



June 21, 2017

Ruth V. Watkins
Senior Vice President for Academic Affairs
205 Park Bldg.
Campus

RE: Graduate Council Review
Department of Biology

Dear Vice President Watkins:

Enclosed is the Graduate Council's review of the Department of Biology. Included in this review packet are the report prepared by the Graduate Council, the Department Profile, and the Memorandum of Understanding resulting from the review wrap-up meeting.

After your approval, please forward this packet to President David Pershing for his review. It will then be sent to the Academic Senate to be placed on the information calendar for the next Senate meeting.

Sincerely,

David B. Kieda
Dean, The Graduate School

Encl.

XC: M. Denise Dearing, Chair, Department of Biology
Henry S. White, Dean, College of Science

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The Graduate School - The University of Utah

**GRADUATE COUNCIL REPORT TO THE SENIOR VICE PRESIDENT
FOR ACADEMIC AFFAIRS AND THE ACADEMIC SENATE**

January 30, 2017

The Graduate Council has completed its review of the **Department of Biology**. The External Review Committee included:

Vytas A. Bankaitis, PhD
E.L. Wehner-Welch Foundation Chair in Chemistry
Department of Molecular and Cellular Medicine
Texas A&M University

Scott Edwards, PhD
Professor of Organismic and Evolutionary Biology
Harvard University

Kimberly A. Hughes, PhD
Professor and President, Society for the Study of Evolution
Florida State University

Carlos Martinez del Rio, PhD
Professor, Department of Zoology and Physiology
University of Wyoming

The Internal Review Committee of the University of Utah included:

Marjorie Chan, PhD
Professor
Department of Geology and Geophysics

David Grunwald, PhD
Professor
Department of Human Genetics

Jody Rosenblatt, PhD
Associate Professor
Department of Oncological Sciences

This report of the Graduate Council is based on the self-study (SS) submitted by the Department of Biology, the reports of the external review (ER) and internal review (IR) committees, and the Department Chair's and College Dean's responses to the external and internal committee reports.

DEPARTMENT PROFILE

Program Overview

The mission of the Department of Biology is to provide training for undergraduate majors, graduate students and postdoctoral researchers. This training enables a workforce in biotechnology, health care, academia and related fields. The Department of Biology advances the field through scholarly activities consisting of rigorous scientific methods and high-quality research. Service to the university is provided through introductory biology courses for non-majors. This mission results in the advancement and awareness of all aspects of biological sciences. The Department of Biology has two main sections: Molecular, Cellular, and Evolutionary Biology (MCEB) and Ecology, Evolution, and Organismal Biology (EEOB). The department is vibrant and strong but faces some issues in the near future.

The Department of Biology is in the College of Science. The administration of the Department of Biology consists of a Chair, Dr. Denise Dearing; Associate Chair, Dr. Jack Longino; and 4 elected tenure-line faculty representatives with 2 each from MCEB and EEOB. This leadership structure has evolved from the last review, resulting in better morale among the tenure-line faculty. Faculty report more transparency than before. With the size of the faculty and the expectation of the Chair being research active, the structure of administration may need to change further to allow the Chair and members of the administrative team to be productive in research as well as administration.

The Department of Biology has responded to most of the recommendations from the last (2009) program review except for two: 1) there is not a strategic plan, and 2) there is little tracking of student progress, outcomes and placement. The department has held strategic planning meetings but has not produced a strategic plan. Currently, cohorts of faculty are proposing areas for future growth, but a coherent strategic plan would benefit future growth, diversity, and stability of the department.

The external report describes a "sense of tension and competition between the Department of Biology and the Health Sciences Center" and recommends working with HSC and the university administration to forge a more synergistic relationship. However, neither the internal review nor the external review note or comment on this statement included in the self-study document indicating that other undergraduate degrees are being considered:

"The Department of Biology is currently responsible for all undergraduate education in the biological sciences at the University of Utah, although this may change in the future as other departments, particularly those on the Health Science Campus propose undergraduate degrees in Biology."

Having competing biology degree programs at the University of Utah would have significant impact on the Department of Biology.

As stated in the commendations from the external review [ER]:

“The Biology Department is a collegial, democratically run unit that is, in many ways, meeting and exceeding its educational and research mission across an exceptionally broad range of the life sciences.”

Faculty

The department reports 52 tenure-track faculty, including 3 faculty with Biology as a secondary appointment. There are 52 career-line or adjunct faculty comprising 8 career-line lecturing faculty, 29 career-line research faculty, and 15 adjunct faculty. The tenure-line faculty is comprised of 25% females, but other diversity is lacking with no underrepresented groups. The diversity is lower than peer institutions. Career-line faculty is 54% female and also has no underrepresented groups.

Retirement of a number of senior faculty members is anticipated. The challenges from this will require strategic planning including growth areas and impact to the research funding.

The research productivity of the Department of Biology is high when compared with other departments using Academic Analytics. The external review notes that retiring senior faculty will have a negative impact on indirect funds generated. This will subsequently have a negative impact on the department's budget. The Dean's response notes that funding has decreased on average since the last review while the number of tenure-line faculty has increased. Research funding is not the only metric for departmental success but it is important, as the returned overhead provides for startup packages and resource allocation within the department.

The Dean's letter addresses the teaching load of the tenure-line faculty. There are two issues noted: the Department of Biology has much lower SCH per tenure-line faculty than other departments in the college, and the uniformity of teaching loads appears to be independent of research productivity. The Dean notes a concern that faculty without, or with very limited, research funding have the same teaching load as those with very successful research labs. The Dean's letter also addresses faculty compensation. Although there is severe salary compression in the Department of Biology, this does not appear to be the case across other departments within the college. The department may wish to review the teaching assignment policy with respect to research funding for tenure-line faculty as well as the impact on the allocation of resources within the department's budget including TA budget, faculty compensation, as well as other departmental needs.

The morale among the tenure-line faculty is high, and the ER, IR and Chair's response all indicate that this has improved considerably since the last review. They are supportive of the department's administration team but are concerned about space issues. The career-line faculty believe they have not been given the opportunity to be involved with curriculum. The Chair's response indicates this is changing and they will be given a voice in the undergraduate curriculum changes. Additionally, there was dissatisfaction among the career-line faculty about the lack of formal evaluation, continuity, and teaching assignments.

Students

At the time the self-study document was prepared, the Department of Biology had 993 undergraduate majors including both pre and full majors. As reported in the external review, there are similar Hispanic/Latino percentages as the University of Utah student population as a whole (11%), while female undergraduate students make up 51.8% of the undergraduate majors, which is above the University population.

The undergraduate students interviewed expressed satisfaction with the advising and the undergraduate program, faculty accessibility, and research opportunities. An exception was made for the Honors Program, where the additional Honors requirements impacted biology majors in addition to the absence of biology courses in the first year. The undergraduate students expressed a desire for a clear pathway for research involvement. The department is eliminating the costly BioURP program and exploring ways to restructure the program in the future. The department is exploring other mechanisms for involving undergraduate students in research.

The department reports 76 graduate students and 31 postdoctoral fellows. The graduate admission rate is low (8-11%), which leads to high quality PhD students in the program. The diversity of the graduate population includes 38% women and 5.8% underrepresented groups.

The graduate students note a community spirit, high morale and satisfaction with the department and the graduate student experience. Improvements since the last review include additional courses, more involvement in research progress talks by students, and an average time to graduation for PhD students of 5.5 years. The graduate students demonstrated confusion about a department policy of a 5-year limit on funding. This was noted in the Chair's response to the reviews and will be clarified in the future.

As reported in the external review [ER]:

"Graduate and undergraduate degree programs are delivering high quality educational experiences, as reported by the students themselves. Both graduate and undergraduate students are passionate and enthusiastic about the education that they receive."

Curriculum

The Department of Biology recognizes the need for re-evaluating the undergraduate curriculum and requirements. To address this, a curriculum committee has been formed and the department is in the process of nominating a curriculum director. As noted in the self-study, the requirements are such that many pre-med students choose a different major. The external review urges rapid adoption of changes to the undergraduate curriculum.

Additionally, the self-study notes that Health Sciences is considering a biology major. As described in the Program Overview, having competing biology degree programs at the University of Utah would have significant impact on the Department of Biology.

Due to changes since the last review, the graduate curriculum now provides “improved cohesiveness, broadened training, and increased student morale” [ER]. Graduate students were enthusiastic about the department and felt engaged in a cohesive community.

Program Effectiveness and Outcomes Assessment

The graduate program has an annual development plan for assessing student progress and also tracks student recruitment, graduation rates, demographics, and placement after graduation. At the undergraduate level, a strong advising staff guides students in meeting graduation requirements. However, there is not a standard mechanism for assessing and tracking student recruitment, graduation rates, demographics or placement after graduation.

The Department of Biology should put in place metrics for program effectiveness and outcome assessments at both the graduate and undergraduate levels. This was recommended in the last review but has only been implemented for graduate students.

Facilities and Resources

The Department of Biology is spread over 4 buildings. One of these, the Life Sciences Building, has been deemed unsafe and as a result, laboratory space is negatively impacted. The University of Utah should provide adequate and safe laboratory space to ensure a vibrant and successful department. Power issues plague the South Biology building. The loss of primary power does occur from time to time. However, the failure of backup power is unacceptable and the negative impact on research labs can be devastating. The University of Utah should immediately resolve the power issues in the South Biology building.

The staff support is strong in the department and the staff reports a high degree of job satisfaction. Knowledgeable and effective staff meet, or exceed, faculty and students’ needs across administrative, technical, facilities, and advising.

COMMENDATIONS

1. The Department of Biology currently benefits from strong leadership and from increased faculty participation in governance. There was unanimous, strong support for the Chair of the Department, Prof. Denise Dearing, and the Associate Chair, Prof. Jack Longino.
2. Since the last review, the Department of Biology has reinvigorated the graduate program through reorganization, offering more classes, and involvement of the students and faculty in the program, resulting in good completion rates.
3. Graduate and undergraduate degree programs are delivering high quality educational experiences, as reported by the students themselves. Both graduate and undergraduate students are passionate and enthusiastic about the education that they receive.
4. Administrative, advising, technical, and facilities staff are knowledgeable and efficient, and interact well with faculty and students in the Department of Biology.

5. The Department of Biology has established a curriculum committee and is in the process of nominating a curriculum director.

RECOMMENDATIONS

1. The University should provide modern laboratory space to the Department of Biology. The power issues in the South Biology building should be immediately resolved and long-term viability of remodeled Life Science Building lab space should be a priority.
2. The department should increase diversity in the tenure-line faculty ranks. Currently, the diversity is lower than peer institutions for both underrepresented groups and women.
3. There is a pressing need for a strategic plan. This will impact the coordination of the role of Biology as it relates to the mission of the Health Sciences Center, hiring new and diverse faculty to replace upcoming retirements, improving diversity in the faculty ranks, attracting a more diverse cohort of graduate students, and identifying/achieving long-term goals and objectives.
4. The department should establish clear mechanisms to evaluate career-line faculty, provide predictability in their teaching schedules, and establish mechanisms for their participation in the department's academic life.
5. The Department of Biology should creatively restructure the Biology Major. Such a restructuring would keep the undergraduate program competitive and contemporary, and address issues that relate to student research, the frequency of laboratory course offerings, and the Honors program.
6. The Department of Biology should develop a plan to track and analyze student progress, outcomes and placement in both the undergraduate and graduate programs.

Submitted by the Ad Hoc Committee of the Graduate Council:

Charles D. Hansen (Chair)
Professor, School of Computing

Kristin G. Cloyes
Associate Professor, College of Nursing

Jeffrey R. Moore
Assistant Professor, Department of Geology and Geophysics

Seetha V. Veeraghanta (Undergraduate Council Representative)
Associate Professor (Lecturer), Undergraduate Studies

Seven-year Department Review for Biology

		Faculty Headcount						
		2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
With Doctoral Degrees Including MFA and Other Terminal Degrees	Full Time Tenured Faculty	34	33	36	36	34	32	34
	Full Time Tenure Track	6	8	7	7	8	9	11
	Full Time Career Line/Adjunct Faculty	22	22	23	24	20	21	18
	Part Time Tenure/Tenure Track	3	4	4	4	6	4	3
	Part Time Career Line/Adjunct Faculty		1	4	3	4	6	5
Total		65	68	74	74	72	72	71
With Masters Degrees	Full Time Tenured Faculty	0	0	0	0	0	0	
	Full Time Tenure Track	0	0	0	0	0	0	
	Full Time Career Line/Adjunct Faculty	2	2	2	2	2	2	2
	Part Time Tenure/Tenure Track	0	0	0	0	0	0	
	Part Time Career Line/Adjunct Faculty		0	0	0	0	0	
Total		2	2	2	2	2	2	2
With Bachelor Degrees	Full Time Tenured Faculty	0	0	0	0	0	0	
	Full Time Tenure Track	0	0	0	0	0	0	
	Full Time Career Line/Adjunct Faculty	0	0	0	0	0	0	
	Part Time Tenure/Tenure Track	0	0	0	0	0	0	
	Part Time Career Line/Adjunct Faculty		0	0	0	0	0	
Total		0	0	0	0	0	0	0
Total Headcount Faculty	Full Time Tenured Faculty	34	33	36	36	34	32	34
	Full Time Tenure Track	6	8	7	7	8	9	11
	Full Time Career Line/Adjunct Faculty	24	24	25	26	22	23	20
	Part Time Tenure/Tenure Track	3	4	4	4	6	4	3
	Part Time Career Line/Adjunct Faculty		1	4	3	4	6	5
Total		67	70	76	76	74	74	73

Cost Study							
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Direct Instructional Expenditures	7,800,079	7,788,951	9,035,888	9,174,213	9,530,975	10,002,070	10,263,655
Cost Per Student FTE	9,145	8,776	9,837	9,370	9,895	9,992	10,379

FTE from Cost Study							
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Full-Time Salaried	53	44	49	51	52	52	68
Part-Time or Auxiliary Faculty	2	3	3	3	4	5	17
Teaching Assistants	1		1				

Funding							
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Total Grants	11,854,583	11,322,209	10,692,518	10,188,515	9,788,680	9,724,127	12,674,017
State Appropriated Funds	7,336,608	7,171,919	7,654,776	7,889,766	8,112,848	8,579,251	10,177,219
Teaching Grants	502,357	759,438	582,753	658,638	676,483	546,620	411,612
Special Legislative Appropriation*							
Differential Tuition*							

		Student Credit Hours and FTE						
		2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
SCH	Lower Division	18,326	18,937	19,837	20,719	20,080	20,274	20,295
	Upper Division	5,161	5,631	5,674	6,188	6,303	6,953	6,994
	Basic Graduate	170	157	124	179	172	181	217
	Advanced Graduate	1,231	1,215	1,240	1,466	1,505	1,688	1,368
FTE	Lower Division	611	631	661	691	669	676	677
	Upper Division	172	188	189	206	210	232	233
	Basic Graduate	8	8	6	9	9	9	11
	Advanced Graduate	62	61	62	73	75	84	68
FTE/FTE	LD FTE per Total Faculty FTE	11	13	13	13	12	12	8
	UD FTE per Total Faculty FTE	3	4	4	4	4	4	3
	BG FTE per Total Faculty FTE	0	0	0	0	0	0	0
	AG FTE per Total Faculty FTE	1	1	1	1	1	1	1

Enrolled Majors							
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Undergraduate Pre-Majors	257	279	321	306	253	218	263
Undergraduate Majors	562	604	642	688	784	775	800
Enrolled in Masters Program	6	4	7	11	3	4	3
Enrolled in Doctoral Program	63	62	71	78	78	82	73
Enrolled in First Professional Program							

Degrees Awarded							
	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
Undergraduate Certificate							
Graduate Certificate							
Bachelors	131	123	174	169	181	175	188
Masters	5	4	1	15	1	4	6
Doctorate	8	6	10	8	9	10	8
First-Professional							



Memorandum of Understanding Department of Biology Graduate Council Review 2016-17

This memorandum of understanding is a summary of decisions reached at a wrap-up meeting on May 10, 2017, and concludes the Graduate Council Review of the Department of Biology. Ruth V. Watkins, Senior Vice President for Academic Affairs; Henry S. White, Dean of the College of Science; M. Denise Dearing, Chair of the Department of Biology; David B. Kieda, Dean of the Graduate School; and Katharine S. Ullman, Associate Dean of the Graduate School, were present.

The discussion centered on but was not limited to the recommendations contained in the review summary report presented to the Graduate Council on January 30, 2017. The working group agreed to endorse the following actions:

Recommendation 1: The University should provide modern laboratory space to the Department of Biology. The power issues in the South Biology building should be immediately resolved and long-term viability of remodeled Life Science Building lab space should be a priority.

The most pressing problems with current laboratory space are being resolved: an emergency generator for South Biology is being installed and a plan for remodeling the Life Science Building is set. This plan, however, involves conversion of the Life Science Building into office and classroom space, not laboratory space. Some Biology labs will be housed in the new Crocker Science Center, a facility shared by several units. Through much effort on the part of the Chair, an orchestrated plan for all the necessary moves and rearrangements has been made. This master plan accounts for the lab space, although somewhat tighter, of current faculty, but does not leave any extra room for growth. SVP Watkins noted that a conversation has started around longer-term space planning for the College of Science more generally. Access to sufficient modern laboratory space will clearly remain imperative as the Department evolves during the upcoming years. Updates to the Graduate School should include assessment of how these needs are being met.

Recommendation 2: The department should increase diversity in the tenure-line faculty ranks. Currently, the diversity is lower than peer institutions for both underrepresented groups and women.

Several strategies to achieve this recommendation were discussed. Inviting more candidates to visit gives the opportunity to be more inclusive at the outset of the search. Using the faculty's peer network to get referrals of individuals from underrepresented groups may provide a chance to proactively recruit URM

candidates. Success in this area may also require being less risk averse -- e.g., identifying candidates who have notable potential and recruiting them early in their job search window. One way to assess such an early candidate would be to host a symposium (as has been done in Biochemistry), with invitations extended to specific postdoctoral fellows of interest. Alternatively, hiring at the mid-career level may be of benefit to the department and simultaneously provide an opportunity to hire an established URM scientist. Whatever strategies the department implements, there may be University resources for hiring diverse faculty that can be leveraged. Ultimately, one reason to have a diverse, gender-balanced faculty is so that similarly diverse students have role models who reinforce their potential for success. Ensuring that the department's seminar series reflects diversity is a more immediate step that can be taken toward this end.

Recommendation 3: There is a pressing need for a strategic plan. This will impact the coordination of the role of Biology as it relates to the mission of the Health Sciences Center, hiring new and diverse faculty to replace upcoming retirements, improving diversity in the faculty ranks, attracting a more diverse cohort of graduate students, and identifying/achieving long-term goals and objectives.

Changing departmental structure is a key first step in creating a strategic roadmap for the department. Faculty recently approved the plan to be organized in three disciplinary areas, and a formal proposal to become a School comprised of these three sections is moving forward. This reorganization will help distribute leadership responsibilities and create hubs for planning. For instance, disciplinary groups can plan cluster hire proposals aimed at generating critical mass within these areas. Hiring plans can also focus creatively on areas that create bridges between sections, as well as bridges to the broader campus. Some of these steps are already happening and Dr. Dearing was commended for this exciting progress. Many additional issues remain in terms of strategic planning. Three topics related to strategic planning were touched on at the wrap-up meeting: 1) Dean White strongly advocated that TA-ships be reserved for students of non-tenured faculty, with the expectation that grant funding of tenured faculty can cover their students' stipends. Eliminating the practice of spending TA funds to support students in the laboratories of tenured faculty will allow the department to significantly increase the size of its graduate research program, as well as provide additional resources to junior faculty. While disciplinary differences may influence expectations among faculty, this is an important topic to evaluate as a group. 2) With the Biology Department educating many students who go on to enter training programs in health sciences, strengthening ties to the Health campus is vital. Specifically, getting input on educational needs and finding efficient and collaborative means of instruction is an important goal. This is particularly the case with courses such as Human Anatomy. 3) In order to remain a competitive department, research funding

must be robust. In the process of strategic planning, faculty should reflect on how best to reinforce a culture where there is an expectation of funded research programs that is appropriately incentivized and supported. There are many facets -- beyond what there was time to discuss -- to a thorough strategic plan, and the documentation of the Graduate Council review (including external and internal review reports, as well as the self-study) will provide a source of ideas to build on as the department moves further on this process. The Graduate School looks forward to future updates on this plan and how it helps the department prioritize and promote initiatives.

Recommendation 4: The department should establish clear mechanisms to evaluate career-line faculty, provide predictability in their teaching schedules, and establish mechanisms for their participation in the department's academic life.

This recommendation has largely been addressed. A policy for career-line faculty review with streamlined language was approved in January 2017. Moreover, most long-term career-line faculty are now on multi-year contracts, with formal review taking place every 3-5 years. Future updates to the Graduate School should include evaluation of whether these extended contracts accomplish the predictability in teaching schedules that was desired. Additional steps taken toward integrating career-line faculty into the department's academic life should be reported as well.

Recommendation 5: The Department of Biology should creatively restructure the Biology Major. Such a restructuring would keep the undergraduate program competitive and contemporary, and address issues that relate to student research, the frequency of laboratory course offerings, and the Honors program.

The department is on track to launch a newly-revised major in Fall semester 2018. Dr. Dearing described first-year courses that will be held in the Crocker Science Center, which sound like a wonderful opportunity to engage students and expose them to a biology laboratory. We look forward to the update on how this plan impacts the department's ability to attract and retain majors. Issues brought up about the Biology Honors program are being carefully considered in close collaboration with Dr. Sylvia Torti, Dean of the Honors College, and advisors from both the Biology Department and the Honors College. Feedback from student focus groups will be used to develop both short- and long-term goals to address student concerns. Following approval by the Honors Committee and, if needed, the Curriculum Committee, the department will begin implementing these changes. Addressing how best to sustainably support student research experiences should be tackled in the context of strategic planning. We hope to learn about new steps taken to improve the Honors Program and to support student research in the first MOU update.

Recommendation 6: The Department of Biology should develop a plan to track and analyze student progress, outcomes and placement in both the undergraduate and graduate programs.

With the challenge of having a very large cadre of undergraduate students, the department will need to prioritize what to track as they roll out a plan to address this recommendation. SVP Watkins suggested that the top priority is to track the progress of students currently in the program, in order to promote progression and retention. There is now a technology tool for advisors (Civitas Learning) that should be very helpful. Additionally, a new data analyst in the College of Science may be able to assist in identifying factors that predict issues with student progress. A second major step would be to track outcomes and placements for undergraduates. This would involve tracking and maintaining a database for ~200 graduates a year and would require funding for personnel or a more centralized infrastructure (perhaps at the College level) to implement. At the graduate level, the department already is tracking outcomes for graduate students during the first few years of post-graduation. This likely misses significant placement data as many graduates do a postdoctoral fellowship before their more permanent placement. Longer-term data collection is necessary to understand outcomes, but resources to undertake this are a limiting factor. Implementation of thorough undergraduate and graduate tracking may require further discussion.

This memorandum of understanding is to be followed by regular letters of progress, upon request of the Graduate School, from the Chair of the Department of Biology. Letters will be submitted until all of the actions described in the preceding paragraphs have been completed. In addition, a three-year follow-up meeting may be scheduled during AY 2019-20 to discuss progress made in addressing the review recommendations.

Ruth V. Watkins
Henry S. White
M. Denise Dearing
David B. Kieda
Katharine S. Ullman



David B. Kieda
Dean, The Graduate School
June 21, 2017