

Department of Physiology and Biophysics Program Review

I. Committee

Rachel E. Klevit, Department of Biochemistry (Chair)
James J. Champoux, Department of Microbiology
Charles Chavkin, Department of Pharmacology
Richard Aldrich, Department of Molecular and Cellular Physiology, Stanford Univ.
Richard L. Moss, Department of Physiology, Univ. of Wisconsin

II. Summary of Review Process

The Review Committee was formed and its membership finalized in early February 2005. Support materials (listed below) were delivered on April 7, 2005.

The Review Committee was provided with the following materials:

1. Guidelines for Program Review Committees
2. Copy of the Previous Program Review Report (1995)
3. Chair's Response to Report (1995)
4. Letter of official Administrative Action (1996)
5. Summaries of Exit Questionnaires from Masters and Doctoral students
6. GSR reports for departmental graduate students (General Exam and Final exam reports)
7. Departmental Self-Study document, describing the degree program and including supporting data such as faculty CVs

A meeting to review the charge was held on April 11, 2005, attended by two Review Committee members (Rachel Klevit, Biochemistry and Charles Chavkin, Pharmacology), Elizabeth Feetham, Acting Dean, The Graduate School, Susan Jeffords, Vice Provost for Academic Planning, Office of the Provost, Sheila Lukehart, Assistant Dean, Research and Medical Education, School of Medicine, and Gail Dubrow, Associate Dean, Academic Programs, The Graduate School. An official Charge letter was received by the Review Committee following this meeting.

The Review Committee held a two-day Site visit on May 3-4, 2005 during which the Department Chair (Dr. Stanley Froehner), Chairs of various Departmental Standing Committees, small groups of faculty, graduate students, post-doctoral fellows, undergraduate student, and staff were interviewed. Following a closed Review Committee Executive session, exit interviews were held that included Drs. Froehner and Rieke and representatives from various administrative units (see list from Charge meeting, above). Based on the written record and information gathered from the Site Visit, the Review Committee makes the following Findings and Recommendations. All members of the committee are in concurrence with this report.

III. Findings & Recommendations

A. General Departmental Issues

1. Department's rank and status among peers. The Physiology & Biophysics Department ("PBio") enjoys a stellar reputation among Physiology departments both nationally and internationally. This is richly deserved on the basis of past contributions to the field of physiology and particularly in neuroscience, cardiovascular physiology, and biophysics; on current strengths in neuroscience and biophysics, and recent successes in recruiting outstanding entry-level faculty. Both the NRC and the NIH consistently rank the Department among the top 10 departments nationally, which indicates that its superb reputation is won both through the favorable impressions of peers and on the basis of quantitative measures of productivity, impact, and accomplishment. Over the past 50 years, few departments have achieved at the level of PBio faculty, who have made seminal contributions in research, authored leading textbooks in biophysics and in medical physiology, and trained numerous students and post-doctoral fellows who have gone on to independent positions and leadership posts in first-rate academic institutions. The basis for the successes of the Department are no doubt multi-factorial, but it is evident to the review committee that PBio has enjoyed exemplary leadership from previous and current Departmental Chairs, high-quality faculty who are both interactive and mutually supportive, a vigorous graduate training program, and a staff that is extraordinarily skilled and committed to the success of the Department.

2. The department has suffered from sub-optimal space, both in terms of the actual space, which is old and in serious need of renovation, and because the department is spread out in several wings and buildings. The future in this regard looks promising, with a recent award from NCRN and matching funds from the SOM to renovate the department's space. Reallocation of space within the SOM pending the Department of Genome Sciences' move to a new building and the Dept. of Microbiology's move to J-wing will allow for consolidation of space to provide contiguous lab space (albeit on multiple floors). This will greatly enhance departmental activities and facilitate communication and collaboration. Contiguous space will enhance cohesiveness and collegiality that should facilitate the functioning of the program. We applaud this development and recommend that the process be allowed to proceed with all due expediency.

3. The Research Professors at all ranks are viewed as an integral and important facet of the department. We were surprised to learn that some of these individuals are not provided with office space, other than a desk in a lab. The lack of office space reduces the effectiveness of these individuals. We encourage the department to alleviate this situation in the new space plan.

4. In the current departmental space, there is nowhere available for informal gathering. Such a space can enhance communication and foster collegiality at all levels. We would encourage the department to try to identify space in their renovation plan to set

aside for informal activities. One way to capture some space is to reconsider the need and use of a departmental library, as these are becoming obsolete, or at least considerably scaled back, with online books and journals.

5. The integration and synergy of PBio and the Regional Primate Center is viewed as a strongly positive aspect and the relationship should be continued and even strengthened in the future. In this regard, recruitment of a new Director of the Primate Center is critical. We believe that the close relationship of the Center with PBio is a strong selling point and efforts to strengthen these ties, perhaps via PBio appointments for relevant members of the Primate Center, could help to recruit an outstanding individual as the next director. Success in this search is key to the continued success of a substantial number of PBio faculty whose research is focused on the neurobiology of behavior in awake, non-human primates. The work of these faculty is done at a systems level that is highly integrative of neuroscience research both in PBio and other departments and programs on campus, which contributes significantly to the uniqueness and overall high stature of the PBio Department and of the University of Washington in the field of neuroscience. Consistent with this assessment, we encourage the University to allocate the resources necessary to recruit a first-rate scientist and leader as Director of the Primate Center.

6. The department is viewed as a very collegial and interactive group at levels that include faculty, staff and trainees. Departmental activities such as the annual retreat were uniformly praised. The Departmental seminar series is still viewed as somewhat sub-optimal in terms of attendance. The broad interests of the department mean that not every seminar will be of interest or relevance to a given individual. Nevertheless, attendance should be strongly encouraged by the Chair and faculty to promote a culture of participation across the department. Recent efforts by the seminar committee to schedule seminars at regular times and places should help in this regard. The small seminar room was cited as a disincentive by several individuals. Although it does introduce an activation barrier, holding seminars in a larger (non-Departmental) room should be considered, which might necessitate moving the seminar time to an afternoon time slot to avoid classroom scheduling conflicts. Another area where departmental participation could be improved is attendance at Ph.D. thesis defense presentations. Again, development of a culture in which all members of the department participate is encouraged. Given the small number of thesis defenses that must occur each year, regular attendance is not an onerous responsibility and it definitely generates good will between faculty and students.

7. The shared Keck imaging facility is viewed as providing important resources for the department and the larger research community. The center has had difficulty obtaining funding to purchase and upgrade its equipment because of the constraints placed on re-charge centers. A more pro-active strategy towards investing in state-of-the-art equipment, and better funding mechanisms to provide support in a timely fashion is needed to maintain the high standards and relevance of this Center and others to the PBio faculty specifically and the University research community in general.

B. Educational Issues

There is a large and significant presence of PBio in the Interdisciplinary NeuBeh graduate program, and vice versa. Many PBio faculty teach NeuBeh courses, a PBio faculty (Dr. Mike Shandlen) is co-director of the NeuBeh program, and close to half of all graduate students in PBio research groups were admitted through the NeuBeh program. This raised the question as to whether the PBio graduate program has become redundant; it most emphatically has not. The PBio program recruits from a different pool of students, most notably from a quantitatively-trained population of undergraduates including Physics majors. These students are attracted mainly to the more biophysical of the research groups in PBio and they would not be attracted by the NeuBeh program. We recommend that the PBio graduate program continue and that it concentrate on building on its historical strengths in quantitative biophysics. Recruitment at the currently targeted level of 5-7 students/year is appropriate in view of the training capacity of faculty laboratories.

1. The graduate-level course offerings in PBio are heavily weighted towards topics related to Neurobiology. While this serves a segment of the students well, a clear distinguishing feature between the PBio graduate program and the NeuBeh program is PBio's activities in "non-Neuro" areas. We recommend two strategies to diversify the course offerings. First, the dept. should explore the option of teaching a non-Neuro-based physiology course that some students would take in the first year in place of NeuBeh502 and/or 503. This would serve both to provide a more diverse educational opportunity in physiology to PBio students and would better prepare them for their roles as Teaching Assistants in the PBio course during their second year. Second, mini-courses should be developed to provide better coverage for other systems. Participation by members of PBio's Joint faculty would serve both to bring them more into the teaching activities of the department and to take advantage of the diversity of expertise they represent. To achieve this latter goal, steps may need to be taken by the Chair to decrease the impediments, real or perceived, that some Joint faculty (especially those in clinical departments) experience to teaching in a PBio course. The perception that teaching should only be done by state-supported faculty needs to be dispelled; all faculty engaged in graduate student training should be encouraged to participate in graduate student teaching (which is distinct from 'service teaching' for health professional students).

2. There was a general desire among the graduate students we interviewed for more oral presentation opportunities where they received detailed feedback from faculty. Bertil Hille does an outstanding job of providing this to the postdoctoral fellows, and the review committee members were extremely impressed by the dedication to teaching and leadership-by-example that Dr. Hille provides. We recommend adopting a similar format to the seminar series currently run for post-doctoral fellows by Prof. Hille for all students who have passed their General Exams. Depending on the number of students in the department, one or two quarters of a course in which students present their research and are provided with feedback about their presentations would provide an

annual opportunity for each student to hone their speaking skills prior to defending their thesis.

3. The Committee heard a level of concern among students concerning their choice of lab rotations: some students had had difficulty finding labs in which to rotate. Effective graduate student recruitment in future years requires that the current students feel they are being treated fairly in thesis lab assignments. The department's plan to institute a "matching" program for incoming PBio students to facilitate placement of students in their first lab rotation will do much to alleviate the concerns raised. Additionally, ensuring that as many faculty as possible take rotation students in the Autumn quarter is encouraged; it is difficult to imagine that any PBio faculty's teaching load is so onerous as to keep them from taking a rotation student. We would also encourage a system in which students may not choose their thesis lab until the end of Spring quarter of their first year. In this way, all students are on a fair playing field, and it alleviates the sense that a student must get into his/her first choice lab during Autumn quarter in order to have a chance in joining that research group.

4. There is a fairly laissez-faire approach to providing information to students who are serving as teaching assistants regarding teaching strategies and approaches. Students in their second year are expected to TA in a general physiology course without necessarily having taken one previously. Even in their first teaching experience, students seem to be left mainly to their own devices, making the experience an overly stressful one. Furthermore, as each TA is expected to prepare his/her own teaching materials, there is concern about the lack of consistency between sections of the same course. The plan to appoint a Head TA from the previous year's group of TAs to act as a consultant and guide is a good one. To ensure its success, however, the responsibilities of the Head TA should be clearly defined and should include development and dissemination of teaching materials such as hand-outs, to be used by all the TAs for a given course. In addition, providing a graduate-level, general physiology course for the first years students would help ensure that the TAs are better prepared and that the non-neurobiology-oriented graduate students get the broader training they need.

5. The department has recently developed a set of clear, written guidelines for student progress assessment and has established committees to monitor student progress. These activities are to be encouraged. In particular, a more active role in advising first-year students, especially in course selection and lab rotation selection should be taken by the Graduate Student Academic Advising Committee. A student handbook that is kept up-to-date with information about the program's requirements, timelines, guidelines and expectations for the General Exam, etc. should be made available to PBio students on the departmental Web page.

6. The department is doing a good job at providing support and information to students about career options. We encourage continued support of the "What to do with a Ph. D. in Science" series, as this was praised by the students we interviewed. It is important that all faculty recognize that some successful graduates will use their research training

and critical thinking skills in non-academic or non-research settings. Students choosing such career paths benefit greatly from the training they receive and they also need to be valued and respected.

7. The department's efforts to increase diversity among its graduate students are to be applauded. The relationship with the Univ. of Puerto Rico (via Dr. Santana) provides a unique opportunity to attract under-represented minority students to pursue research in the department. The summer research internships funded by departmental funds are an excellent outreach program. These efforts should really be SOM-wide, not departmentally based, and should be supported by institutional funds.

8. We recommend that the department institute a requirement that all its graduate students attend the SOM's Scientific Integrity & Ethics course. Although currently, students on any NIH training grant are required to take the course, the information disseminated is relevant and important to all graduate students. For example, students coming from other cultures may have a different concept of plagiarism and data-integrity, as these concepts and expectations are somewhat culturally defined.

C. Faculty & Staff Issues

We heard uniformly strong praise for Prof. Froehner, Chair of PBio. He is to be congratulated for the smooth transition from the long-standing leadership of Dr. Wayne Crill. There is a strong collegial environment in the department and the morale of the faculty is high, at all ranks. Prof. Froehner's egalitarian mode of governance creates an atmosphere of inclusion and respect at all levels, including students, post-doctoral fellow, faculty, and staff. The PBio support staff has an amazingly low attrition rate, with several staff members having stayed with the department for over 30 years. There was unanimous praise for the staff and its professionalism. Faculty and students alike appreciate the effective facilitation and support that the PBio staff provides.

1. Since his arrival in 2000, Dr. Froehner has had outstanding success in recruiting junior faculty. The high quality of the individuals hired and their diversity are both noteworthy. Given the career stage demographics of the department, continued efforts to recruit beginning stage faculty are recommended. Success in this effort will require that Dr. Froehner have the resources necessary to continue to attract the top talent in the areas of Physiology & Biophysics.

2. We recommend that future hiring efforts continue to build on the strengths of the PBio department, past and present. Quantitatively trained scientists working on state-of-the-art problems should be sought. The department is encouraged to continue to rebuild its strength in areas relevant to cardio-vascular physiology; the hiring of Dr. Santana is an excellent start and the momentum that he provides should be capitalized on to attain critical mass in this area. The department is encouraged to seek out individuals pursuing disease-related research, as this is a direction that is likely to be increasingly important and attractive in the future both nationally and locally and is resonant with strengths within the SOM.

3. As mentioned earlier, PBio has significant teaching and leadership presence in the NeuBeh graduate program. Efforts in this and other interdisciplinary programs are deemed meritorious and participation in them “counts” toward issues such as promotion. Given the highly symbiotic relationship between PBio and NeuBeh, this practice should continue.

4. Mentoring of junior faculty is clearly given importance within the department; Assistant Professors have both formally assigned mentors as well as a number of informal mentors that develop relationships due to shared research interests. The junior faculty are well versed in the requirements and expectations for tenure and promotion. Peer review of teaching is practiced and constructive feedback is given. The department provides an environment of support and it is clear that their goal is to facilitate the success of each of its junior faculty members.

IV. Conclusions

The Department of Physiology & Biophysics plays an important role in the educational and research missions of the University of Washington. While taking an active, and in some cases, leading role in several Interdisciplinary training programs, it maintains its own distinct identity within the School of Medicine. Its graduate program attracts a unique group of students with backgrounds in quantitative fields such as Physics who have an interest in pursuing research in biomedical sciences. Continuation of its graduate program is recommended with enthusiasm. Faculty from PBio also participate in the undergraduate Neurobiology degree program, a competitive major that attracts extremely high-quality undergraduate students. The department is also critical to the functioning and strength of the Regional Primate Center.

The Department enjoys an international reputation for excellence in research and training of future leaders in the field. Under the leadership of Dr. Froehner, the department continues its success at recruiting outstanding new faculty members who are at the top of their peer groups. The ability to maintain its justifiably high position among its peers will rely on a continuation of this outstanding record. Such an effort requires the institution to provide the resources and space necessary to attract and retain highly sought-after individuals.

The Department is to be congratulated for its efforts in outreach and recruitment of under-represented minorities. However, this issue is much wider than at the departmental level and can only be appropriately and adequately undertaken at the institutional level. PBio should continue to foster its relationships with other departments and universities from which potential minority trainees can be identified and recruited.