sign off on the MMG Dissertation Approval form following the two-week review should they believe that the dissertation draft is in a form adequately on track to meet the intended defense date.

3. All members of the Dissertation Advisory Committee must sign the Dissertation Approval Form. It is the responsibility of the student to insure that each committee member has signed the form and that all forms are returned to the GSC. The student may proceed to defense with no more than one Dissertation Advisory Committee Member deeming the dissertation unsatisfactory. Once all Dissertation Approval Forms have been submitted, the GSC will advise the MMG Director of Graduate Education (DGE) that the student is ready to proceed to the next step toward the defense.

4. At this time the student will submit to the GSC the Graduate Studies Program "Request for Oral Examination" form which lists the members of the Dissertation Examination Committee which may include some or all of the Dissertation Advisory Committee members, noting the Dissertation Examination Chairperson in the area provided on the Dissertation Approval Form. The Chairperson must be a Graduate Faculty member but cannot be a member (or a joint appointee) of the Department of Molecular and Medical Genetics nor can the Chairperson be the student's mentor. In addition, the SOM requires appointment of an examination committee member **NOT** already a member of the Dissertation Advisory Committee.
5. The GSC will complete the Request for Oral Dissertation Examination Form and submit it to the DGE for signature. The GSC will then forward it on to the Graduate Studies office. **The submission of this form to the Graduate Studies office must be at least four weeks prior to the date of the exam.** It is recommended that at this time, the student submit a copy of his/her revised and approved dissertation to the GSC for distribution to the Dissertation Examination Committee**. The student must submit his/her approved dissertation no later than two weeks before the examination in order for the exam to take place as scheduled**. The GSC will record the date of submission and make sure that the student is in compliance with these guidelines. If the student is not in compliance with these guidelines, the GSC will notify the DGE. The DGE will then determine the proper course of action with the possibility of postponing the exam until the Committee has had at least two weeks to review the dissertation (dependent upon the Committee Members availability).

Appendix 2 – Students

OHSU Molecular and Medical Genetics Graduate Program

Students who have joined and/or matriculated between Fall 2007 and Spring 2012

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
Escamilla-Powers, Julienne	Y	Fall 2001	Fall 2001	-	Summer 2008	6.75	Sears	The Axin1 scaffold protein promotes formation of a degradation complex for c-Myc. Arnold HK, Zhang X, Daniel CJ, Tibbitts D, **Escamilla-Powers J**, Farrell A, Tokarz S, Morgan C, Sears RC. EMBO J. 2009 Mar 4;28(5):500-12. doi: 10.1038/emboj.2008.279. Epub 2009 Jan 8. Studying c-Myc serine 62 phosphorylation in leukemia cells: concern over antibody cross-reactivity. Tibbitts DC, **Escamilla-Powers JR**, Zhang X, Sears RC. Blood. 2012 May 31;119(22):5334-5. doi: 10.1182/blood-2012-03-414532. A conserved pathway that controls c-Myc protein stability through opposing phosphorylation events occurs in yeast. **Escamilla-Powers JR**, Sears RC. *(3 Publications)*	Identification of proteins that regulate c-Myc stability and function	Assistant Production Manager, R&D Department, TriLink Biotechnologies	Julenne33@hotmail.com
Friedman, Kevin	N	Fall 2001	Fall 2001	-	Fall 2008	7	Fox	Curr Mol Med. 2009 Aug;9(6):673-82. Cancer immunotherapy: the role regulatory T cells play and what can be done to overcome their inhibitory effects. Petrausch U, Poehlein CH, Jensen SM, Twitty C, Thompson JA, Assmann I, Puri S, LaCelle MG, Moudgil T, Maston L, **Friedman K**, Church S, Cardenas E, Haley DP, Walker EB, Akporiaye E, Weinberg AD, Rosenheim S, Crocenzi TS, Hu HM, Curti BD, Urba WJ, Fox BA. Robert W. Franz Cancer Research Center, Earle. A. Chiles Research Institute, 4805 NE Glisan Street, Portland, OR 97213, USA. *(1 Publication)*	Augmenting the effector phrase or adaptive immunotherapy of cancer	Postdoctoral Fellow at NCI, Bethesda, MD	friedmak@gmail.com

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
Oyer, Jon	N	Fall 2002	Fall 2002	-	Spring 2009	6.5	Turker	Mutat Res. 2011 Jan 10;706(1-2):21-7. doi: 10.1016/j.mrfmmm.2010.10.006. Epub 2010 Oct 28. Aberrantly silenced promoters retain a persistent memory of the silenced state after long-term reactivation. **Oyer JA**, Yates PA, Godsey S, Turker MS. PLoS One. 2009;4(3):e4832. doi: 10.1371/journal.pone.0004832. Epub 2009 Mar 12. Aberrant epigenetic silencing is triggered by a transient reduction in gene expression. **Oyer JA**, Chu A, Brar S, Turker MS. *(2 Publications)*	Changes in DNA methylation and histone modification during epigenetic transitions	Postdoctoral Fellow, OHSU	Kalama.jon@gmail.com
Johnson, Jennifer	N	Fall 2002	Fall 2002	-	Spring 2010	7.5	Liskay	**Johnson, J.R.,** Dudley, S.S., Wheeler, L.J., Mathews, C.K., and R.M. Liskay. Unexpected Consequences of Deoxycytidylate Deaminase Deficiency in Mammalian Cells. DNA Repair 9: 1209-1213 (2010). *(1 Publication)*	Genetic Analysis of Diverse Mechanisms of DNA Mismatch Repair in Mammalian Cells	Working at a law firm doing patent law	Jentron3030@gmail.com
Dismuke (Decker), Adria	N	Fall 2002	Fall 2002	Summer 2004	Summer 2009	6.75	Wong	Proc Natl Acad Sci U S A. 2006 Apr 18;103(16):6321-5. Epub 2006 Apr 10. Bone marrow-derived cells fuse with normal and transformed intestinal stem cells. Rizvi AZ, Swain JR, Davies PS, Bailey AS, **Decker AD**, Willenbring H, Grompe M, Fleming WH, Wong MH. *(1 Publication)*	Wnt Signaling in the Mouse Small Intestine	Law School, Lewis and Clark	deckera@gmail.com
Nelsen, Sylvia	N	Fall 2002	Fall 2002	-	Summer 2009	6.75	Christian	J Biol Chem. 2006 Nov 10;281(45):34021-31. Epub 2006 Sep 11. Regulation of bone morphogenetic protein-4 activity by sequence elements within the prodomain. Sopory S, **Nelsen SM**, Degnin C, Wong C, Christian JL. J Biol Chem. 2009 Oct 2;284(40):27157-66. doi: 10.1074/jbc.M109.028506. Epub 2009 Aug 3. Site-specific cleavage of BMP4 by furin, PC6, and PC7. **Nelsen SM**, Christian JL. *(2 Publications)*	Cloning and characterization of Xenopus laevis proprotein convertases and identification of endogenous convertases of bone morphogenetic protein	Postdoctoral Fellow, Christian Lab, OHSU	Sylvia.nelsen@comcast.net

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
LeShane, Erik	N	Fall 2003	Summer 2004	-	Spring 2010	6.5	Lutsenko	Arch Biochem Biophys. 2007 Jul 15;463(2):134-48. Epub 2007 May 2. Biochemical basis of regulation of human copper-transporting ATPases. Lutsenko S, **LeShane ES**, Shinde U. J Biol Chem. 2010 Feb 26;285(9):6327-36. doi: 10.1074/jbc.M109.074633. Epub 2009 Dec 23. Interactions between copper-binding sites determine the redox status and conformation of the regulatory N-terminal domain of ATP7B. **LeShane ES**, Shinde U, Walker JM, Barry AN, Blackburn NJ, Ralle M, Lutsenko S. Clin Cancer Res. 2009 Jun 1;15(11):3770-80. doi: 10.1158/1078-0432.CCR-08-2306. Epub 2009 May 26. Therapeutic Targeting of ATP7B in Ovarian Carcinoma. Mangala LS, Zuzel V, Schmandt R, **Leshane ES**, Halder JB, Armaiz-Pena GN, Spannuth WA, Tanaka T, Shahzad MM, Lin YG, Nick AM, Danes CG, Lee JW, Jennings NB, Vivas-Mejia PE, Wolf JK, Coleman RL, Siddik ZH, Lopez-Berestein G, Lutsenko S, Sood AK. *(3 Publications)*	Structural Organization and Mechanisms of Cooperativity in the N-Terminal Domains of the Human Cu-ATPasses	Postdoctoral Fellow, Earle A Chiles Research Institute	Erik.Leshane@gmail.com
Miller, Ashleigh	N	Fall 2003	Summer 2004	Summer 2005	Summer 2009	5.75	Liskay	**Miller, A.J.,** Dudley, S.D., Tsao, J.-L., Shibata, D. and R.M. Liskay. Tractable Cre-lox system for stochastic alteration of genes in mice. Nature Methods 5: 227-229 (2008). Fischer, J.M., **Miller, AJ,** Shibata, D and R.M. Liskay. Different Phenotypic Consequences of Simultaneous Versus Stepwise Apc Loss. Oncogene 31: 2028-38 (2012). *(2 Publications)*	Stochastic Gene Alterations for the Study of Intestinal Homeostatis and Cancer	Postdoctoral Fellowship, UCSF	Ashley.Miller@gmail.com

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
Rein, Chantelle	N	Fall 2003	Summer 2004	Fall 2005	Spring 2010	6.5	Farrell	Blood Coagul Fibrinolysis. 2010 Jul;21(5):494-7. doi: 10.1097/MBC.0b013e3283393c7c. Severe bleeding in a woman heterozygous for the fibrinogen gammaR275C mutation. **Rein CM**, Anderson BL, Ballard MM, Domes CM, Johnston JM, Madsen RJ Jr, Wolper KK, Terker AS, Strother JM, Deloughery TG, Farrell DH. Thromb Haemost. 2008 Nov;100(5):837-46. gammaA/gamma' fibrinogen inhibits thrombin-induced platelet aggregation. Lovely RS, **Rein CM**, White TC, Jouihan SA, Boshkov LK, Bakke AC, McCarty OJ, Farrell DH. Thromb Haemost. 2008 Jun;99(6):1008-12. doi: 10.1160/TH07-06-0427. Fibrinogen Hershey IV: a novel dysfibrinogen with a gammaV411I mutation in the integrin alpha(IIb)beta(3) binding site. Flood VH, Al-Mondhiry HA, **Rein CM**, Alexander KS, Lovely RS, Shackleton KM, David LL, Farrell DH.d *(3 Publications)*	Genetic Regulation of the Expression of Two Fibrinogen Gamma Chain Splice Variants by Inflammatory Cytokines and Fibrin Degradation Products	Postdoctoral Fellowship, UNC Chapel Hill	Channypants@gmail.com
Polster, Brenda	N	Fall 2003	Summer 2004	Summer 2005	Summer 2010	6.75	Hayflick	J Med Genet. 2009 Feb;46(2):73-80. doi: 10.1136/jmg.2008.061929. Epub 2008 Nov 3. Clinical and genetic delineation of neurodegeneration with brain iron accumulation. Gregory A, **Polster BJ**, Hayflick SJ. Mol Genet Metab. 2010 Oct-Nov;101(2-3):292-5. doi: 10.1016/j.ymgme.2010.07.016. Epub 2010 Aug 4. Discordant expression of miR-103/7 and pantothenate kinase host genes in mouse. **Polster BJ**, Westaway SK, Nguyen TM, Yoon MY, Hayflick SJ. Brain Res Bull. 2010 Nov 20;83(6):374-9. doi: 10.1016/j.brainresbull.2010.08.011. Epub 2010 Sep 9. Expression of PLA2G6 in human fetal development: Implications for infantile neuroaxonal dystrophy.	Regulation and Expression of Genes Associated with Neuro-degeneration with Brain Iron Accumulation	Adjunct Faculty, Lewis and Clark College	Brendapolster@gmail.com

								Polster B, Crosier M, Lindsay S, Hayflick S. Gene. 2010 Oct 1;465(1-2):53-60. doi: 10.1016/j.gene.2010.06.011. Epub 2010 Jul 11. Characterization of the human PANK2 promoter. **Polster BJ**, Yoon MY, Hayflick SJ. Ann Neurol. 2010 Nov;68(5):611-8. doi: 10.1002/ana.22122. Defective FA2H leads to a novel form of neurodegeneration with brain iron accumulation (NBIA). Kruer MC, Paisán-Ruiz C, Boddaert N, Yoon MY, Hama H, Gregory A, Malandrini A, Woltjer RL, Munnich A, Gobin S, **Polster BJ**, Palmeri S, Edvardson S, Hardy J, Houlden H, Hayflick SJ. *(5 Publications)*			
Name	**URM**	**Joined PMCB**	**Joined MMG**	**Qualifying Exam**	**Thesis Defense**	**Years to Graduate**	**Mentor**	**Publications**	**Thesis Title**	**Position after PhD**	**Email**
De Graaf, Bendert	N	-	Spring 2005	-	Summer 2009	4.25	McCullough	DNA Repair (Amst). 2009 Oct 2;8(10):1207-14. doi: 10.1016/j.dnarep.2009.06.007. Epub 2009 Jul 21. Cellular pathways for DNA repair and damage tolerance of formaldehyde-induced DNA-protein crosslinks. **de Graaf B**, Clore A, McCullough AK. *(1 Publication)*	Cellular Response Pathways of Formaldahyde	Project Manager, Vitens, The Netherlands	Degraafbendert@gmail.com
Sauter, Kristin	N	Fall 2004	Fall 2005	Summer 2006	Spring 2010	6.5	Magun	Cancer Biol Ther. 2011 Jun 15;11(12):1008-16. Epub 2011 Jun 15. Doxorubicin and daunorubicin induce processing and release of interleukin-1β through activation of the NLRP3 inflammasome. **Sauter KA**, Wood LJ, Wong J, Iordanov M, Magun BE. Infect Immun. 2008 Oct;76(10):4469-78. doi: 10.1128/IAI.00592-08. Epub 2008 Aug 11. Mouse model of hemolytic-uremic syndrome caused by endotoxin-free Shiga toxin 2 (Stx2) and protection from lethal outcome by anti-Stx2 antibody. **Sauter KA**, Melton-Celsa AR, Larkin K, Troxell ML, O'Brien AD, Magun BE. Cancer Biol Ther. 2010 Aug 1;10(3):258-66. Epub 2010 Aug 13.	Ribotoxic Stressors: Shiga toxin (Stx) and doxorubicin	Postdoctoral Fellow, Roslin Institute	kristindiez@hotmail.com

								ZAK is required for doxorubicin, a novel ribotoxic stressor, to induce SAPK activation and apoptosis in HaCaT cells. **Sauter KA**, Magun EA, Iordanov MS, Magun BE. *(3 Publications)*			
Name	**URM**	**Joined PMCB**	**Joined MMG**	**Qualifying Exam**	**Thesis Defense**	**Years to Graduate**	**Mentor**	**Publications**	**Thesis Title**	**Position after PhD**	**Email**
Tibbitts, Deanne	N	Fall 2004	Summer 2005	Summer 2006	Summer 2011	6.75	Sears	EMBO J. 2009 Mar 4;28(5):500-12. doi: 10.1038/emboj.2008.279. Epub 2009 Jan 8. The Axin1 scaffold protein promotes formation of a degradation complex for c-Myc. Arnold HK, Zhang X, Daniel CJ, **Tibbitts D**, Escamilla-Powers J, Farrell A, Tokarz S, Morgan C, Sears RC. Blood. 2012 May 31;119(22):5334-5. doi: 10.1182/blood-2012-03-414532. Studying c-Myc serine 62 phosphorylation in leukemia cells: concern over antibody cross-reactivity. **Tibbitts DC**, Escamilla-Powers JR, Zhang X, Sears RC. J Exp Med. 2007 Aug 6;204(8):1813-24. Epub 2007 Jul 23. FBW7 mutations in leukemic cells mediate NOTCH pathway activation and resistance to gamma-secretase inhibitors. O'Neil J, Grim J, Strack P, Rao S, **Tibbitts D**, Winter C, Hardwick J, Welcker M, Meijerink JP, Pieters R, Draetta G, Sears R, Clurman BE, Look AT. Leukemia. 2006 Sep;20(9):1572-81. Epub 2006 Jul 20. Aberrant stabilization of c-Myc protein in some lymphoblastic leukemias. Malempati S, **Tibbitts D**, Cunningham M, Akkari Y, Olson S, Fan G, Sears RC. *(4 Publications)*	Characterization of aberrant c-Myc phosphorylation and stability in acute myeloid and lymphoblastic leukemia	Postdoctoral Fellow, Sears Lab, OHSU	Arielsong88@gmail.com

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
Zhang, Xiaoli	N	Fall 2004	Summer 2005	Summer 2006	Summer 2011	6.75	Sears	**Xiaoli Zhang**, Amy Farrell, Hugh Arnold, Colin Daniel, Charles Scanlan, Bryan Laraway, Lawrence Lum, Dexi Chen, Megan Troxell & Rosalie C. Sears. Mechanistic insight into c-Myc stabilization in breast cancer involving aberrant Axin1 expression. PNAS in press, 2011.; Kishore Challagundla, Xiao-Xin Sun, **Xiaoli Zhang**, Tiffany DeVine, Qinghong Zhang, Rosalie Sears, and Mu-Shui DAI. Ribosomal protein L11 recruits miR-24/miRISC to repress c-Myc expression in response to ribosomal stress. Mol Cell Biol. In press. 2011.; Xiaoyan Wang, Melissa Cunningham, **Xiaoli Zhang**, Sara Tokarz, Bryan Laraway, Megan Troxell and Rosalie C. Sears. Phosphorylation regulates c-Myc's oncogenic activity in the mammary gland. Cancer Res, 71(3): 925-36, 2011.; Julie Escmilla-Powers, Colin Daniel, Amy Farrell, Karyn Taylor, **Xiaoli Zhang**, Sarah Byes and Rosalie C. Sears. The tumor suppressor protein HBP1 is a novel c-myc-binding protein that negatively regulates c-myc transcriptional activity. J Biol Chem, 285 (7): 4847-58, 2010. *(4 Publications)*	Regulation of c-Myc phosphorylation, protein stability and oncogenic activity in breast cancer	Postdoctoral Fellow, Sears Lab, OHSU	Oregon7286@gmail.com
Alexander, Kristine	N	Fall 2005	Summer 2006	Summer 2007	Summer 2012	6.75	Farrell	**Alexander K.S**., Madden, T.E., Farrell, D.H., (2010) Association Between γ' Fibrinogen Levels and Inflammation. Thrombosis and Haemostasis 105(4):605-609 Thromb Haemost. 2008 Jun;99(6):1008-12. doi: 10.1160/TH07-06-0427. Fibrinogen Hershey IV: a novel dysfibrinogen with a gammaV411I mutation in the integrin alpha(IIb)beta(3) binding site. Flood VH, Al-Mondhiry HA, Rein CM, **Alexander KS**, Lovely RS, Shackleton KM, David LL, Farrell DH. Biochemistry. 2012 Apr 24;51(16):3445-50. doi: 10.1021/bi2016519. Epub 2012 Apr 15. Role of electrostatic interactions in binding of thrombin to the fibrinogen γ' chain. **Alexander KS**, Fried MG, Farrell DH. *(3 Publications)*	Characterization of γ' Fibrogen as a Cardiovascular Risk Marker	Postdoctoral Fellow, University of Vermont	Phishstyx42@yahoo.com

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
Redig, Jennifer	N	Fall 2005	Summer 2006	Summer 2007	Spring 2011	5.5	Maslen	**Redig, J.K.** and Adler, Eric. Doing the Dirty work: Progress in the Search for a Reliable Protocol for Cardiomyogenesis. Stem Cell research & Therapy, in press. Circ Cardiovasc Genet. 2012 Jun;5(3):301-8. doi: 10.1161/CIRCGENETICS.111.960872. Epub 2012 Apr 20. Genetic modifiers predisposing to congenital heart disease in the sensitized Down syndrome population. Li H, Cherry S, Klinedinst D, DeLeon V, **Redig J**, Reshey B, Chin MT, Sherman SL, Maslen CL, Reeves RH. Gene. 2006 Nov 1;382:111-20. Epub 2006 Jul 7. CRELD2: gene mapping, alternate splicing, and comparative genomic identification of the promoter region. Maslen CL, Babcock D, **Redig JK**, Kapeli K, Akkari YM, Olson SB. Stem Cell Res Ther. 2011 Aug 15;2(4):35. doi: 10.1186/scrt76. Doing the dirty work: progress in the search for a reliable protocol for cardiomyogenesis. **Redig JK**, Adler E. *(4 Publications)*	A novel CRELD1/VEGF genetic interaction in heart disease and development	Postdoctoral Fellow, Stanford	jredig@ gmail.com
Strofregen, Eric	N	Fall 2005	Summer 2006	Summer 2007	Summer 2011	5.5	Thayer	**Strofregen, E.P.**, Donley, N., Stauffer, D., Smith, L., and Tahyer, M.J. (2011) Aan Autosomal Locus that Controls Chromosome-wide Replciation Timing and Mono-Allelic expression." Human Molecular Genetics 20(12), 2366-2378. *(1 Publication)*	Genetic Analysis of Chromosome Replication Timing: An Autosomal Locus that Controls Chromosome-wide Replication Timing and Mono-allelic Expression	Postdoctoral Fellow, University of North Carolina, Chapel Hill, NC	Eric.Stoffrege@ gmail.com

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Thesis Defense	Years to Graduate	Mentor	Publications	Thesis Title	Position after PhD	Email
Hickey, Ray	N	Fall 2006	Summer 2007	Summer 2008	Winter 2012	5.25	Grompe	Efficient production of Fah-null heterozygote pigs by chimeric adeno-associated virus-mediated gene knockout and somatic cell nuclear transfer. **Hickey RD,** Lillegard JB, Fisher JE, McKenzie TJ, Hofherr SE, Finegold MJ, Nyberg SL, Grompe M. Hepatology 2011 Jun 14 doi:10. 1002/hep.24490. PMID:21674562; The ploidy conveyor of mature hepatocytes as a source of genetic variation. Duncan AW, Taylor, MH, **Hickey RD**, Hanlon Newell AE, Lenzi ML, Olson SB, Finegold MJ, Grompe M. Nature. 2010 Oct 7; 467(7316):707-10. Epub 2010 Sep.22. PMID:20861837 *(2 Publications)*	Cell therapy for disorders of digestive and metabolic diseases	Postdoctoral Fellow, Mayo, Rochester MN	Hickey raymond@yahoo.ie
Nelson, Jonathan	N	Fall 2007	Fall 2008	Summer 2009	Spring 2013 (student successfully defended 4/3/13, final paperwork is in progress).	5.5	Alkayed	Neuroscience. 2012 Sep 6;219:183-91. doi: 10.1016/j.neuroscience.2012.05.048. Epub 2012 May 26. Mechanism of the sex difference in neuronal ischemic cell death. Fairbanks SL, Young JM, **Nelson JW**, Davis CM, Koerner IP, Alkayed NJ. J Biol Chem. 2013 Mar 15;288(11):7697-703. doi: 10.1074/jbc.M112.429258. Epub 2013 Jan 28. Soluble epoxide hydrolase dimerization is required for hydrolase activity. **Nelson JW**, Subrahmanyan RM, Summers SA, Xiao X, Alkayed NJ. Arterioscler Thromb Vasc Biol. 2012 Aug;32(8):1936-42. doi: 10.1161/ATVBAHA.112.251520. Epub 2012 Jun 21. Soluble epoxide hydrolase: sex differences and role in endothelial cell survival. Gupta NC, Davis CM, **Nelson JW**, Young JM, Alkayed NJ. *(3 Publications)*	Disruption of soluble epoxide Hydrolase as a Novel Therapeutic Target for Stroke	Postdoctoral Fellow, Alkayed Lab, OHSU. Anticipated grant from the Heart Research Center.	Final paperwork in progress.

Average years to graduate for students who have joined and/or matriculated between Fall 2007 and Spring 2012: **6.3**

OHSU Molecular and Medical Genetics Graduate Program

Current Graduate Students

Name	URM	Joined PMCB	Joined MMG	Qualifying Exam	Mentor
Fletcher, Autumn	N	Summer 2007	Summer 2008	Fall 2009	Gillingham
Owen, Nichole	N	Fall 2010	Spring 2011	Fall 2012	Olson
Mitchell, Asia	Y	Fall 2011	Summer 2012	TBD	Spellman
Juarez, Eleanora	Y	Fall 2011	Fall 2012	TBD	McCullough
Sunderhaus, Elizabeth	N	Summer 2012	Spring 2013	TBD	Kretzschmar