

2008 Decadal Review Report
Response to the Department of Biology

University of Washington



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Introduction

We received the Decadal Review of Biology from Professor Dennis L. Hartmann on 20 June 2008. After studying that Review and drafting a response, we made both the Committee Report and our draft Response available to the Executive Committee of the Department and solicited their views. This document includes their recommendations.

We thank the Review Committee for their insightful, constructive, and supportive Report. They have done an outstanding job not only of critically assessing the strengths and weaknesses of the Department, but also of making constructive and thoughtful suggestions that can help guide our future development. In fact, we have already begun implementing several suggestions.

We have organized the sequence of topics in this Response to follow the sequence in the Report. Where we agree with the Report's comments and recommendations, which is usually the case, our comments are brief.

1. General Structure and Organization of the Department (Report p. 2)

The Report encourages continuation of the Executive Committee, which is composed of the senior faculty who oversee the major committees, the departmental administrator, and the chair. This Committee meets weekly during the academic year and serves as a useful forum for debate, evaluation, and broad perspectives. We definitely concur that the Executive Committee plays a positive role and will facilitate the transition to a new Chair. It is being continued.

The Review Committee notes the ratio of undergraduates to faculty is unacceptably large. This ratio reflects a long-sustained increase in the number of undergraduates as well as the recent loss of some key junior and mid-career faculty to other institutions, plus losses from normal retirements. The Review Committee recommends that the University needs to provide the Department with additional resources, or else the Department will not be able to remain a premier program in biology.

We definitely agree that faculty staffing is at a critical juncture. Of course, we are delighted that undergraduates are increasingly attracted to our biological programs, and we continue to work hard to provide them with solid, broad, and innovative educational opportunities that promote their careers. But because we have not received a compensatory increase in the number of faculty and staff, the resultant teaching workload per FTE is an unacceptable burden and has been so

for many years. As a result, our teaching effectiveness is inevitably compromised, and we risk losing more faculty to other institutions with less onerous teaching and administrative loads.

There are only two solutions. 1) We can cap the major. However, we don't want to do this because we do not want to deprive UW undergraduates the opportunity to pursue the program of their choice. 2) We could hire more faculty and staff. This is probably the ideal solution, but financial reality suggests that we will have to accept some combination of the two. In any case, implementing these solutions (singly or together) requires continued support from the College and the University. Fortunately, the College of Arts and Sciences is now providing us with exceptional help and encouragement.

2. Faculty Quality, Mentoring, Recruitment and Retention (p. 3)

Faculty Quality. The Report highlights here a critical challenge, namely, the costs and difficulties of luring and of *retaining* top young faculty. We too are deeply concerned with the escalating costs of start-up packages: in fact, start-up requests from this year's recruitment class averaged roughly \$0.8 million each, though fortunately the final negotiated packages were less! But even the final packages are double those of recent years. Obviously, any continued escalation of start-up packages will stress our ability to hire two to three faculty per year and reduce our competitiveness in those attempts.

Dean Cauce recognizes this challenge and has changed the funding algorithm for start-up, so that departments now need to contribute only 1/3 of start-up costs. This is a great help, but the Department needs to continue to be cautious in balancing resource allocations to start-up versus other critical needs.

A related and serious issue is the senior-heavy age structure of the department. About 1/3 of our tenure-track faculty are ≥ 60 years of age, and we have relatively few Associate Professors. Consequently, we will likely experience many retirements over the next 5 to 10 years (and thus need to make many hires just to stay even) and suffer an attendant loss of leadership and experience. The Review Committee was sensitive to these demographics and advocated targeting some job searches towards "younger tenured Associate professor appointments, particular in regard to women and under-represented minorities."

We too have been keenly aware of the Department's unstable age structure. In fact, this past year we specifically searched for a senior position and are now attempting to make this hire (Professor level). We also have a tentative

acceptance from an Associate Professor (from the University of California system) for the Associate Directorship at the Friday Harbor Laboratories and a joint position in Biology and in SAFS. This coming year we will again search for at least two positions, most likely at the junior position; but if we find another outstanding mid-career biologist, we will make a strong case to the Dean to support this hire. We agree with the Committee that the need is justifiable.

We are also concerned with diversity. In recent years we have successfully attracted three Hispanic faculty (de la Iglesia, di Stilio, Wilson), made a committed attempt to hire an African American (Hayes), but have lost two other faculty from underrepresented groups (Edwards to Harvard, Naeem to Columbia). We continue to search aggressively for diverse faculty and do our best to keep them here (see below), but we are not the only ones so searching! The competition is fierce.

Our record with hiring women has been strong. This past year, however, all of our job offers were made to men. We think that this was an anomaly of small sample sizes. Nevertheless, the Faculty Appointments Committee this year has instituted several changes in an effort to ensure gender balance. For example, we specifically invited women (and men) with top postdoctoral fellowships and or with junior faculty positions elsewhere to apply. We see maintaining a balanced gender ratio as a key and achievable goal.

Faculty Mentoring. The Committee notes that we have no formal mentoring program. That is true, but it reflects current University policy. We of course recognize the vital importance of mentoring young faculty, of helping them establish solid research and teaching portfolios, and of obtaining extramural grant support. As the Committee notes, former Chair Tom Daniel and other senior faculty have done an excellent job of informally mentoring junior faculty. The new Chair will endeavor to maintain these high-priority activities.

The Committee Report stated that our Associate Professors are receiving inadequate mentorship. We disagree in general. We have provided some Associate Professors with substantial bridging funds in the hope that this will enable them to be competitive for new grants. In fact, in one case after the Committee visited, this goal was achieved: an Associate Professor who was supported by Departmental bridging funds for several years has recently received a major NSF grant. In addition, we have provided some Associate Professors with reduced teaching and committee loads, again giving them an opportunity to boost their careers. Finally, we continue to encourage senior faculty to review grant proposals of mid-career faculty. In any case, the Chair will check with Associate

Professors on this issue and implement corrections as appropriate.

The Report expressed concern that junior faculty might be burdened by heavy teaching demands. In fact, we work hard to minimize such burdens and thus believe that this concern is misplaced (at least relative to those of senior faculty). We assign reasonable teaching loads (and no committee work) to new faculty in their first year. Then we try to give junior faculty consistent teaching assignments so they don't have to develop new classes each year, though we are not always successful in this regard. Finally, the Junior Faculty Development Program (JFDP) from the College of Arts and Sciences provides each junior faculty with two special awards: each award provides *one quarter off from teaching* plus one month of summer salary (or the equivalent in research funds). Thus teaching demands on our junior faculty are actually much lower than those on our senior faculty.

As was documented in the Self-Study, faculty salaries are low (relative to some other science faculty in the College, and relative to biology faculty at our peer institutions). This inevitably depresses Departmental morale and continues to make us vulnerable to outside offers. [Salaries of our new hires appear competitive nationally: thus the acute problem of salaries is with compressed salaries of established faculty.] Fortunately, the College has recognized this; and Biology has recently received three unit adjustments: these have reduced – though not eliminated – some salary disparities. Unfortunately, no more unit adjustments will be coming.

We are optimistic that we have opportunities to make selective salary adjustments. Dean Cauce is establishing a pool of funds to provide pre-emptive salary boosts for meritorious individuals who are at risk of outside offers. We enthusiastically support this initiative and will aggressively apply for these raises for key Biology faculty.

Another way we ourselves can help compensate for low salaries is to actively seek early promotion for deserving junior faculty. Because promotions here now come with an automatic 7.5% raise, early promotion has a positive impact on current salary (and especially on retirement accumulations).

Since the Committee visited, we have developed another innovative way to help our junior faculty. We have established a special new endowment so that when faculty are promoted (Assistant to Associate or Associate to Full), they will receive a small grant to be used in any way they see fit, such as for a high-risk project or to support a graduate student. Initially the amounts will be modest (~

\$10K), but we will to build this endowment. The synchronous awarding of promotion and of a research grant should bring multiplicative (not just additive) benefits and also help retain faculty.

The Committee Report stated that a new building is critical to our research and teaching mission. We concur. Currently, our Biology faculty are fragmented among three buildings: such physical separation restricts promote department cohesion and collaboration. Moreover, two buildings (Kincaid, especially Hitchcock) are physically inadequate for contemporary biological research. Fortunately, a new Biology building is high on the UW's capitol building program. We will return to this issue later in this Response.

Finally the Committee encouraged us to move from a “best-candidate-available” hiring mode to a more targeted mode, in which we search for candidates in specific areas of opportunity and need. We disagree. Indeed, numerous studies sponsored by the ADVANCE program suggest that searching broadly is the single most effective mechanism for recruiting outstanding candidates who can build diversity at the institution. Moreover, because we have programmatic needs in all areas of biology and because selecting a narrow area for priority has the potential to create disharmony, we are convinced that our approach is the better way for the time being. We do have a long history of successes with this opportunistic approach. For example, a “flexible pursuit” strategy enabled Zoology to be come a world leader in mathematical biology in the 80s and 90s, and recently enabled Biology to become a leader in paleobiology. Accordingly, we choose to continue to search broadly for great new colleagues, not for colleagues in specific areas. Of course, if our approach results in serious under-representation of faculty in critical areas, we will target those.

3. Undergraduate majors (p. 5)

We agree with the Report's conclusions that our majors program is flourishing, and we also agree that it is bursting at the seams! So far we have chosen not to cap the major, but this may well become necessary if we are unable to hire new faculty and teaching staff at a sufficient rate.

Burgeoning enrollments have created barriers of access into our majors courses, and our new decision to reduce the chemistry prerequisite for Biology 180 (Introductory Biology – Ecology & Evolution) will certainly compound this problem at least for a few quarters (because many additional students will suddenly be eligible to take this course). But we are working hard to allow class sizes to increase, without compromising quality. Unfortunately, this past summer

we received only 8 of 19 requested TA positions. This inevitably means that some classes will have to be cancelled this spring.

Despite budget challenges, we will continue to provide special support to students with inadequate preparation; and so we will maintain Biology 179, which is an innovative support course conceived and run by our own graduate students.

We too recognize the confusion caused by having many listed classes that are rarely offered. Accordingly, we began removing such “listed-only” courses last year and have already removed 11. Only three rarely taught courses remain on the books: we are keeping these because we hope to teach them again.

We are concerned with the shortage of available classes in physiology and anatomy. Such courses are critical to a broad biology education and especially to those seeking careers in medicine, dentistry, and related fields. The recent loss of key physiology faculty (Wingfield, Ramenofsky, Riddiford, Truman) compounds this problem, and (as noted above) we are giving priority to hiring new faculty who can help meet the undergraduate and graduate needs in these areas.

4. Instructional program and teaching load (p. 5)

We agree with the Report’s assessment of our instructional program, but feel that our teaching loads are in fact heavy. We concur that the number of lectures per quarter is “not excessive by the standards of the broader UW community,” but feel our composite teaching load is excessive. Why?

First, as noted by the Report, our class sizes are relatively large. Only a decade or so ago, our 400-level courses typically had enrolments of up to 40 or 50 students: now they have swelled to more than 100 students. This huge increase occurred because Biology faculty were willing to let their classes double or triple in size in order to meet the needs of increasing numbers of undergraduates. But note that Biology faculty accepted much larger classes *despite* any significant increase in TA or grader help. Our faculty and TAs can’t continue to shoulder this burden without relief.

Second, it is not widely appreciated that *faculty in our introductory courses – by long tradition -- visit all of the lab sections (of which there are many) each week!* We make this extraordinary commitment because we recognize the vital importance of enabling students and faculty to interact personally: this is the only way that we can reduce “apparent” class sizes for many of our entering students. Of course, the associated costs to faculty are very

real yet do not appear in a traditional calculation of faculty time and effort.

Third, as noted by the Review Report, current support for TAs and graders is not commensurate with the number of undergraduates we teach, and this also adds to the considerable load on faculty (and on our TAs!). We will do our best to rectify this. Unfortunately, our recent request for help was only partially successful: we requested 19 supplementary TA slots, but only 8 were funded, even though we have expanded our course offerings. Unless we receive additional positions soon, we will be forced to cancel some classes this spring.

5. Graduate program (p. 6)

We are pleased that our graduate program is viewed as “among the best nationally.” We are of course delighted the quality of our students continues to be high. The international reputation of our graduate program results in a continued influx of great students, and certainly helps us recruit great faculty as well. But we can’t rest on our laurels and so are actively seeking ways to enhance our program. Here are some recent highlights of our efforts.

1) We are establishing a large new endowment that will provide *a one-quarter RA for all incoming students*. They can use this for rotations, for a course at a field station or laboratory, or some relevant activity of their choosing. This RA will be a great recruiting incentive, as well as provide a fantastic career boost for our students.

2) In recent years generous donations from staff and faculty have established endowments that provide a one-quarter RA specifically designated for students trying to *finish* their dissertations. We are giving priority to students who have served as TAs for much of their careers.

Despite these initiatives, we recognize two existing concerns. First, trying to attract top students in molecular and cell biology continues to be challenging, as the Review Committee notes. This is tough because we are competing with medical schools and specialty departments that have huge financial resources, many faculty, lower teaching loads, and higher pay. One way to compete effectively is to continue to add to our strength in plant molecular biology, as noted by the Report, but this isn’t a panacea. Second, also as noted by the Review Committee (p. 7), the continuing heavy demands of our undergraduate program greatly limit our ability to offer graduate lecture courses. This has long been a frustration: during the last review of Zoology (1993), this concern was highlighted both in our Self Study and in the Review Report. This needs to be rectified.

How can we ourselves increase the number of graduate courses? Increasing the number of faculty will help, but this is a long-term solution and works only if we can simultaneously control the relative growth of undergraduate demand. Another option is to run “super courses,” in which several ecology or evolutionary faculty lecture for one or two weeks. We have run several of these. However, these lectures are *voluntary* add-ons to our normal teaching load, and so are hard to sustain.

We hope to revamp our “Parade of Stars” seminar, which is now geared for undergraduates. In this seminar each faculty member gives a lecture/discussion on his or her area of expertise; during the quarter participating students are thus exposed to diverse topics. We hope to encourage new graduate students to take this course during their first quarter at the UW. This would introduce them to faculty who might sponsor them in rotations, and also make sure that they appreciate the breadth of research directions here.

We agree with the Report (p. 7) that maintaining equitable access will be a challenge as the Department grows; but we are confident we can do so. After all, we experienced a similar increase in size when Botany and Zoology merged.

6. Staff Issues (p. 8)

We completely agree that the Biology staff are superb – in fact, “superb” as an understatement. Our staff make everything work, and their competence and good will are central contributors to Departmental achievements and morale. We work hard to recognize their contributions, and each year we nominate one staff member for a University Distinguished Staff Award.

7. Strategic planning (p. 8)

We concur that the faculty are currently well-balanced, but recognize that some areas need better representation (e.g., evolutionary genetics and genomics, vertebrate structure and function, microbial sciences, the cellular and molecular basis of plant and animal function and form). We have already made substantial progress after the Committee convened. Takato Imaizumi, who has just joined the faculty, brings expertise in plant molecular genetics and physiology. In addition, Adam Leaché, who specializes in evolutionary genetics of vertebrates, will join our Department and also serve as Curator of Genetic Resources at the Burke Museum beginning in autumn 2010. We hope to add two curatorships (mammalogy, ornithology) in coming years, and these positions will likely bolster strength in evolutionary genetics and in organismal biology. We note that Joe

Felsenstein is a Professor in our department (and joint with Genome Sciences), and he is among the world's leading evolutionary geneticists. Finally, again after the Committee visited, we extended an offer to a vertebrate functional biologist with great outreach and teaching credentials. He has tentatively agreed to join our faculty in September 2009. Though resident at Friday Harbor, he will teach one-quarter per year on the main campus.

The Review report returns to the challenge of hiring in the areas of cell and molecular biology, and it urges us to continue our strategies in this regard (e.g., hiring in evo-devo and plant molecular and cell). As noted above, we intend to do so as appropriate and feasible. The new appointment of Takato Imaizumi is a strong step in the right direction.

Concern over the age structure of the department was raised again in the Report. We have discussed this previously (p. 5) but add that one new hire (Adam Summers will join us as an Associate Professor in 2009) and we are actively pursuing a senior candidate who is currently a full Professor at Cal Tech.

The Review returns to the theme of encouraging us to develop a strategic plan for hiring rather than continuing to advertise broadly and hire "the best people." Thus the Committee encouraged us to search more narrowly, to use "cluster hires" (which rapidly build strength in an area, and also may minimize start-up costs).

As discussed previously (p. 9), we appreciate the rationale presented by the Review Committee. Indeed, at a Departmental retreat last June, we extensively debated this specific issue. For reasons outlined previously in this report (p. 10), we have decided to search broadly again this year. Incidentally, searching broadly does not inhibit cluster hires – in fact, it actually increases the potential range of areas in which clusters could be achieved. Thus we would be delighted to hire clusters of neurobiologists, endocrinologists, cell biologists, or other specialists!

Nonetheless, we accept the challenge to be more flexible as to "search mode" and will support targeted searches as appropriate. [We did so this past year (Burke Curator of Genetic Resources, Associate Director of Friday Harbor)].

8. Space and a New Biology Building (p. 9)

The Provost and Dean have both strongly supported moves to establish a new building that will allow Biology to expand its research and instructional

missions. With initial planning funds provided by Vulcan and the UW, we are proceeding towards (a) a request to the State for capital project funds and (b) private funds that would complement state and federal funds. Although details of building design are beyond the scope of this present response, our rationale for a new building is as follows:

(1) Space limitations in laboratories and lecture halls make us unable to respond positively to the incredible pressure to increase enrollments in the biological sciences. The current demand exceeds our present ability to provide students adequate access to core and upper division courses even though we have increased the size of existing classes. Many majors outside the Biology are also hampered. Biology 180 (the beginning majors class, offered 4 quarters/year) was filled to saturation last autumn with 334 students and had a wait list that exceeded 200. This is just one of three (Biol 180, 200, 220) foundation courses that we offer. Not surprisingly, our majors find it difficult to gain entry into this series. In fact freshmen with a passion for the biological sciences are virtually unable to register for classes that would feed and encourage their interest in science. *This is simply unacceptable*, especially given that the National Science Foundation has mandated that more students be recruited into biology and our national infrastructure requires increased numbers be trained in this fast moving field. But space constraints are one key reason why we are unable to meet current (let alone future) enrollment demands.

(2) Because of poor design, the research labs in Hitchcock and Kincaid Halls are fixed and thus unable to expand or contract as research programs grow or contract. They are not even set up for modern biological sciences and have no flexibility in their design. A new building with appropriate research laboratory designs would permit rapid changes in configuration at low cost.

(3) Hitchcock Hall currently houses many laboratories that use temperature sensitive (and heat producing) equipment for modern molecular research. But because *HCH has no air conditioning*, we are forced to shut down some of these labs in the summer (PCR machines and sequencers won't work when the temperature in the labs exceeds 90°F).

(4) The Department of Biology faculty and students are housed in six locations across campus: Kincaid, Hitchcock, Johnson, the basement of the Physics Astronomy, the greenhouses, and the Burke. Such dispersal limits interactions between faculty and students, separates research from education, and leads to inefficient use of staff and resources.

(5) Our current instructional spaces are inefficient and out of date. New educational approaches and technologies will allow us to move many more students through our curriculum while maintaining laboratory sections of classes, which are the student-centered part of learning.

Concluding remarks

We again thank the Review Committee for their thoughtful evaluations and constructive suggestions, and also for their encouragement and support. As documented above in our Response, we are already implementing many of the Committee's recommendations. With continued help from College, we will work hard to achieve our high goals in research, teaching, and service to the University and the State.