September 14, 2005

A. Lorris Betz
Senior Vice President for Health Sciences
Dean, School of Medicine
5th Floor, Moran Building

RE: Graduate Council Review
Department of Pharmaceutics and Pharmaceutical Chemistry

Dear Vice President Betz:

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

Please forward this review to the Academic Senate to be placed on the information calendar for the next meeting of the Senate.

Sincerely,

David S. Chapman
Associate Vice President for
Graduate Studies
Dean, The Graduate School

Encl.

DSC/dh

cc: John W. Mauger, Dean, College of Pharmacy
Steven E. Kern, Interim Chair, Dept. of Pharmaceutics and Pharmaceutical Chemistry

The Graduate School – University of Utah

GRADUATE COUNCIL REPORT TO THE SENIOR VICE PRESIDENT FOR HEALTH SCIENCES AND THE ACADEMIC SENATE

April 25, 2005

The Graduate Council has completed its review of the Department of Pharmaceutics and Pharmaceutical Chemistry. The external reviewers were:

Jessie L.-S. Au, Pharm.D, Ph.D. (Chair)
Distinguished University Professor
Colleges of Pharmacy, Medicine and Engineering
The Ohio State University

Kinam Park, Ph.D.
Professor
College of Pharmacy
Purdue University

David A. Tirrell, Ph.D.
Professor and Chair
Division of Chemistry and Chemical Engineering
California Institute of Technology

The Internal Review Committee of the University of Utah included:

Charles Grissom, Ph.D.
Professor
Department of Chemistry

Martin Rechsteiner, Ph.D.
Professor

Department of Biochemistry

Randall Stewart, Ph.D.
Associate Professor
Department of Languages and Literature

This report by the Graduate Council's ad hoc review committee is based on the Department of Pharmaceutics and Pharmaceutical Chemistry self study (December 2004), the report of the three external reviewers and exit interview with them (December 2004), the report of the internal reviewers (December 2004), and the co-response of the Chair of the Department and Dean of the College of Pharmacy (February 2005).

DEPARTMENT PROFILE

Overview

The Department of Pharmaceutics and Pharmaceutical Chemistry is one of four departments in the College of Pharmacy at the University of Utah. The Department offers degree programs leading to the Master of Science (M.S.), Master of Philosophy (M.Phil.), and Doctor of Philosophy (Ph.D.), all in Pharmaceutics. The Department does not offer an undergraduate degree, but it contributes to the teaching of three courses in the Professional Doctorate of Pharmacy (Pharm.D.) curriculum; pharmaceutics is a major component of the professional pharmacy curriculum. The departmental missions are to advance research in the areas of pharmaceutical chemistry and drug delivery, and to provide excellent educational opportunities for all students that they teach.

The Department has attained international recognition and an outstanding reputation in pharmaceutical research, being at the forefront of research on drug delivery and biomaterials. The Department also maintains a graduate program that is ranked within the top tier of the Pharmaceutics graduate programs in the United States. The Department has evolved over time, generally reflecting the changes within the discipline on national and international levels. Currently the Department's focus is on integrating molecular medicine and computational biology to advance the knowledge base in the delivery of small and large molecules. The evolution of the graduate program and research foci, provide the foundation for maintaining the momentum and the scientific leadership in the drug delivery area.

According to Dr. Au, who was an external reviewer for this and the prior review of 1998, the Department seems to be in better shape than 7 years ago. She defines this as an outstanding Department poised to continue growing their strengths and one that has been responsive to concerns raised in the last review. In general, external reviewers state that the scale of the program is considered sufficient and provides the necessary critical mass for achieving academic excellence.

Professor Jindrich Kopecek led the Department from July 1999 to July 2004. Beginning July 1, 2004, the Department has been headed by an interim chair, Steven Kern, who joined the department four years ago and is currently an Assistant Professor.

While Professor Kern has done a commendable job as interim chair, the need for a permanent chair is universally seen as the number one priority for the Department. It is highly unusual for a non-tenured, assistant professor, still developing as a researcher, to be chair. Without more appropriate leadership, the Department risks eroding faculty morale, maintaining the status quo and/or growing, losing faculty and/or facing difficulty in hiring new faculty, and losing funding opportunities. The Department has recently attained an Endowed Chair from the George S. and Dolores Dore Eccles Foundation that will assist in the recruitment of a world-class scholar to head the Department, someone who can bring a new perspective and new critical mass to the faculty core.

Faculty

There are a total of 13 regular faculty members including 4 distinguished professors, 2 professors, (one is the Dean of the college), 2 associate professors and 5 assistant professors. There are also 5 research faculty members and 24 adjunct faculty members. Of the 13 regular faculty members, two are females and six are of Asian ethnicity, which is reflective of the general population at peer schools in terms of gender and minority representation.

The senior faculty is internationally renowned. The junior faculty members have excellent training and expertise, and some have already shown great promise as outstanding researchers and scholars. Most of the faculty members are currently engaged in two core areas of research: Macromolecular therapeutics, and Biomolecular and Cellular Pharmaceutics. These areas of expertise reflect recent growth within the Department and expansion into drug delivery efforts that interweave pharmaceutical chemistry with biology and physiology. The Department anticipates that future Department growth and maturation in these areas will result in a single research emphasis that will primarily reflect biologically-based drug delivery.

The level of scholarly activity (especially the activity of the senior faculty), including number of publications and external research funding, is impressive and high compared to peer schools. The level of research support has been increasing over the last several years as more junior faculty begin to obtain significant continuous funding for their research. Several senior faculty members have launched start-up biotech companies, which have led to the creation of about 500 new high tech jobs in the State of Utah. Furthermore, the Department has been organizing the International Symposium on Recent Advances in Drug Delivery Systems (commonly known as the Utah meeting) for the last 24 years.

Faculty morale is generally high, and collegiality is apparent. The expectations for teaching, research and service seem well defined and balanced. A formal faculty mentoring program for junior faculty members is in place. Several junior faculty members have indicated that the mentoring program has been very helpful. The Department fully realizes that it is incumbent on senior faculty to continue to support and mentor junior faculty so that their transition to full research productiveness and

attainment of tenure is achieved before the phased retirement of the senior faculty members.

The collective presence of several distinguished pharmaceutical scientists in the Department has been the key to its success. The upcoming retirement of these senior faculty members and the relatively large number of untenured junior faculty members have created a uniquely urgent need of a new chair to provide the scientific and administrative leadership to maintain and promote the standing of the Department in the University and in the pharmaceutical science community.

The policy on Retention, Promotion and Tenure, although in place, is not well communicated to many of the junior faculty members according to the external reviewers. There is a concern that the department does not have the opportunity to present or represent its candidates to the college RPT committee. A second concern is that Department and college expectations are not always aligned, resulting in ambiguity and confusion to some of the untenured faculty members.

The average salaries for professors at all ranks are low relative to their peers of comparable levels of accomplishments and productivity. This represents a potential problem for attracting and retaining outstanding senior and junior faculty.

Curriculum

The Department only grants graduate degrees, accepting students only into the doctoral degree program. Students on average take from 5 to 6 years to graduate. The Department does offer a terminal Master of Science degree for students who are unable to complete their doctoral program but have completed the Department core classes, passed at least the written comprehensive exam, and completed enough research to represent one published manuscript.

Tenure track faculty members are responsible for teaching in both the Professional Pharm.D. degree program (3 classes) and the Department graduate core curriculum (5 classes). The professional student classes are taught primarily by junior and middle level faculty members. The Department also participates in the interdepartmental graduate programs in Biological Chemistry and Molecular Biology.

The excellent leadership by the past chair has brought consensus in the core curriculum, solving one of the major concerns pointed out in the previous review. The Department has done an impressive job in improving the quality of the program. The graduate core curriculum has been redesigned to reflect the new research direction and strength of the Department faculty, and the field at large. The curriculum seems to be keeping pace with an ever-changing field. The Department offers diverse courses covering all aspects of drug delivery and biomaterials, and relevant related topics. Students have excellent opportunities to learn the state-of-the-art information taught by leaders in the field.

Currently there are 7 required core courses taken by all graduate students. It has been suggested to adjust the total number of these core courses, so the selection of the

courses is more tailor-made based on individual students whose backgrounds and research interests may be widely different.

Students

There are currently 34 graduate students. The pool of students seems to be quite strong. Intellectually talented and creative, students enter the program from diverse undergraduate education backgrounds. GRE scores are generally in the 75^{th} to 99^{th} percentile. The Department relies on several parallel approaches for attracting highly talented students. Of these, the summer internship program seems to work very well for recruiting graduate students, and it is highly recommended to continue the program with possible expansion. The current pool of graduate students represents many nationalities of both genders; about half are foreign, mainly from China and India.

The number of graduate students has increased, and the students appear quite satisfied with the general quality of education they are receiving. They are also pleased with their research opportunities, course work, and job prospects. Strong employment placement and prospects for graduating students reflect the high quality of their education. Graduates have established themselves as highly regarded scientists, assuming positions in academic institutions, and scientific and managerial positions in local, national, and international pharmaceutical companies.

Current student support is entirely from research grants either as Graduate Fellows or Graduate Research Assistants; there are no formal teaching assistant (TA) positions. The lack of TA positions raised a concern for the external reviewers. The TA positions are needed not only for teaching undergraduate students, but also as a mechanism of supporting new graduate students during their first and/or second year of the graduate program. All graduate students, though, are expected to teach in at least one department course (either graduate or professional pharmacy) during their studies, which is asking research assistants to take on TA duties. Students who serve in teaching assignments more than once are provided with a stipend supplement to their research assistantship stipend. There seems to be little in-house training and/or mentoring for students in their teaching responsibilities.

Facilities and Resources

Office and laboratory space for the faculty is spread between three buildings: i.e., Skaggs Building, Biopolymer Building, and Research Park. The laboratory space is adequate, though maintenance and infrastructure issues with the Research Park facility were cited. However, the division of the department space in three buildings represents an obstacle for faculty and student interaction and cohesiveness, and may become a limiting factor for the department. The three separate facilities make sharing of equipment difficult. Communication between the distant facilities is limited, especially

when the Internet is down and e-mail is unavailable. Students, faculty and staff encounter problems daily because they cannot easily interact with each other by face-to-face contact. The three separate building sites may also limit the Department from achieving greater heights and, from a more practical standpoint, to take advantage of the unprecedented opportunities and programmatic initiatives offered by the National Institutes of Health in translational research and therapy development, the two areas where the department has significant strengths.

Budgetary constraints have affected the operation of all areas of the Department. The operating budget does not adequately support program needs. Faculty members have absorbed numerous costs that the department had traditionally paid, including office supplies.

The existing secretarial support for the department is five full-time and two 3/4-time staff. The internal reviewers considered this as inadequate for a staff that deals with and supports the Chair, faculty, graduate students, and numerous research people.

Each physical location has a very small library of journals and discipline-specific scientific books, or none at all. The Eccles Health Sciences Library has limited numbers of what is required. There is a great reliance upon on-line journals, which provide up-to-date articles when subscriptions are available, but these resources are very inadequate according to the internal reviewers.

COMMENDATIONS

1. The Department is recognized internationally for its excellence in research, and ranks among the best programs in pharmaceutics, with outstanding accomplishments in drug delivery. While this recognition is largely built upon the reputation and funded research of the senior faculty, the junior faculty members are beginning to establish themselves and their research portfolios. Recent hires, since the last review, are endowed with state-of-the-art research expertise and are poised to make excellent contributions to promote academic excellence in the Department.

2. The Department has been responsive to the last review and, to the extent afforded by the available resources, has implemented the recommendations put forth by the external and internal reviewers.

3. The senior faculty members should be commended for their efforts and successes in mentoring the junior members of the Department.

4. The immediate past chair provided critical and able leadership and chaperoned the Department through a renewal process that enabled the integration of biology and molecular medicine into the research and teaching programs, which in turn has provided an excellent foundation for the program to continue to excel as one of the top graduate programs in the country. The current interim chair, who assumed the

position July 1 2004, is also to be commended for his commitment and skillful management to stay on course in maintaining academic excellence.

5. The Department has recently secured an endowed chair to facilitate the hiring of a new chairperson of significant stature. This is the first endowed chair in the College of Pharmacy, and speaks to the strong support of the Dean for the Department.

6. The graduate program has been steadily growing since the last review. The ability of providing quality training to graduate students, leading to pharmaceutics-related jobs for nearly all of its graduates, continues to be a major strength of the Department.

7. Morale in the Department is quite high, especially among the junior faculty and graduate students, who enjoy a great deal of camaraderie within their ranks.

8. Some faculty members have been very successful in technology transfer. Their efforts in this arena have led to the creation of several biotech start-ups and companies. This, in turn, has had a positive impact on the State economy.

9. The summer internship program has been very effective in recruiting highly talented students to the graduate program.

RECOMMENDATIONS

1. The timely completion of the search for a new Department chairperson is strongly recommended. The external review team saw this as a critical necessity.

2. Continued efforts should be made to consolidate the physical facilities into one building or centralized location. All options for co-location of departmental activities should be explored, and the longer-range objective of raising funds for a new building aggressively pursued. Until this becomes a reality, though, immediate attention should be given to providing better basic infrastructure support in Research Park.

3. Although the Department has made significant strides in revising and modernizing its core curriculum, the hiring of new faculty members in the past few years has created opportunities for further curriculum development. The department should continue to examine its graduate course offerings to ensure high quality, appropriate depth and breadth, appropriate balance of core requirements to a student's experience, and inclusion of the most important and timely subjects for graduate education.

4. The Department should examine the following issues regarding the status of teaching assistants: a) graduate student stipends and health benefits are not uniform among research groups; b) the fact that there are no departmental TA positions was seen as a detriment; and c) while all graduates are expected to teach, there seems to be little training for their teaching responsibilities

Submitted by the Ad Hoc Review Committee of the Graduate Council

Stephen Koester (Chair), Modern Dance
Lynne Schrum, Teaching and Learning
Harris Sondak, Management

Memorandum of Understanding
Department of Pharmaceutics and Pharmaceutical Chemistry
Graduate Council Review 2004-05

This memorandum of understanding is a summary of decisions reached at a wrap-up meeting on August 25, 2005, concluding the Graduate Council Review of the Department of Meteorology. A. Lorris Betz, Senior Vice President for Health Sciences; John W. Mauger, Dean of the College of Pharmacy; Steven E. Kern, Interim Chair of the Department of Pharmaceutics and Pharmaceutical Chemistry; David S. Chapman, Dean of the Graduate School; and Frederick Rhodewalt, Associate Dean of the Graduate School were present.

The discussion centered on but was not limited to the recommendations contained in the Graduate Council review completed on April 25, 2005, which addressed the following issues: (1) completion of the search for a new chairperson, (2) consolidating physical facilities, (3) curriculum development, and (4) teaching assistant issues.

At the wrap-up meeting, the working group agreed to endorse the following actions:

Recommendation 1: The timely completion of the search for a new Department chairperson is strongly recommended. The external review team saw this as a critical necessity.

An outside search for a new department chairperson is currently underway. Five candidates have been invited to interview on campus this fall and an offer will be made early in the Spring, 2006 semester.

Recommendation 2: Continued efforts should be made to consolidate the physical facilities into one building or centralized location. All options for co-location of departmental activities should be explored, and the longer-range objective of raising funds for a new building aggressively pursued. Until this becomes a reality, though, immediate attention should be given to providing better basic infrastructure support in Research Park.

Although it is not possible to consolidate all laboratories and offices into one building at this time, laboratories are being relocated so that working groups across the Health Sciences are located in contiguous areas. The College, in collaboration with the Senior Vice President for Health Sciences, is taking steps to locate funding for a new building to house the departments in the College of Pharmacy.

Recommendation 3: Although the Department has made significant strides in revising and modernizing its core curriculum, the hiring of new faculty members in the past few years has created opportunities for further curriculum development. The department should continue to examine its graduate course offerings to ensure high quality, appropriate depth and breadth, appropriate balance of core requirements to a student's experience, and inclusion of the most important and timely subjects for graduate education.

The department is pursuing several activities to address this set of recommendations. First, they are presently evaluating and revising the 2001 curriculum, the curriculum currently in place. As part of this evaluation, the department is seeking feedback from alumni and industry sponsors. Second, attention is being given to new faculty hires who complement programmatic, curricular objectives. Third, the department is forming an industrial advisory board to provide input into future department growth and planning.

Recommendation 4: The department should examine the following issues regarding the status of teaching assistants: a) graduate student stipends and health benefits are not uniform among research groups; b) the fact that there are no departmental TA positions was seen as a detriment; and c) while all graduates are expected to teach, there seems to be little training for their teaching responsibilities.

The department is striving to reduce the discrepancy among teaching assistant stipends and support. It is requested that the department develop a five-year plan to improve training graduate students to be teachers. This plan will consider a) offering a wider range of teaching opportunities than is currently available, b) exploring partnerships with the Center for Teaching and Learning Excellence for teacher training, and c) recognizing enrollment in teaching preparation courses as fulfilling elective requirements. The department will report their progress in these areas in their annual report to the Graduate School.

This memorandum of understanding is be followed by annual letters of progress from the Department Chair to the Dean of the Graduate School. Letters will be submitted each year until all of the actions described in the preceding paragraphs have been completed.

A. Lorris Betz
David S. Chapman
Steven E. Kern
John W. Mauger
Frederick Rhodewalt

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David S. Chapman
Assoc. V.P. for Graduate Studies
Dean, The Graduate School
September 14, 2005