Five-Year Academic Program Review

Molecular and Medical Genetics

Reviewed by: David Covell, Karla Kent, Sean Molloy

Reviewed on: May 29, 2013

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Dear Dr. Liskay and Faculty:

The primary goal of the Academic Program Review is to maintain and strengthen the quality of OHSU’s undergraduate and graduate degree programs. Reviews are intended to be helpful and supportive in (i) recognizing strengths and achievements of academic programs; (ii) promoting program planning and goal setting aligned with OHSU’s strategic plan (Vision 2020) and the requirements of the Northwest Commission on Colleges and Universities and specialized accreditation agencies; and (iii) identifying areas unique to and/or common among academic programs that require attention. In carrying out these aims, each program will be reviewed at least once every five years. In preparing for this review, each unit scheduled for review conducts a self-review that focuses on its current situation and expectations for the next three to five years.

Completing the five-year Academic Program Review indicates the Molecular and Medical Genetics program’s commitment to on-going programmatic improvements and excellence. As this self-review process is new to OHSU, the Academic Program Review Committee values your contribution as we contemplate the most effective and efficient way to carry out this trailblazing work.

Your self-review report was discussed and evaluated by a Review Team of three members of the Academic Program Review Committee in May 2013. The following commendations and recommendations summarize the Review Team’s findings.

**Commendations:** The Review Team commends MMG in three areas: (1) strong faculty; (2) providing evidence that the program trains good people for the field; and (3) demonstrating a culture in which faculty feedback is valued by holding monthly faculty meetings.

**Recommendation:** The next review in 2018 should strive to more wholly describe what the program is doing in all areas. Provide an overview of future plans, identifying recruitment strategies and explaining how student feedback is gathered and utilized.

The Review Team’s comprehensive evaluation including ratings, commendations and recommendations specific to each section of the report follows.
Part I. Introduction
Rating: Developing. Process is complete, with dates of meetings and record of faculty vote; but engagement of stakeholders is narrow.
Commendation: Response demonstrates a process for eliciting feedback.
Recommendation: Provide documentation regarding feedback process.

Part 2. Overview
Rating: Developing. Program has established its own set of Mission, Purpose, Goals (MPGs) unique to the program, but MPGs are not aligned with university MPGs.
Commendation: The goals are good, well developed and specific. The curriculum description is good as well.
Recommendation: Demonstrate clearer alignment with OHSU goals; provide a better sense of where the program is going strategically. In addition to underlining which areas of the OHSU mission the program aligns with, provide a more analytical response to the alignment.

Part 3. Faculty and Staff Resources
Rating: Developing. Discussion of faculty trends, preliminary planning for program development, faculty diversity recruitment and retention. All courses are taught by highly qualified faculty. Program uses academic program services to a limited extent.
Commendation: Faculty numbers are stable and some growth is apparent. It is clear that URM recruitment is underway. Committee noted one URM faculty member as a positive.
Recommendation: Provide more description of what faculty "do" and what they are working on. Be more explicit in describing the budget and funding model. Better align the narrative and data.

Part 4. Enrollment/Degree Production
Rating: Developing. Curriculum appears to reflect current practice in the discipline. Uses some rudimentary analysis of trends in enrollment and degree production in the context of program quality and sustainability. No discussion of employment projections or prospects for program graduates. Some discussion about student diversity and planning for recruitment.
Commendation: The program has good strategies outlined for getting faculty to participate on committees. The committee noted the reference to summer program opportunities for diverse students as a positive. The graduation rate is good based on the number of students who matriculate into the program annually.
Recommendation: Provide explanation for the enrollment drop from previous years. Provide more clarity on time-to-degree ratio. Provide more detail about the program’s strategy for recruiting underrepresented students.
Other: The committee felt there were more opportunities for the program to discuss its strengths in this section. They also noted the difficulty PMCB programs have recruiting students to their labs when there are many choices in the PMCB umbrella.

Part 5. Other Resources
Rating: Developing. Preliminary discussion of the adequacy of resources; no resource planning for or identification of potential new revenue streams for the next 5 years. Identifies needs or sets priorities, but not linked to data. Limited discussion of context and extenuating circumstances affecting resource planning.
Commendation: Response in 5.3 is good.
Recommendation: More information and analysis in this section as a whole on the next review.
Other questions to consider: Is Philanthropy a funding source for the program? What competitors does the program lose students to and how do those competitors' stipends compare to OHSU's?

Part 6. Student Learning Outcomes and Assessment
Rating: Developing. Program-level student learning outcomes clear and measurable, reflecting three learning domains (Bloom's taxonomy), indirect and direct measures of learning are used; faculty committee discusses assessment results and uses results to improve curriculum and results; evidence of administrative support for assessment and resources for regular data collection. Some students are aware of the findings.
Commendation: Good responses in 6.1 and 6.2.
Recommendation: Provide more information about what alumni are doing beyond the first year out of the program. More detail/description in this section would be helpful including analysis on whether or not time-to-degree is improving.

Part 7. Other Information (Optional for Programs)
N/A

Part 8. Analysis and Conclusions
Rating: Developing. Reflects spirit of continuous improvement; directions for next 5 years are reasonably developed; selected one indicator for improvement and set a realistic target.
Commendation: Monthly faculty meetings! In general the committee thought the program demonstrated a strong, solid faculty and evidence of producing good people in the program.
Recommendation: Explain how student information/feedback is gathered. Provide an overview of future plans for the program. Identify strategies for recruiting more students and include the faculty's role in recruitment.

Part 9. Response to Previous Program Reviews
N/A

Part 10. Overall Recommendations
The committee wanted more detail and information about the program in the report. They felt the program was doing more in all areas than what was documented.
The Molecular and Medical Genetics program is invited to submit comments addressing the Review Team’s findings, or any component of the Academic Program Review process. Send comments to Sarah Kennedy (kennedsa@ohsu.edu) by August 19, 2013, and those comments will be included in the report to Faculty Senate at the September 12, 2013, meeting.

The Academic Program Review Committee determined that the Molecular and Medical Genetics program meets the academic standards of Oregon Health & Science University. Based on these findings, your next review is scheduled for 2018-19 by the Faculty Senate APR Committee, with your self-review and school-level processes beginning and concluding no later than 2017-18.

Sincerely,

Charles Allen, Ph.D., Committee Chair

CC: Jeanette Mladenovic, M.D., M.B.A., M.A.C.P., Provost
   Mark Richardson, M.D., M.Sc.B., M.B.A., Dean
   Allison Fryer, Ph.D., Associate Dean
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 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 diagnostics, 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
- Library
- Center for Diversity and Inclusion
- Student Health
- Registrar
- Financial Aid
- ITG
- Campus Planning and Development
- 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.
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
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
- 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

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 Wenteber, 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 2\textsuperscript{nd} Year:
\begin{itemize}
\item MGEN 601 Research \hspace{2cm} 16 credits
\end{itemize}
Second Year Summer Term Course Total: 16 credits

Fall/Winter /Spring Terms 3\textsuperscript{rd} Year through Completion:
\begin{itemize}
\item MGEN 610 Essentials of Molecular & Medical Genetics (optional teaching) 1 credit
\item Journal Club 1 credit
\item MGEN 607a Departmental Seminar 1 credit
\item MGEN 601 Research \hspace{2cm} 14 credits
\end{itemize}
Course Total: 16 credits

Summer Terms Through Completion:
\begin{itemize}
\item MGEN 601 Research \hspace{2cm} 16 credits
\end{itemize}

\section*{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 \textit{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 (2nd 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

<table>
<thead>
<tr>
<th>Name</th>
<th>URM</th>
<th>Joined PMCB</th>
<th>Joined MMG</th>
<th>Qualifying Exam</th>
<th>Thesis Defense</th>
<th>Years to Graduate</th>
<th>Mentor</th>
<th>Publications</th>
<th>Thesis Title</th>
<th>Position after PhD</th>
<th>Email</th>
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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)

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<thead>
<tr>
<th>Name</th>
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</table>

<table>
<thead>
<tr>
<th>Thesis Title</th>
<th>Position after PhD</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>A novel CRELD1/VEGF genetic interaction in heart disease and development</td>
<td>Postdoctoral Fellow, Stanford</td>
<td><a href="mailto:jredig@gmail.com">jredig@gmail.com</a></td>
</tr>
<tr>
<td>Genetic Analysis of Chromosome Replication Timing: An Autosomal Locus that Controls Chromosome-wide Replication Timing and Mono-allelic Expression</td>
<td>Postdoctoral Fellow, University of North Carolina, Chapel Hill, NC</td>
<td><a href="mailto:Eric.Stoffrege@gmail.com">Eric.Stoffrege@gmail.com</a></td>
</tr>
<tr>
<td>Name</td>
<td>URM</td>
<td>Joined PMCB</td>
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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

<table>
<thead>
<tr>
<th>Name</th>
<th>URM</th>
<th>Joined PMCB</th>
<th>Joined MMG</th>
<th>Qualifying Exam</th>
<th>Mentor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fletcher, Autumn</td>
<td>N</td>
<td>Summer 2007</td>
<td>Summer 2008</td>
<td>Fall 2009</td>
<td>Gillingham</td>
</tr>
<tr>
<td>Owen, Nichole</td>
<td>N</td>
<td>Fall 2010</td>
<td>Spring 2011</td>
<td>Fall 2012</td>
<td>Olson</td>
</tr>
<tr>
<td>Mitchell, Asia</td>
<td>Y</td>
<td>Fall 2011</td>
<td>Summer 2012</td>
<td>TBD</td>
<td>Spellman</td>
</tr>
<tr>
<td>Juarez, Eleanora</td>
<td>Y</td>
<td>Fall 2011</td>
<td>Fall 2012</td>
<td>TBD</td>
<td>McCullough</td>
</tr>
<tr>
<td>Sunderhaus, Elizabeth</td>
<td>N</td>
<td>Summer 2012</td>
<td>Spring 2013</td>
<td>TBD</td>
<td>Kretzschmar</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

☐ 1. Early Development:
Process is incomplete, omitted dates of meetings or voting record; self-study compiled primarily by program head or a senior faculty member; little faculty and staff input; no input from students or other stakeholders.

☑ 2. Developing:
Process is complete, with dates of meetings and record of faculty vote; but engagement of stakeholders is narrow.

☐ 3. Highly Developed:
Process is complete, with dates of meetings and voting record; engagement of faculty, staff, students and other stakeholders is broad and collaborative.

Reviewer's Comments:
Commendation: Response demonstrates a process for eliciting feedback.
Recommendation: Provide documentation regarding feedback process.

The committee suspects that more is being done to elicit feedback than was clear in this section. In future reports provide examples of the kind of input faculty, staff and students provide and the mechanisms for collecting input.

2. OVERVIEW

☐ 1. Early Development:
Overview is incomplete; program has not created MPGs or MPGs are not aligned with university MPGs.

☑ 2. Developing:
Program has established its own set of MPGs unique to the program, but MPGs are not aligned with university MPGs.

☐ 3. Highly Developed:
Program has established its own set of MPGs unique to the program, AND are aligned with university MPGs and stated clearly and concisely.

Reviewer's Comments:
(The committee chose to award 2.5 points.)

Commendation: The committee stated that the goals were good. They were well developed and specific. Additionally, they said the curriculum description was good.
Recommendation: Demonstrate clearer alignment with OHSU goals; provide a clearer sense of where the program is going strategically. In addition to underlining which areas of the OHSU mission to program aligns with, provide a more analytical response to the alignment.
The committee was unclear about the time-to-degree for this program and also questioned the award of an MS.

### 3. FACULTY AND STAFF RESOURCES

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Early Development:</strong></td>
<td>No discussion of faculty trends that affect program development and faculty diversity; no succession planning (recruitment, retention, retirement, needs) is evident. Temporary/adjunct faculty teach majority of the courses in the curriculum. Program does not avail itself of academic and student services.</td>
</tr>
<tr>
<td><strong>2. Developing:</strong></td>
<td>Discussion of faculty trends; preliminary planning for program development, faculty diversity recruitment and retention. All courses are taught by highly qualified faculty. Program uses academic program services to a limited extent.</td>
</tr>
<tr>
<td><strong>3. Highly Developed:</strong></td>
<td>Explicit planning for program development based on faculty diversity and recruitment/retention needs. Supporting data used in planning. All courses taught by high quality faculty current in the field. Program draws upon relevant academic and student services to increase program effectiveness.</td>
</tr>
</tbody>
</table>

**Reviewer's Comments:**

(The committee chose to award **2.5 points**.)

**Commendation:** Faculty numbers are stable and some growth is apparent. It is clear that URM recruitment is underway. Committee noted one URM faculty member as a positive.

**Recommendation:** Provide more description of what faculty "do" and what they are working on. Be more explicit in describing the budget and funding model. Better align the narrative and data.

The committee felt there were more opportunities for the program to discuss its strengths in this section. They also noted the difficulty PMCB programs have recruiting students to their labs when there are many choices in the PMCB umbrella. Lastly, though URM student recruitment is underway, the committee wanted more detail about the program's strategy for recruiting underrepresented students.

### 4. ENROLLMENT/DEGREE PRODUCTION

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Early Development:</strong></td>
<td>No analysis of program enrollment and degree production in the context of program development, capacity and sustainability. No discussion of student diversity and plans to increase student diversity to achieve core theme objectives. Static curriculum unreflective of changes in the field. Courses are not integrated into a coherent whole and do not reflect student needs. No discussion of curriculum to reflect current practice in the field, changing student needs or changing employment conditions.</td>
</tr>
<tr>
<td><strong>2. Developing:</strong></td>
<td>Curriculum appears to reflect current practice in the discipline. Uses some rudimentary analysis of trends in enrollment and degree production in the context of program quality and sustainability. No discussion of employment projections or prospects for program graduates. Some discussion about student diversity and planning for recruitment.</td>
</tr>
<tr>
<td><strong>3. Highly Developed:</strong></td>
<td>Innovative, dynamic curriculum; program development based on data about student performance and developmental needs. Well-developed and successful plans for student diversity recruitment, retention and success. Data analysis reflects trends and understanding of both internal and external forces. Informed by comparison to peer universities.</td>
</tr>
</tbody>
</table>

**Reviewer's Comments:**

(The committee chose to award **2.5 points**.)

**Commendations:** The program has good strategies outlined for getting faculty to participate on committees. The
committee noted the reference to summer program opportunities for diverse students as a positive. They thought the
graduation rate was good based on the number of students who matriculate into the program annually.

Recommendations: Provide explanation for the enrollment drop from previous years.

The committee noted again that more clarity is needed for time-to-degree and also for the program's current
enrollment.

5. OTHER RESOURCES

☐ 1. Early Development:
No discussion about resource adequacy. No 5-year planning for resources. Does not identify needs or priorities. Does
not identify important contextual factors or extenuating circumstances related to resource planning.

✔ 2. Developing:
Preliminary discussion of the adequacy of resources; no resource planning for or identification of potential new revenue
streams for the next 5 years. Identifies needs or sets priorities, but not linked to data. Limited discussion of context and
extenuating circumstances affecting resource planning.

☐ 3. Highly Developed:
Detailed analysis of resource adequacy for the 5-year period; uses data to identify program needs and priorities.
Developed understanding of unique program circumstances affecting resource needs. Informed by comparison to peer
universities.

Reviewer's Comments:
Commendation: The response in 5.3 was good.
Recommendation: More information and analysis in this section as a whole on the next review.

Questions from the committee: Is Philanthropy a funding source for the program? What competitors does the program
lose students to and how do those competitors' stipends compare to OHSU's?

6. STUDENT LEARNING OUTCOMES AND ASSESSMENT

☐ 1. Early Development: Program-level student learning outcomes vague and not measureable; courses or
experiences required for the degree/certificate are listed but not linked to the SLOs; assessment methods are not
identified; no evidence of faculty engagement in the discussion of assessment results to improve curriculum, academic
support services, faculty development and the like.

✔ 2. Developing:
Program-level student learning outcomes clear and measureable, reflecting three learning domains (Bloom’s taxonomy)
indirect and direct measures of learning are used; faculty committee discusses assessment results and uses results to
improve curriculum and results; evidence of administrative support for assessment and resources for regular data
collection. Some students are aware of the findings.

☐ 3. Highly Developed:
Program-level student learning outcomes are clear and measureable; uses direct measures of learning; courses listed
and linked to SLOs (curriculum mapping); defined levels of learning; assessment results regularly discussed by faculty
committee; evidence of administrative support, use of technology and regular data collection to support assessment.
Most students are aware of the findings.

Reviewer's Comments:
Commendation: Good responses in 6.1 and 6.2.
Recommendation: Provide more information about what alumni are doing beyond the first year out of the program.

Overall the committee wanted more detail/description in this section and wanted to know if the time-to-degree was
improving.
7. OTHER INFORMATION (OPTIONAL FOR PROGRAMS)

- **1. Early Development:**
  Additional information provided about the program did not contribute to the reviewers’ understanding of the program and its effectiveness.

- **2. Developing:**
  Additional information was relevant, but did not contribute significantly to the reviewers’ evaluation of program effectiveness.

- **3. Highly Developed:**
  Additional information enhanced the discussion of specific actions or changes to be taken in the next 5 years.

**Reviewer’s Comments:**

N/A

8. ANALYSIS AND CONCLUSIONS

- **1. Early Development:**
  Discussion of strengths, accomplishments and improvements needed are superficial and not likely to lead to needed improvements over the next 5 years. Neither selected indicators for improvement, nor set targets; plan does not address curricular or program challenges ahead.

- **2. Developing:**
  Reflects spirit of continuous improvement; directions for next 5 years are reasonably developed; selected one indicator for improvement and set a realistic target; Core Themes considered.

- **3. Highly Developed:**
  Reflects spirit of continuous improvement and self-reflection; selected more than one indicator for improvement, but no more than three. Set reasonable 5-year targets for each; specific program/curricular changes are discussed and based on evidence and trends; Core Themes are directly addressed.

**Reviewer’s Comments:**

- **Commendation:** Monthly faculty meetings! In general the committee thought the program demonstrated a strong, solid faculty and evidence of producing “good people”.
- **Recommendation:** Explain how student information/feedback is gathered. Provide an overview of future plans for the program. Identify strategies for recruiting more students and include the faculty's role in recruitment.

9. RESPONSE TO PREVIOUS PROGRAM REVIEWS

- **1. Early Development:**
  Program did not address or implement recommendations, nor give an explanation for not doing so.

- **2. Developing:**
  Program implemented some recommendations. Provides explanation for not addressing all.

- **3. Highly Developed:**
  Program effectively addressed most, if not all, recommendations or incorporated them into its current 5-year plan.

**Reviewer’s Comments:**

N/A
10. OVERALL RECOMMENDATIONS

*Does the sub-committee believe the program meets OHSU academic standards?*

- [ ] Yes
- [ ] No

*Additional comments for Faculty Senate consideration.*

The committee wanted more detail and information about the program in the report. They felt the program was doing more in all areas than what was documented.