Review Report for the Molecular Medicine Training Program
November 21, 2011

Review Committee and Process
The review committee was chaired by Patrick Stayton, WRF Professor of Bioengineering at UW, and had as an external reviewer Dr. John H. Nilson, Edward R. Meyer Distinguished Professor and Director, School of Molecular Biosciences, Washington State University. The review took place on October 17, 2011. The committee met with the program Co-Directors, the MMTP Executive Committee, Deans, Chairs, Division Heads, program faculty, program students, Anh-Chi Le of HHMI, and Pat Gray (Accelerator Corp.) who co-developed one of the program's courses.

Charge and Questions Addressed
The committee's charge was to assess the program's quality, educational value, role within the University and community, role within the academic discipline, and resource requirements. The questions the review was asked to consider included:
1) Is the program doing what it should be doing?
2) Is the program doing it well?
3) How can the program do things better?
4) How should the University assist the program?

The MMTP had identified the following specific questions:
1. How broad is the impact of our program, in terms of numbers of students, departments and interdisciplinary programs involved?
2. What is the quality of our courses and our training program, and where is the need or room for improvement?
3. What is the value to the students of Molecular Medicine training?
4. What roles are we fulfilling in the university? Which of these roles is unique?
5. What resources are we using? How effectively are we leveraging those resources? How can we ensure that we continue to be self-sustaining in the future?
6. What do we anticipate will be the future role of Molecular Medicine Certificate Training? Would an interdisciplinary PhD program in Molecular Medicine (to complement, not replace the Certificate Program) benefit the institution and our trainees?

Finally, the reviewers were asked to address the following additional points.
1) Discussion of a possible PhD program can be integrated into the self-study as part of the discussion of the certificate program's future directions, including how moving in this direction might impact the certificate program.
2) Provide information on the sustainability of the certificate program with regard to current and future resources.

Review Findings

The Graduate Certificate in Molecular Medicine is administratively housed in the Graduate School and is overseen by the Molecular Medicine Interdisciplinary Group consisting of UW Graduate Faculty. The certificate program was approved by the Board of Regents in November 2005, and this was the program's mandated initial review. The unit defines the area as follows: "Molecular Medicine is an interdisciplinary approach to human biology and disease that integrates and applies advances in the basic biomedical sciences and in biotechnology to understanding, diagnosing and treating human disease." We believe that the program is an excellent connection between fundamental health science research and the clinical viewpoints found in clinical departments and clinicians themselves.

The review panel found the MMTP to be off to an outstanding start and having excellent impact. It should continue in its current format and we found a few places where the program might evolve to an even stronger program. The review also considered the possibility of creating a Ph.D. program as a new offshoot of the MMTP and we found considerable merit to this possibility. That evolution is considered at the end of this report.

The MMTP co-Directors have done an outstanding job in building the certificate program and are a principal strength in its continued evolution. They are committed, passionate, and effective in their leadership, and at a very tough time have done a remarkable job in building the outside financial resource base for the program. They should be commended for their success in obtaining two cycles of funding from the HHMI and for securing a training grant from NIGMS. This success and external validation highlights the importance of Molecular Medicine Training Program and its pedagogical basis.

There is also an exceptional executive committee that is very involved in the program and providing a broad inter-departmental support network for developing curriculum and the direction of the program. There was a clear message from this top faculty group that these sorts of inter-departmental graduate training models are needed, impactful, and necessary for the continued strength of UW graduate training. There is clear support from key chairs of clinical and basic science departments including their willingness to provide financial support.

The MMTP offers a unique training curriculum that combines PhD mentors with Clinical Mentors. There has been outstanding curriculum development and the leadership should be commended for developing impactful and well-designed courses and making them available to the wider university audience. Students are enthusiastic about the program and feel that the added curriculum was beneficial and not a burden. The Clinical Genetics course is especially impressive and provides a unique clinical experience for PhD. Students universally note that this is a draw and highlight. The capstone presentation provides a unique opportunity for students present their research to a general rather than specialized audience. A requirement for competency in statistics adds another unique program commitment for students in most graduate programs. The student feedback to our committee validated the idea that the MMTP

program offers a valuable education option that helps recruit new students into the existing PhD programs.

The training faculty the review committee met with were similarly enthused about the program and the impact on their students and their research. They felt that the certificate curriculum was not an added burden and fit naturally within their student's curriculum. They also felt that though the program was still fairly new, that the perspective and connections of clinical faculty were proving useful. They had experienced or were expecting impacts on their own research programs from these new connections.

Concerns and risks

The primary concern of the review panel was not with the program per se, but with the sustainability of the financial model when support from HHMI ceases—this places the current certificate program at considerable risk. While it is clear that there is philosophical support for MMTP and similar interdisciplinary programs from the School of Medicine, direct financial support is likely needed to complement the excellent support from departments such as Medicine and others.

Some more minor places where the program could become even stronger were noted. The Executive Committee would benefit from inclusion of student representatives. Students should also be given the opportunity to lead selected program initiatives, i.e. make the program more student driven and student led. There could also be more structured advising and monitoring of student progress from the MMTP leadership team. This could include annual meetings that review student progress and performance. Capstone presentation could benefit from more formal feedback mechanisms. Acceptance into the program would benefit from a direct, personal touch, i.e. students need to know immediately when they are accepted into the program. Student participation in the capstone presentations, other than the speaker, is spotty. All mentors should be encouraged to attend as many capstone presentations as possible.

Future Directions and Potential Impacts on Research Activities in the SOM at UW

The existing Certificate Program provides a timely pedagogical framework for creating a new interdisciplinary Ph.D. program in Molecular Medicine. A new Ph.D. program has the potential to offer patient oriented research experiences earlier with a more focused curriculum yielding an even higher impact. Discussions with HHMI and support from NIGMS validate the interest and need for such a program that should increase the effectiveness of recruiting graduates that are currently not captured by the existing Ph.D. programs in the SOM at UW. A Molecular Medicine Ph.D. program also has the potential to provide a great bridge between the MSTP and existing graduate programs in the SOM. This in turn would expand collaborative opportunities between clinical and basic scientists.

The design of a new Molecular Medicine Ph.D. Program needs to include a clear vision that

highlights the unique attributes of the program and how it meets current unmet need. While there is evident broad buy in from the MMTP leadership and Executive Committee, success will require that the upper administration view this as potential flagship program along with the willingness to provide the necessary financial support for initiating the program. In this regard, it is important to recognize the success of the PI and Co-PI in attracting outside support that has brought the current Certificate Program to its current level of accomplishment. This inspires confidence that support provided by the SOM can be leveraged with additional outside support as the program grows and expands.

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