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RE: Department of Pharmacology Program Review

Dear Dr. Slattery,

We have completed our review of the Department of Pharmacology's Graduate Program. This program typically leads to a PhD degree in Pharmacology, and our review focuses on this pathway. Rarely, a student elects to complete a M.S. in Pharmacology, but we have not reviewed this program, since it is not viewed as a major goal of the graduate program. Our report is based on a detailed self-study document prepared and provided by the Department and a site visit (agenda attached) that included the participation of an external reviewer, during which we met with faculty, students and postdoctoral fellows in the Department. Our specific recommendations are listed after each section.

GENERAL

When the Department of Pharmacology was last reviewed, ten years ago, the report noted that it "is a thriving and well-run department" with "an outstanding faculty", and "whose ... success is due, in significant measure, to the thoughtful and vigorous leadership of its present chairman." These statements apply equally well, if not more so, today. Overall, the committee found the Pharmacology Department to be one of the strongest of the basic science departments in the Medical School.

The department has a well-deserved reputation nationally for the quality of its research programs. Most research programs are focused at the cellular and molecular levels of analysis, and span topics ranging from embryonic development to signal

transduction pathways to neuronal circuits to properties of receptors and ion channels. The departmental faculty as a group is weighty, containing a Hughes Investigator and several members of the National Academy. Dr. Catterall has been active in national societies and is highly regarded as a leader and visionary in the national pharmacology and neuroscience communities. It is puzzling, however, that more overt effort has not been made to partner or collaborate with companies in the Seattle biotech industry. Intellectual property issues (publication, etc.) are a concern but can be managed. Jobs in this sector are sure to become even more attractive to future graduates of the department. Overall, the research environment provides a superb foundation for graduate education.

THE GRADUATE PROGRAM

In our meeting with Dr. Catterall, he articulated his vision for graduate education within his department. The department of Pharmacology recruits students directly, as well as through the interdisciplinary programs in Neurobiology & Behavior and Molecular & Cellular Biology. Dr. Catterall feels that the presence of both departmental programs and interdisciplinary programs represents an excellent balance for training students interested either specifically in a career in pharmacology or alternatively in a broader interdisciplinary approach to their education. The program of study for the departmental students includes specific graduate level courses that train them for careers in either a University setting, or in a Biotech or industrial pharmacology pathway. The students that are recruited through one of the interdisciplinary programs, by contrast, are more directed towards a career in an academic setting, and follow their unique program requirements, rather than the Pharmacology graduate program requirements.

The department has maintained a very good graduate program since the last review. The committee interviewed students that were recruited into the Pharmacology graduate program, as well as students that were part of one of the interdisciplinary programs, working in Pharmacology department labs. We found both groups of students to be satisfied in large part with the quality of their education. They were all particularly impressed with the high quality of the research programs of the faculty in the department and the state-of-the-art research training they were receiving.

Specific Recommendation

** The Department of Pharmacology should continue to train students for the PhD degree in Pharmacology for another ten years.*

Despite these clear successes in the Department of Pharmacology, there are some important challenges ahead for its graduate program. We have identified four primary areas where the Department should focus its attention in its future plans.

Career development issues.

The Committee found that many students in the Department felt that they were not being adequately exposed to the various career options available to those with a Ph.D. degree in Pharmacology. Although most of the faculty we interviewed stressed the fact that many of the departmental students have gone on to careers in academic Pharmacology departments in various universities, many of the current students in the program do not have this ambition. Instead, they are interested in a range of potential careers, from involvement in directing clinical trials, to regulatory affairs. Most of the senior students we interviewed were not planning on pursuing postdoctoral studies. There was also a sense of frustration with the length of time that the "traditional" career path takes, and this may be part of what has led to a more active consideration of alternatives in these students. With postdoctoral positions lasting five years or more, the absence of teaching opportunities may be unconsciously shifting postdocs away from academia and towards industry because their skills become more and more focused on research.

In the past few years, the department has become increasingly aware that this is an important issue. As the appended letter of Dr. Catterall reviews, last year the department included speakers from the biotechnology and pharmaceutical industries in their seminar series and provided opportunities for them to talk with students about non-academic career options. In addition, the students in the department have participated in organizing a Career Day, in which scientists from several different companies lead group discussions with the students about careers in industry. These efforts are to be applauded and their continued development will undoubtedly strengthen the graduate program. In addition, the department should expand these efforts to include a wider range of alternative careers. Many of the students in the program specifically mentioned the seminar series that has been organized by the students in the Medical School "What can I do with a Ph.D.?" as an informative forum, that could serve as a model for the departmental efforts. Although the faculty generally asserted that they were supportive of all career options, students interviewed indicated that they felt they were regarded as failures by faculty for having chosen non-academic career options. The faculty of the department needs to be supportive of the wide range of options that the students would like to explore, and need to do a better job of communicating this support to students.

Specific recommendations.

**The recently developed Career day should continued to be offered by the department.*

**The faculty need to do a better job of communicating their support for a wide range of career options that the students would like to explore.*

**The School of Medicine should bring in scientists working in a wide range of areas to discuss their career choices, similar to the student-run "What can I do with a Ph.D.?" series run this year, to serve all graduate students in the basic sciences.*

Teaching experiences

In our review of the departmental program, another area of concern of the students was the issue of their teaching experience. Currently, the Pharmacology students are required to serve as teaching assistants for three quarters in small group discussion labs/classes composed primarily of pharmacy students. None of the students we interviewed felt that they had adequate training in instruction. Two considerations are important for the department to appreciate in order to implement any changes to the current program. First, the students felt they needed faculty feedback on their performance. Currently they only obtain feedback about their performance from the student evaluations. Other departments have implemented a policy in which the faculty involved with the course attend one or two of the TA-run sections and provide direct feedback to the TAs in oral and/or written format. Such a policy should be considered by the Pharmacology Department. Second, although the students TA for three quarters, some of the students did not feel that the nature of the lab/discussion sections in their present configuration, represent a substantial enough experience for developing their skills. There are several options to address this issue. First, the students should receive formal training in instruction prior to their TA year. Second, the TA experience could be expanded to involve the students in giving lectures in pharmacy classes for those students that are specifically interested in career paths that may require more formal experience in instruction.

In addition to the TA experience, the students felt that they needed more opportunities to present their research in seminars. After the first year rotation talks, they have few formal chances to give a research presentation to the department. At least some of the students, and most of the postdoctoral fellows, felt that this would be a very useful adjunct to their training. This would be particularly useful if there was some expectation that they would be provided with feedback from faculty that would help them improve their abilities.

Specific recommendations

** A member of the faculty should attend at least one of the lab/discussion sessions for each TA, and provide an oral and/or written evaluation of the TA's performance, preferably early enough in the quarter so that the student has an opportunity to improve*

** The students should receive formal training in instruction prior to their TA year*

** The TA experience should be expanded to allow students to give lectures in pharmacy classes for those students that are interested in career paths that may require more formal experience in instruction*

** Extend the weekly departmental seminar series through the summer, so that postdocs can take ~ 12 slots each year.*

Communication/ Inclusion Issues

The maintenance of effective open communication among the members of a department that is as physically dispersed as Pharmacology is a challenge. Perhaps the most significant change in the department since its last review has been the expansion of the department to the K-wing. In addition, the Department is currently composed primarily of full professors, with three assistant professors hired in the last few years. These factors may have contributed to the perception in some of the students that they do not have a clear and open line of communication with the Chair. For example, while students' opinions on new hires are apparently solicited informally, many students were not aware of this and felt that the faculty did not consider the students' opinion. While the previous review recommended that students participate in departmental governance, only recently have graduate students been given any role in decision making, with a student representative on the curriculum committee. In addition, the current makeup of the faculty can be a bit intimidating to the junior faculty, and the Department needs to make sure that the voices of its new recruits are being heard, particularly in decisions that impact its future directions. The current junior faculty, after all, represent the future of the department. While Dr. Catterall has highlighted his efforts to provide the students and Junior Faculty with opportunities for involvement in departmental governance, it is the recommendation of the committee that the Department look for additional opportunities for interactions among its members at all levels.

Specific recommendations

** The role of graduate students in departmental governance should be enhanced, with student representatives on more committees (where appropriate). The department should consider letting a student representative participate in the parts of faculty meetings dealing with specific student issues where student input would be helpful to the decision making process.*

** The department should encourage the formation of a student organization that will meet periodically and communicate to the Chair issues of importance to students. During recruitment of new faculty, the students could discuss the various candidates and provide a summary of their opinions to the faculty.*

** The junior faculty should be encouraged to voice their opinions and to actively participate in departmental decision making*

Impact of the Interdisciplinary Programs

The last ten years has brought a significant change in the way in which many graduate students are trained in the Biomedical Sciences at the University of Washington. The interdisciplinary programs that existed in 1990 have gained degree granting status and new interdisciplinary programs have been initiated. What has been the impact of these programs on the Department of Pharmacology's graduate program? The faculty in Pharmacology consistently highlighted the differences in the students that are accepted into the departmental program and those that were admitted through one of the interdisciplinary programs. In our interviews, we found that while the two groups of students have much in common, the Pharmacology students appeared to have a more definite focus to their education, and appreciated the additional depth in their training that they could get from a departmental program. The departmental students were more likely to be considering a non-traditional career pathway. By contrast, the Molecular & Cellular Biology and Program in Neuroscience students we interviewed were in some ways much broader in their thinking and appreciated the open design of the interdisciplinary programs. In general, they were more likely to be considering a more traditional academic science career path, which includes postdoctoral training.

Although several faculty of the department indicated that the departmental program had not suffered as a result of the growing success of the interdisciplinary programs, the committee noted several recent developments which may cause concern if they represent a continuing trend. First, in the past few years an increasing number of departmental students have left the department before completion of the program. While a certain amount of attrition is to be expected and is common to all graduate programs, the program has fewer students enrolled today (33) than at any other time during the past ten years (average 43). Second, the committee noted that the interdisciplinary program students interviewed were more likely to choose an academic career path, while the departmental students were less likely to choose this path. Since the faculty places a priority on this career choice, this could affect the way the faculty treats the departmental students. These issues are presently concerns that do not require immediate action; however, we regard the department of Pharmacology graduate program to be one of the strongest in the basic sciences within the School of Medicine, and may in some sense be considered a bell-weather for this issue throughout the School.

SCHOOL WIDE ISSUES

Faculty in the Pharmacology department strongly emphasized the need for improved and expanded core facilities to enhance research, from better transgenic mouse facilities to an array analysis center. Dr. Dorsa is doing an impressive job in trying to coordinate all of this, but the committee felt that he was overburdened with too many responsibilities. At Emory, for example, the Associate Dean for Research in the SOM chairs a Research Advisory Committee (RAC), one of the main jobs of which is to coordinate and develop core facilities. Other functions of the RAC are to help coordinate large center grant and program project grant applications, and to organize efforts to

attract larger institutional infrastructure support. There are separate Associate Deans for Graduate Education and Medical Education, relieving the Associate Dean of Research of these responsibilities. The committee felt that it would improve the research climate throughout the biomedical sciences if Dr. Dorsa could be relieved of some responsibilities in order to concentrate his efforts on improving the infrastructure. The committee strongly recommends that the School of Medicine appoint a part-time dean in charge of graduate education. The responsibilities of this person would include running the annual Biomedical Integrity series, running an annual career development series as well as working to coordinate and enhance the teaching and research in the interdisciplinary programs. Interdisciplinary programs are likely to continue to flourish and to be one of the best ways to recruit graduate students in an increasingly competitive market. There are likely to be very good reasons to create new graduate programs in the future to take advantage of changes in science and areas of new strength at the U.W. The recently created Biomolecular Structure and Design program is an excellent example of this. The proposed dean would be a person that faculty could contact to discuss issues of feasibility and financing and who would help to coordinate different departments to bring new interdisciplinary programs on line.

Specific recommendations

**Creation of a part-time dean to oversee graduate education and the interdisciplinary programs.*