

SIMON FRASER UNIVERSITY
Senate Committee on University Priorities
Memorandum

TO: Senate

FROM: Bill Krane
Acting Chair, SCUP
Acting Vice-President, AcademicRE: Department of Molecular Biology
& Biochemistry

DATE: February 16, 2005

The Senate Committee on University Priorities (SCUP) has reviewed the External Review Report on the Department of Molecular Biology & Biochemistry (MBB), together with the response from the Department and the Dean of Science.

Motion:

That Senate concur with the recommendations from the Senate Committee on University Priorities concerning advice to the Department of Molecular Biology & Biochemistry on priority items resulting from the external review.

The report of the External Review Committee (ERC) for MBB was submitted on June 1, 2004 following the review site visit which took place April 21-23, 2004. The response of the Department Chair was received on September 27, 2004 followed by that of the Dean of Science on October 19, 2004.

SCUP notes that progress has already been made in adopting the advice of the External Reviewers and recommends to Senate that MBB and the Dean of Science be advised to pursue the following as priority items:

1 Resources

- 1.1 The Department and Faculty of Science should continue to evaluate the level, roles and management processes with regard to administrative and research support staff within the Department.
- 1.2 SCUP recognizes that space is in short supply across the university and recommends that the issue of teaching lab space allocation between MBB and Biological Sciences be considered by a continuing joint committee of both Departments and chaired by the Dean. The Dean of Science is urged to take the advice of the ERC and Department to create a transparent mechanism for the allocation and planning of space within the Faculty.

2 Programming & teaching

- 2.1 The Department should endeavor to increase the frequency of offering of graduate courses strictly for graduate students (perhaps including some selected undergraduates), as distinct from graduate courses double numbered with 400 level courses.
- 2.2 The Department should consider extending the graduate teaching evaluation system to all areas.
- 2.3 The Department should create a seminar committee, increase its activity with regard to its seminar program and consider the establishment of the 'pre-seminar' program as a course with credit for attendance.

3 Research

- 3.1 The Department should continue to consider the opportunities afforded by the establishment of the new Faculty of Health Sciences.

4 Administration

- 4.1 The Department should continue to review its policies and procedures regarding its governance and methods of communication with a view to increasing participation and communication among all stakeholders. In particular, it should continue its efforts to involve graduate students in the planning and decision making processes within the Department.
- 4.2 The Department should continue to review its Graduate Handbook to ensure it is sufficiently specific, up to date and serves the purpose of fully informing students, faculty and staff.

c: M. Plischke
B. Brandhorst

EXTERNAL REVIEW COMMITTEE

Department of Molecular Biology and Biochemistry
April 21 - 23, 2004

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External Review of

Department of Molecular Biology and Biochemistry
Simon Fraser University

April, 2004

28 May 2004

Respectfully submitted,
Paul Larkin

A. "Issues of Particular Interest":**1. Are DMBB's resources adequate to sustain its current level of activity and to ensure a strong future in research and teaching?**

The Committee believes that DMBB is a well-resourced Department. Nevertheless, there is a great deal of anxiety within the Department concerning the University's commitment to it. A nearly universally held opinion is that the Department is shortchanged relative to others in the Faculty of Science, and that the resources provided to it do not fairly reflect its student enrollment and research activity. It is true that, as a rapidly growing Department, DMBB is suffering, at least temporarily, from the fact that research allocation formulae consider multiyear averages rather than present levels of activity. We consider that this is a problem that will soon solve itself as DMBB growth begins to level out. However, much Departmental anxiety results from the fact that it funds much of its activity through recovery of revenue provided from short-term salary awards.

Recommendation: The senior administration and the Department should develop a written transition plan to deal with the issue of salary grant expiration and provide for permanent funding of the Department's central activities. Conclusion of a satisfactory agreement would go a long way toward alleviating present concerns.

More specific resource issues are discussed below.

(a) Faculty

Although this is a relatively small Department, it has a dynamic group of Faculty members, many of whom are at an early stage in their careers.

(i) Faculty with salary awards: Because of the recent availability of a number of Faculty research awards (CRC, Michael Smith awards, etc.), combined with the ability of several faculty members to obtain these awards, a significant proportion of the faculty members consider themselves to be essentially "research faculty". On one hand, this is a very positive development in that it allows new Faculty members to establish solid research careers. On the other hand, however, it reduces the involvement of these faculty members in other aspects of Departmental life, and has created some tensions between (mostly) more senior staff who lack salary awards and more junior staff who have them. There does not seem to be a clear vision of how the faculty members with salary awards

will integrate into the teaching and administrative life of the Department once their awards have expired.

(ii) Teaching Faculty: Because of the Faculty research awards and the rapid growth in undergraduate enrollment, a number of teaching faculty (i.e., faculty without Faculty research awards) have been hired and feel they are covering the shortfall in undergraduate teaching. This raises a concern about having a two-tier faculty system. It is not clear that the goals of these faculty harmonize with those of the researchers. Preferably, university teaching and research activities cross-fertilize one another. As DMBB has evolved a system that includes a large number of specialists in either teaching or research, this type of cross-fertilization is minimal.

(iii) Cross-appointed faculty: Although the faculty complement looks adequate at first glance, we note that several faculty members are cross appointed to other Departments. It was not clear if all of these faculty members considered DMBB to be their "home" Department. Moreover, there seems to be substantial opportunity at SFU for individual professors to change their Departmental affiliation; in fact, DMBB was born from a collection of such decisions. While in the case of DMBB a vibrant new entity resulted, in general, we think that the fluidity of Department affiliation contributes to instability in all Departments and fuels interdepartmental rivalries.

2 Recommendation: All courses should benefit from at least some involvement from faculty with active research programs. More use of team-teaching (see below) would allow this recommendation to be implemented without compromising the constraints of the salary grant programs, and would enable better integration of grant holders into the pedagogical activities of the Department.

(b) Support staff

(i) Support staff for teaching: The Department provides an extensive set of required laboratory courses that are resource-intensive in terms of space and technical staff. The technicians for the teaching labs noted that their greatest difficulty was in scheduling their time, especially when the large undergraduate labs are running concurrently. They often have to work long hours, and we were uncertain whether their scheduling and compensation arrangements are in consonance with relevant collective bargaining agreements. If they are not, this is a matter that requires urgent resolution.

3 Recommendation: A committee of tenure-track and tenured faculty should be formed to work with the teaching faculty to carefully examine the content of the laboratory courses with the goal of reducing the duration of the laboratories. Our impression was that this could be accomplished without compromising course quality, perhaps by more utilization of commercially prepared reagents, etc.

4 **Recommendation:** The Departmental Administrator needs to be placed clearly in charge of the time management of the technical staff. She must ensure that collective agreements are respected and the workload of support staff remains manageable.

(ii) **Support staff for research:** There is one full-time position (for a computer systems administrator) and one part-time position (for an equipment maintenance technician). Other research staff members are paid from research grants. For the two Departmental positions, there was general satisfaction expressed with the level of service that they provide, but there were concerns about the long-term funding commitment to the positions. The computer administrator is sometimes placed under multiple, conflicting demands on his time, and the equipment technician experiences difficulties related to inexperienced casual users of shared equipment. These problems could be solved by some administrative changes. For instance, if minimal user fees were established for both computer assistance and equipment use, and if all scheduling were handled through the Departmental office, some of these problems might be avoided. Looking to the future, one can imagine that there may be less work in the area of computer set-up but that virtually all research equipment will involve some sophisticated microelectronics. Based on this, the University might consider creating a single regular technical staff position to service all of the Departmental equipment.

5 **Recommendation:** A technical services committee, consisting of several faculty members and the Departmental Administrator, should be formed to define the duties of Departmental research support staff and to devise a system for equitable management of their time. Consideration should be given to instituting at least a partial cost-recovery system for these services.

6 **Recommendation:** At present, the equipment maintenance technician is a graduate student, who performs the technical task part-time. This is an inappropriate job for a graduate student, and the student's progress through the program is clearly being negatively impacted by holding this job. Technicians and graduate students have very different duties and responsibilities, and the same person cannot hold both positions.

(iii) **Administrative staff:** The level of administrative staff appears to be adequate, but its effectiveness suffers from poorly-defined duties and unclear lines of supervision. One of the administrators is also a part-time faculty member responsible for one of the teaching labs; this seems to be an excessive and perhaps conflicting set of responsibilities. This individual also seems to assume extensive student counseling duties that lie beyond the responsibility of the Department. There also is anxiety about the long term funding for administrative staff positions, which are presently funded through salary grant recovery.

7 **Recommendation:** Ensure that administrative staff positions are base-funded through the long-term Department funding agreement recommended above. ✓

Recommendation: Eliminate overlap between administrative and academic positions, and ensure that the administrative positions have clearly-defined duties and fall under the supervision of the Departmental Administrator.

(c) Research space: In general the research space is adequate, and the researchers appear to be reasonably content with it. More space will need to be made available, however, to cope with future expansion of the faculty. New space seems to be found on an ad hoc basis when new positions become available to the Department. A longer-term plan would relieve anxiety and improve the effectiveness of Departmental recruiting.

(d) Teaching space: The Review Committee felt that an inordinate amount of energy was being devoted to arguments about teaching space. However, to us the teaching lab space seemed excellent. Most of the arguments are not about the space itself but about control of lab space, and of the associated prep rooms. There is a great deal of resentment that arrangements have to be negotiated with Biological Sciences on an annual basis, and that these arrangements often work to the inconvenience of DMBB. It appears that many undergraduate students have migrated from Biological Sciences to MBB but this Department feels very strongly that a corresponding amount of teaching lab space has not been reassigned.

Recommendation: The teaching labs are the focus of one of a number of long-standing disputes between DMBB and Biological Sciences, and to a lesser extent Chemistry. These disputes appear to us to be rooted in the history of the Departmental splits that led to the creation of DMBB, and are fueled by interpersonal rivalries. Our estimation is that both Departments contribute to this problem, and also that they are unable to resolve it among themselves. We propose that the Faculty of Science commission an independent space audit to examine research and teaching space utilization in Biological Sciences, DMBB, and Chemistry, and make binding recommendations as to how the available space might be better utilized.

(e) Administrative space: The administrative space appears to quite limited - although no complaints were voiced in this regard. Again, an objective space audit would identify any possible problems in this area.

2. What faculty complement is necessary to maintain the three core areas?

A good critical mass has developed in the faculty, and in general the faculty felt that they had strong colleagues within the Department. While the Department's recent recruiting has been superb, we do not think it is feasible or advisable for it to continue growing at the same rapid pace in the next few years, although a small number of additional hires may be justified. The fact that the Department has recently hired several new faculty members should help it to keep up with the new "systems biology" approach to cellular and molecular research.

(i) Size and quality in relation to responsibilities and workload, especially in bioinformatics.

Bioinformatics is certainly an area that merits support. Not only is this an emerging area of research but it also provides an important enabling technology to support the other areas of research. The current bioinformatics group seems especially active and productive. It would be important to build on this strength.

Recommendation: The most serious problem in the faculty that could be addressed by recruitment is the lack of mid-career professors; there is an extremely biphasic age distribution within the Department. This also leads to concerns about the Department's ability to find people to assume leadership positions in the short to intermediate term. In addition to considering specific research specialties for new faculty positions, the Department might also consider hiring a productive, mid-career scientist with leadership ability, perhaps through a Tier I CRC. This would help to bridge the gap between junior and senior faculty within the Department.

3. What are the trade-offs between offering a high-quality major program and expanding undergraduate enrollments at the lower division?

The faculty of MBB is tremendously accomplished and very well-funded, and the Department has excellent space and equipment. MBB is therefore an extraordinary training resource for both undergraduates and graduate students, and it attracts outstanding undergraduate and graduate students and provides excellent training in independent research. However, there are several specific areas in which the potential of MBB is not being used to the advantage of the Department or the institution.

Undergraduate

The overall quality of the undergraduate program is excellent. The undergraduates we spoke with seemed content with most aspects of the coursework and their interactions with faculty and the Department. While the program seems to have developed without much planning, it is working well for the most part.

Enrollment management — numbers of majors and amount of service teaching.

The numbers of majors is high, but seems to have leveled off. To accommodate the numbers of students without adding courses or course sections, many classes are large. Nonetheless, most students (at least through the third year) are being served reasonably well at the current time, despite the large class size.

Recommendations. There does appear to be the need for additional secretarial/advisory support for the majors. It is important to recognize that the role of the Department in this capacity must be distinct from that of student advisory and counseling services that are better handled by at the University or Faculty level. Non-tenure track faculty may be devoting too much effort to advising.

Trade-offs between high quality major and expanding enrollments

One of the most important missions of an undergraduate program is to inspire and educate those students who will go on to independent professional careers as faculty and

researchers. Because of the quality and accomplishments of its faculty, MBB should be the perfect home for this sort of undergraduate. Training these students becomes particularly important in year four, when they typically seek challenging courses and interesting and independent laboratory research, distinct from large teaching laboratories with set protocols. However, there are relatively few fourth year course offerings, and many have very large enrollments.

12 **Recommendations:** Establish a combined BS/MS program that would allow honors undergraduates to take courses that are specially designed for and largely restricted to graduate students (in contrast to the current 400/800 courses, which are large and attempt to teach both groups). This would provide an excellent training opportunity for students; and it would also provide faculty with an incentive to teach excellent graduate courses, in the hope of enticing these students to work in their laboratories. This combined program could include an opportunity for laboratory rotations in year five.

Course offerings

The increase in numbers of faculty has not been accompanied by a proportional increase in the amount of teaching done by the Department, even when the high numbers of teaching buyouts are taken into account. The scope of the course offerings is reasonable, but could be expanded with the additional faculty on board. The fourth-year curriculum is not well-planned. Many courses are large, and include both undergrads and graduate students despite their different educational needs. There was relatively little faculty "ownership" of courses evident, and a strong teaching culture was not being developed among most junior faculty. This was blamed on the numbers of buyouts, but this does not fully explain either the quantity of teaching, or the attitude toward teaching. In the long run, the lack of commitment to teaching may present a real threat to the mission of SFU.

There appears to be significant duplication between MBB and Biological Sciences, especially in years two and three. Some of this may be inevitable, since the two Departments are competing for resources pegged to undergraduate enrollment; however the current rivalry is not in the interests of the students or the institution. Unfortunately, there appears to have been little cooperation between the Departments in determining how to allocate responsibility for specific aspects of undergraduate training. While individual faculty members are on good terms with one another, there is clearly competition at higher levels, accompanied by duplication of efforts and squabbling over resources. While a certain level of creative tension may be an incentive to achieve, the existing rivalry is not in the long-range interest of the institution or of these two Departments.

Laboratory courses. Currently, undergraduate training in MBB derives much of its unique identity from several demanding laboratory courses. These courses consume considerable resources in terms of teaching effort and laboratory space. They are not clearly directed by specific tenure-track faculty. There appears to have been no discussion of whether such intensive laboratory training is necessary for all students; or whether some students might not be better-served by a different set of requirements. For example, honors students directed toward graduate school might prefer to substitute

independent research in a faculty laboratory for the course requirement; while students planning to work as technicians in the biotech industry might need more varied but less intensive hands-on experience. The students we spoke with questioned whether the laboratories might begin earlier (second year). Those with specific interests (e.g., structural biology, informatics) felt that the rigid laboratory requirement diminished their opportunity to explore those interests.

The laboratory courses provided a major source of discontent at many levels. There were many complaints about lab teaching space and the relative allocation of lab teaching space to Biological Sciences and MBB. There were many discussions of the need for more teaching space and new teaching space. However, the reviewers just did not perceive this as a real problem. The walk-through showed that the undergraduate laboratory space is absolutely superb. The numbers of students accommodated per session seemed low. There seemed to have been little attempt to get "out-of-the-box" to find solutions to issues presented to the reviewers as major and intractable problems. One simple example. Apparently, despite the advertised space crunch, labs are given only on Tuesday, Wednesday and Thursday. This leaves Monday for prep time, which is realistic; but there was no good rationale for not teaching labs on Friday, even recognizing that this might mean a TA would need to come in on the weekend to remove plates from an incubator or finish up other details of an experiment.

Recommendations. Within MBB, the numbers of laboratory courses required and their content need to be carefully re-examined. Can laboratory course requirements be better-tailored to individual students? Can the experimental design be modified so that labs do not require so many teaching hours, and finish on time? Most institutions just do not provide the level or extent of laboratory instruction found in MBB. Comparison with peer institutions could provide a useful guide for realistic changes in the curriculum. It might also be necessary to set the bar higher for admission to the laboratory, or to the major. In addition, MBB should consider separating their 400-level courses from graduate offerings, ideally by offering new courses for graduate students and honors undergraduates.

MBB and Biological Sciences need to work together to develop second- and third-year courses in which faculty members from both Departments share teaching, and to work out some short-term plan for use of teaching laboratory space. It is likely that the administration will need to guide or mediate this planning. In the long run, it would be very appropriate for SFU to examine the question of whether more teaching space is necessary or useful, or whether existing space might be adequate if used realistically by all Departments involved. This might best be done by employing an external consultant to examine current space use.

4. Proposed strategies for developing the DMBB graduate program, including possible diploma programs.

The MBB faculty are outstanding researchers and most are excellent mentors to their graduate students. The students we spoke to were very engaged in research and spoke highly of the scientific mentorship in MBB. Moreover, the SFU graduate students had, on their own initiative, conducted a poll for the external review. This poll (which

sampled over 40 from more than 60 current students) confirmed that graduate students in MBB are very satisfied with their research experience.

Expectations and requirements

To their great credit, the students did look beyond the excellence in basic research, and provided very specific and useful comments for improvements of the coursework and the administration of the graduate program. In particular, they perceived an absence of clarity about graduate funding, expectations, and procedures. The students were not aware of a graduate handbook that spells out basic rules, such as how much research is enough for graduation. Graduate students perceived an inequality of expectations among different advisors. We did not have the time to probe this perception in depth, or gather statistics about time-to-degree in the various laboratories, but the lack of clarity they described in the context of graduate education fit with what we heard in other contexts. Graduate students were concerned that their progress was not monitored in detail. Although they do meet with research committees on an annual basis, the paper trail is minimal: the mentor is not required to produce a written report on progress, and typically a year of hard work is summarized by checking off a few boxes on a form.

Recommendations. If a Handbook for Graduate Students in MBB exists, it should be advertised better; if not, it should be created. If there are SFU rules which constitute a default position for Departments which do not write their own rules, then those should be provided to each student on entry into the program and explicitly applied. Require each advisor to monitor and report on the progress of each student in an annual written report that discusses progress to date and goals for the future. This report would be provided to the student and all members of the research committee after each committee meeting. By the end of year 2 (master's) or year 4 (Ph.D.), the progress report would document agreed-upon goals for completion of the degree, and set a timetable for completion. Both goals and timetable would become more specific the closer a student gets to completion. The time to degree in each laboratory should be public information, provided to a Graduate Education Committee and available to all prospective students. Research committees should be made aware of laboratories that deviate consistently from an optimal timescale, to provide extra aid for students who might find that their advisors have unusual expectations. Conversely, MBB should adopt rules governing the amount of time a student may ordinarily be supported during pursuit of a graduate degree. These rules should be designed to protect both students and faculty from unrealistic expectations, while taking into account unusual situations (childbirth, family emergencies, change of laboratory, etc.).

The proposed Diploma program had a very low profile within the Department. Many faculty seemed unaware of it, and essentially none considered it to be a high priority. Given the rapid growth of the Department, its need to consolidate a great deal of change, its present difficulties with graduate courses, and its priority for high-quality research, we do not consider that a Diploma program is consistent with the goals of the Department.

Funding and student employment

Some students stated that funding was uneven from laboratory to laboratory, but we did not investigate this in detail. There may be uneven allocation of TAships. In at least one case, a graduate student was assigned the job of supervising and cleaning Departmental instruments. This was time-consuming, limited her progress in research, and did not encourage development of skills that will be useful to professional progress.

Courses

Graduate students stated that the existing graduate courses are mainly 400/800 courses, designed for undergraduates, and with large enrollment and little opportunity for the critical approach that is the heart of graduate education. This creates an especially difficult situation for students who were undergrads at SFU and have already taken existing graduate courses but must still fulfill what some regard as onerous course requirements to obtain a degree. The course deficit appears to reflect the fact that teaching is not made a priority for MBB faculty, either by the Department, or because this is a useful mechanism for graduate recruiting. Because all graduate students have chosen laboratories before they attend courses, there is little incentive for a faculty member to communicate excitement about a field to students working in other laboratories. Teaching is not evaluated in graduate courses, removing one more incentive for good teaching.

Recommendations: More small-enrollment, intensive graduate courses with enrollment restricted to graduate students! If a few honors undergraduates are admitted to these courses (e.g., in a BS/MS program), this would create a real incentive to teach. If these courses focus on primary literature and are taught by a team of faculty members, they would be fun for both faculty and students. Create a formal evaluation system for graduate teaching. Make evaluations public (not just numbers, but all comments fit to print), so that students may choose among courses based upon evaluation. Use teaching evaluations as at least one of the determinants for promotion and for recommendations for external recognition of faculty.

Seminar program

The seminar program is useful as an educational tool and as a means for uniting a Department with relatively diverse research interests. It also provides visiting speakers unfamiliar with SFU with an opportunity to see what an extraordinary institution this is, and this in turn enhances the success of SFU faculty and students. For these reasons, it should be seen as a priority for Departmental resources and effort. Students asked that the seminar program occur with greater regularity, and that attendance be encouraged. One rationale raised by students for not attending seminars is that many seminars are not readily comprehensible to the diverse graduate students in MBB.

Recommendations: There appeared to be no seminar committee charged with the seminar program, and organizing an excellent program is a huge responsibility to devolve upon a single faculty member. If there is reorganization of the committee structure in MBB, the seminar program should be added to the list. This committee could then ensure that seminars occur regularly, and institute a mechanism to ensure that all students can learn something from each seminar. Students suggested food as a lure. At some

schools, there is a pre-seminar session at which graduate students and a local faculty member (often the host) meet to discuss one or two important papers from the speaker's laboratory. This brings students to a level where they can understand enough so that going to a seminar is worthwhile. The pre-seminar program could be constructed as a course with credit for attendance.

Enfranchisement and empowerment of students.

Graduate students did not feel that their views were being solicited or respected in all areas. The most telling example may have been that graduate students did not know about the external review until the week before it took place. An unfortunate incident also recently occurred when the graduate representative to the search committee, normally a voting member, was disenfranchised without explanation. These omissions may reflect neglect, or an overall loose structure without clear guiding principles or procedure.

17 **Recommendations:** Clarify procedures. Adding students to Departmental email lists may be one simple mechanism to improve the lines of communication. In addition, there should be more inclusion of graduate students in planning and decision-making, particularly in areas that affect them directly such as courses, curriculum, and requirements for students. This participation will enhance their ability to function effectively when they themselves become faculty members.

5. Strategies for the Department to engage in cooperative research and teaching programs with the new Faculty of Health Sciences.

As described in the "Proposal for a Faculty of Health Sciences" that was provided to the Committee, the mandate of this new entity is rather broad, and encompasses areas of basic biomedical research that DMBB is involved in. It is easy to envision DMBB researchers with an active role in the Infectious Disease, Biomolecular Interactions, Aging and Chronic Illness, and Brain Function and Development groups, and it is similarly easy to imagine that new Faculty of Health Sciences recruits, who are basic biomedical researchers, may desire affiliation with DMBB.

However, it was difficult for the Committee to grasp exactly how the initial stages of development of the Faculty of Health Sciences are likely to proceed. Scheduling conflicts prevented us from meeting its Acting Dean, and different individuals associated with the Faculty provided us with rather differing views, particularly concerning how important basic biomedical research will ultimately be in this new unit. Clearly, the first area to be developed in the new Faculty will be population and public health, as evidenced by the submission of the preliminary MSc program in this field to graduate studies in January 2004. If population and public health are indeed the major foci of the new Faculty, then the opportunities for cooperation with DMBB in research and teaching will be limited.

18 **Recommendations:** DMBB already faces numerous organizational and structural challenges consequent to its rapid growth and to its transition from an Institute into a

Department. At this time, another major reorganization or realignment involving DMBB and a new Faculty would appear to us to be ill advised. However, the Faculty of Health Sciences potentially will provide many new opportunities for individual DMBB researchers to establish research and teaching links, and DMBB will provide the Faculty with a proximate, dynamic group of biomedical scientists that will help enable its recruiting and program development activities.

B. "Other areas to be considered"

In many cases we have discussed these areas in our responses to the specific questions posed above. Some additional impressions follow.

2. Faculty.

Teaching and research contributions, including the level of external research support.

We believe we have commented fully on the teaching situation in the material above.

Research activity is strong and the level of external research support is very good. Almost all the faculty members have highly active research programs, and many are publishing in top-tier international journals such as PNAS, Molecular and Cellular Biology, Current Biology, Journal of Biological Chemistry, etc. The quality of the research programs of new recruits is very high, and the Department should be commended for its ability to attract such strong candidates.

3. Administration.

While the Departmental administration is excellent in many ways, a number of problems were noted. We felt that the administration of the unit did not fully reflect its transition from "Institute" to "Department". Well-established procedures that one expects in a Department either do not exist, or are not perceived by many of the members to exist. Essentially, the administration needs to be more formalized and more transparent. Responsibilities should be clearly delegated and institutional rules strictly adhered to. The rules probably are being followed, but it is not entirely clear to everyone involved that this is the case. Our impression is that a somewhat autocratic leadership style may be an impediment in some cases.

19. Recommendation: Clear lines of command need to be established within the Department, and substantial delegation of responsibilities from the Chair to the Departmental Administrator, and to faculty committees, needs to be achieved. Faculty committees, at least for important matters such as graduate training, curriculum development and review, and technical/space resource allocation, need to be provided with a real role in Departmental governance. Communication has to be improved so that

all Departmental stakeholders (students, staff, teaching, tenure-track, and tenured faculty) know what is going on, and feel that they have a say.

4. Connection of the Department within and outside the University.

The potential connection between DMBB and the new Faculty of Health Sciences was discussed above. An important challenge for the Department is to improve its relations with neighboring Departments within the Faculty of Science, particularly Biological Sciences and Chemistry. We note that, on the level of individual faculty members, substantial collaboration and cooperation occurs between DMBB and these Departments. There also is often representation on DMBB faculty search committees from members of Biological Sciences or Chemistry, which is a positive development. But rivalries remain, and these impede the ability of all the involved Departments to best carry out their missions in research and teaching. An independent space audit, as we suggested above, would be an important first step in settling a major issue that is causing continual friction among these units.

We are not aware of extensive formal collaborative arrangements between DMBB and units at other institutions. However, many individual DMBB faculty collaborate widely both within Canada and abroad. DMBB members also do their share on scientific review committees and the like.

5. Future Directions.

DMBB is a strong Department. As the new faculty members gain experience and their programs mature, it is likely to continue to improve and gain stature. DMBB has the clear potential to be one of the top two or three Faculty of Science-based molecular biology units in Canada.

We believe the challenges this Department faces can be overcome, and we have made several recommendations in the material above which suggest future directions the Department may wish to consider, and which we intend to be constructive in helping the Department to achieve its full potential.

**Departmental Response to the External Review of the
Department of Molecular Biology and Biochemistry
Simon Fraser University
Sept. 25, 2004**

The Department of Molecular Biology and Biochemistry (MBB) responds here to the report of the External Review Committee (ERC) submitted after its visit in April, 2004. In preparing this response, the MBB Undergraduate Curriculum Committee (DUCC, including its student representative) met, the Graduate Studies Committee (DGSC) met with members of the MBB Graduate Caucus, the Department Chair met with the President of the MBB Student Union, and the MBB faculty members held a meeting to discuss the report. Various faculty, staff and students provided extensive written input to the Chair, who prepared a draft of this response for review by faculty, staff, and students. A penultimate draft of this response was posted for a month on the MBB website seeking comments, and students were alerted to this.

Overall, the Department is gratified that it is highly regarded in most respects by the ERC and is enthusiastic about many of the recommendations made by the ERC. However, we are surprised and disturbed about some of the comments made and conclusions drawn, often with little explanation or documentation. Moreover, some statements by the ERC sometimes contradicted information provided in the Self Study Document (SSD) prepared by MBB or responses to questions that arose in meetings with the ERC. Here, MBB has extracted all of the specific recommendations made by the ERC and responds to each. In the Appendix, we respond to some statements by made by the ERC in the report, particularly those which we believe are inaccurate or require action, even if not presented as recommendations.

To facilitate discussion the recommendations are quoted in their entirety and have been numbered, but remain in the same order in which they appear in the report of the ERC.

A. "Issues of Particular Interest":

1. Are DMBB's resources adequate to sustain its current level of activity and to ensure a strong future in research and teaching?

1. Recommendation: The senior administration and the Department should develop a written transition plan to deal with the issue of salary grant expiration and provide for permanent funding of the Department's central activities. Conclusion of a satisfactory agreement would go a long way toward alleviating present concerns.

Response: MBB agrees and urges a rapid implementation, preferably retroactive to the beginning of this fiscal year (2004). In agreement with the ERC, MBB considers "central activities" to include secretarial staff, the computer system/instrumentation consultant, and part time technical support for equipment. MBB wants to be confident that resources

(base budgeted secretarial and technical support, non-salary base budget, and space) will be transparently and equitably allocated within the Faculty of Science based on current and projected requirements.

(a) Faculty

2. Recommendation: All courses should benefit from at least some involvement from faculty with active research programs. More use of team-teaching (see below) would allow this recommendation to be implemented without compromising the constraints of the salary grant programs, and would enable better integration of grant holders into the pedagogical activities of the Department.

Response: We fully agree with the *sentiment* behind this recommendation, but disagree with the need for the recommendation. It is not possible to have tenure track faculty involved in teaching all courses in all semesters, particularly the lab courses. All MBB lab courses are newly designed and have had extensive involvement of tenure track ("research") faculty within the last three years, and all but one (the lab course MBB 309) have been taught by tenure track faculty in the past year. All lecture courses have regular or exclusive involvement of tenure track faculty. There is only one base-budget funded teaching faculty (Lecturer) position in MBB (plus 18 tenure track positions, not including the two newly hired tenure track faculty who have not yet arrived), a smaller proportion than in other laboratory science departments at SFU and most other Canadian universities. In addition, there are 1.5 replacement Lecturer positions paid from faculty salary recovery funds. All tenure track MBB faculty hold grants and have active research programs, and all are actively engaged in undergraduate teaching. The Lecturers teach not only lab courses, but 200 and 300 level lecture courses. All the Lecturers have recent, sophisticated research experience, and one remains actively engaged in research. MBB agrees that tenure track faculty must continue to have an ongoing role in keeping the lab courses up to date, but considers it entirely appropriate that Lecturers/Lab Instructors have the predominant instructional responsibilities for the lab courses that normally have 3 to 5 sessions per week.

In general, MBB does not consider team-teaching of undergraduate courses to be the best pedagogical approach (based on our experiences in departments where this is common practice). Team-teaching is done in some courses (e.g., MBB 322 and 422), and may be done more in the future, especially for graduate and breadth courses. We prefer the model of a having a single instructor responsible for teaching the entire course in a given semester because it promotes continuity/commitment and more "ownership" of courses. We suspect that the ERC did not fully appreciate the trimester system at SFU and the need to teach many of our courses two or three times each year, usually involving different faculty each semester (reducing the number of different courses taught per faculty member in comparison with many universities). Its failure to mention the very active MBB Co-op program is consistent with this suspicion.

(b) Support staff

3. **Recommendation:** A committee of tenure-track and tenured faculty should be formed to work with the teaching faculty to carefully examine the content of the laboratory courses with the goal of reducing the duration of the laboratories. Our impression was that this could be accomplished without compromising course quality, perhaps by more utilization of commercially prepared reagents, etc.

Response: All three wet laboratory courses are newly designed (since the Department began four years ago) under the auspices of the Undergraduate Curriculum Committee (which includes tenure track and non-tenure track members and an undergraduate). They are operating quite effectively (based on student surveys and assessment of lab reports), with the exception of a few exercises that are being revised (these courses are continually assessed and revised to keep them current and effective). A new lab manual will be developed in MBB 308 during Lecturer Don Sinclair's development semester (2004-3) and will include some revised exercises. All of the exercises have been tested and can easily be completed within the scheduled laboratory time frame (as attested to by many students, including those who met with the ERC), but some students do not come to the labs sufficiently prepared to perform the exercises. The courses try to balance cost- and time- effectiveness with hands-on experience. For instance, to use an example provided by the ERC, we believe that students do learn something useful from pouring a gel. In general, prepared materials are very expensive and the current mix of locally prepared and purchased materials was chosen for cost and pedagogical effectiveness. In order to cope with the large increase in enrollments in these courses, the Department has made considerable progress in reducing the work burden on the teaching technical staff in preparing solutions, materials, etc., for lab courses. The main issue for their workload is its very uneven distribution due to fluctuations in availability of teaching lab space (3 wet-lab courses are taught in the summer, 1 in the Fall, and 2 in the spring). This is an inefficient situation that arises because the Department has only one teaching lab under its control and must "borrow" other teaching lab space that is not always available and never on a long term basis.

4. **Recommendation:** The Departmental Administrator needs to be placed clearly in charge of the time management of the technical staff. She must ensure that collective agreements are respected and the workload of support staff remains manageable.

Response: In Chemistry and Biosciences at SFU the technical staff report to a Laboratory Coordinator who has technical expertise, not the DA. The MBB Departmental *Assistant* (DA, not a Departmental *Administrator*) does not have background in science and is not able to provide supervision of the day to day activities of technical staff, though she records vacation time, overtime, and sick leave reported to her. Unless the Department were to create a position comparable to that of Laboratory Coordinator, formal supervision of the duties of the technical staff must remain the responsibility of the Department Chair, *as insisted upon by the technical staff and DA*. In actual practice, the activities of the teaching technicians are supervised on a weekly

basis by the faculty members responsible for the laboratory courses and by the Undergraduate Advisor/ Program Coordinator (a ½ time APSA position). The technicians discuss anticipated temporary deviations from the normal work week with the Chair on a semesterly basis, who consults with the DA to insure that collective agreements will be respected. There may have been some confusion about these relatively new supervisory arrangements.

5. Recommendation: "The university might consider creating a single regular technical staff position to service all of the Departmental equipment." A technical services committee, consisting of several faculty members and the Departmental Administrator, should be formed to define the duties of Departmental research support staff and to devise a system for equitable management of their time. Consideration should be given to instituting at least a partial cost-recovery system for these services.

Response: We agree with the intent of this recommendation, but it is based on some misconceptions.

The Department has no research support staff supported on the salary base budget. While we are not aware of any significant concerns about the management of the time of the temporary research support staff, MBB will create a Research and Resources Committee that will oversee the creation and operation of technical services in the Department. The computer systems/instrumentation consultant position already includes a role in maintaining and providing instruction on other sophisticated equipment. His role is not strictly for research. He also provides teaching support for faculty and systems support for the MBB computer teaching lab and MBB staff. He presents or arranges for lectures for faculty and graduate students on computational topics and may become more involved in teaching appropriate parts of courses and workshosp. As stated in the SSD, MBB already has a partial or full cost recovery system in place for nearly all of its equipment and facilities. For many tasks performed by the computer systems consultant, this would not be practical and is not the practice in other departments in the Faculty.

6. Recommendation: At present, the equipment maintenance technician is a graduate student, who performs the technical task part-time. This is an inappropriate job for a graduate student, and the student's progress through the program is clearly being negatively impacted by holding this job. Technicians and graduate students have very different duties and responsibilities, and the same person cannot hold both positions.

Response: The person in question was a research technician having this role before she became a graduate student. While the job slightly delayed her progress in the Ph.D. program, she pointed out to the ERC that only by holding the job was she able to enter the MBB graduate program as the main bread winner for her family, complete a Ph.D. thesis, and find employment as an SFU faculty member (starting in September as a Lecturer in Biosciences).

MBB agrees such *ad hoc* arrangements are not always in the best interests of the student/employee, but we are proud of this one. In many departments at SFU, students holding Research Assistantships are expected to perform services that are not directly

related to their thesis research; this is not the norm in MBB. MBB wants base budgeted Faculty salary support for this kind of research technical support. In the interim, we have resorted to use of hourly appointments to fund temporary positions filled with applicants having the appropriate skill set. Using funds from the non-salary base budget, a technician working a research lab has been hired part-time on a temporary basis to perform some of these essential services, including maintenance of the autoclaves, dishwasher, film developer, water polishers, and gel documentation systems; instruction for new users in the safe and proper use of some kinds of equipment; and managing equipment maintenance and repairs. More time is needed to provide oversight of the use of more sophisticated equipment such as spectrometers and imagers.

7. Recommendation: Ensure that administrative staff positions are base-funded through the long-term Department funding agreement recommended above.

Response: MBB fully agrees, but the positions in question need to be clarified. Of the three clerical positions in the Department office (Chairs Secretary, Graduate Secretary, and Undergraduate Secretary/receptionist), only 1.5 positions are base budget funded but all are essential. MBB has recently received a written commitment from the Dean to fund these (CUPE) clerical positions, but the salaries would continue to be recovered from the Department until the fiscal year 2006-7. In response, the Department passed a motion asking that the salaries be covered beginning this year so that the funds recovered from faculty salaries can be used more effectively and appropriately (for teaching replacement and enhancement of research activities).

As in comparable departments in the Faculty, the computer systems/instrumentation consultant position (APSA) is essential for the teaching and research operations of the Department and must be base budget funded before the faculty salary recovery income disappears. The Dean has refused to commit to doing this. As noted in 5, MBB also requires on-going funding for a part-time technician to perform oversight and basic maintenance of its wide array of common use equipment (much of it used by many members of the SFU research community not affiliated with MBB).

8. Recommendation: Eliminate overlap between administrative and academic positions, and ensure that the administrative positions have clearly-defined duties and fall under the supervision of the Departmental Administrator.

Response: This recommendation apparently concerns the half-time Undergraduate Advisor/Program Coordinator who is also a half-time Lecturer, roles created at different times. The role of Undergraduate Advisor was previously performed by a tenure track faculty member in addition his normal teaching duties. The fact that the ½ time advisor position (APSA) is filled by a person who is also a ½ time lecturer only creates problems when the work load in both positions is especially heavy (during registration periods near the end of the semester); this was exacerbated by the implementation of SIMS. It is most convenient for the incumbent to report to a single person, in this case the Chair because she is also a faculty member. In some other SFU departments (e.g., Biosciences) the

Advisor does not report directly to the DA or the Chair.

9. Recommendation: The teaching labs are the focus of one of a number of long-standing disputes between DMBB and Biological Sciences, and to a lesser extent Chemistry. These disputes appear to us to be rooted in the history of the Departmental splits that led to the creation of DMBB, and are fueled by interpersonal rivalries. Our estimation is that both Departments contribute to this problem, and also that they are unable to resolve it among themselves. We propose that the Faculty of Science commission an independent space audit to examine research and teaching space utilization in Biological Sciences, DMBB, and Chemistry, and make binding recommendations as to how the available space might be better utilized.

Response: MBB agrees that the allocation of space (laboratory and office) in the entire Faculty of Science should be examined and reallocated on the basis of agreed priorities and current requirements. MBB is confident that any examination will conclude that the current allocation to Biosciences of 4 times more teaching lab space per major or upper division student is an inequity that must be rectified. Reallocation of teaching space and other resources should have occurred when MBB was formed as a new department. MBB has repeatedly proposed the transfer of control of one teaching lab from Biosciences to MBB (e.g., SSB 8121), which would still leave Biosciences with 60% more teaching lab space in SSB to service fewer students. MBB is not prepared to wait for the completion of the TASC 2 building (in Fall of 2006 or later) to be confident that it can mount its teaching program. MBB requires assurances that a second teaching lab will be available at least three days a week in *all* semesters in 2005 and beyond. The Dean of Science recently facilitated an arrangement whereby a second teaching laboratory will be available to MBB each semester through the summer of 2006, when the TASC 2 building is scheduled for completion, releasing some space in SSB that may now be used for MBB teaching. In return, MBB will no longer give priority for entrance into MBB 308 to its majors and minors when using space "loaned" by Biosciences. MBB would be happy to see the Dean of Science office allocate teaching lab space on the basis of proven needs, rather than perpetuating the current "ownership" system based on history and resistance to change.

MBB does not believe that space reallocation requires an expensive external consultant. An effective Faculty of Science space committee having clearly defined priorities for use of space should be able to create an equitable plan to reallocate space among departments and plan for use of new space. MBB insists that any audit of laboratory space should involve the entire Faculty, and preferably Applied Sciences as well. Moreover, the audit must include the allocation of office space, for which the highest priority use should be for faculty members. New faculty in particular must be provided with an office upon arrival, something that has not happened in MBB in the recent past.

2. What faculty complement is necessary to maintain the three core areas?

10. Recommendation: The most serious problem in the faculty that could be addressed by recruitment is the lack of mid-career professors; there is an extremely biphasic age distribution within the Department. This also leads to concerns about the Department's ability to find people to assume leadership positions in the short to intermediate term. In addition to considering specific research specialties for new faculty positions, the Department might also consider hiring a productive, mid-career scientist with leadership ability, perhaps through a Tier I CRC. This would help to bridge the gap between junior and senior faculty within the Department.

Response: We assume the ERC is referring the paucity of Associate Professors in MBB, since there is not a biphasic *age* distribution for MBB faculty. This situation is quickly changing as Assistant Professors are promoted, and Associate Professor Lynne Quarmby joined the Department in September, 2004. MBB would be happy to have a CRC Tier I to fill. MBB would welcome the opportunity to advertise to fill aP4 openings at the AP level when appropriate, and has permission to do so for the Bioinformatics position. SFU will submit an LOI for a BC Leadership Chair in Pharmaceutical Genomics and Bioinformatics that would be held in MBB by an identified senior scientist.

MBB believes the most serious faculty staffing issue facing it is the large and growing numbers of FTEs and majors per tenure track faculty member in the Department. This issue can be addressed by providing the opportunity to hire more MBB faculty (with attendant space and other resources) or by limiting enrollments.

3. What are the trade-offs between offering a high-quality major program and expanding undergraduate enrollments at the lower division?

11. Recommendations. There does appear to be the need for additional secretarial/advisory support for the majors. It is important to recognize that the role of the Department in this capacity must be distinct from that of student advisory and counseling services that are better handled by at the University or Faculty level. Non-tenure track faculty may be devoting too much effort to advising.

Response: We agree that there should be more support for the Advisor, preferably in the form of increased secretarial support. The Undergraduate Advisor performs program advising, oversight of graduands, recruitment functions, assessment of scholarship applications, course scheduling, articulation of BC courses, waivers of course requirements, etc. Some of the Advisor's duties, especially those related to data entry, can be and are performed by secretarial staff, but this is done on *ad hoc* basis when there is time available. The Advisor does not do personal counseling, but does refer students in need to the appropriate university services. She may sometimes be overly attentive to students having problems, but that is because she cares about the students and they respond to this. All students when declaring a major discuss with the Advisor their career goals in relation to their academic program. That is an essential but time consuming role of the Advisor that she performs well.

12. Recommendations. Establish a combined BS/MS program that would allow honors undergraduates to take courses that are specially designed for and largely restricted to graduate students (in contrast to the current 400/800 courses, which are large and attempt to teach both groups). This would provide an excellent training opportunity for students; and it would also provide faculty with an incentive to teach excellent graduate courses, in the hope of enticing these students to work in their laboratories. This combined program could include an opportunity for laboratory rotations in year five.

Response: While it is not entirely clear what is being proposed, MBB will consider the creation of M.Sc program for MBB honors students based courses and research rotations. It seems likely that the B.Sc. would presumably be conferred upon completion of the degree requirement, not at the same time as the M.Sc. There is little enthusiasm in MBB for a course-based M.Sc. program and the Department already has a very active Honors Program involving a 15-credit Independent Studies Semester. It is not clear if the proposed program would generate substantial increases in enrollment demand for graduate level courses, but it would likely increase the number of SFU graduands doing graduate work at SFU (already about 2/3 of the graduate students, which we consider undesirably high).

13. Recommendations. Within MBB, the numbers of laboratory courses required and their content need to be carefully re-examined. Can laboratory course requirements be better-tailored to individual students? Can the experimental design be modified so that labs do not require so many teaching hours, and finish on time? Most institutions just do not provide the level or extent of laboratory instruction found in MBB. Comparison with peer institutions could provide a useful guide for realistic changes in the curriculum. It might also be necessary to set the bar higher for admission to the laboratory, or to the major. In addition, MBB should consider separating their 400-level courses from graduate offerings, ideally by offering new courses for graduate students and honors undergraduates.

MBB and Biological Sciences need to work together to develop second- and third-year courses in which faculty members from both Departments share teaching, and to work out some short-term plan for use of teaching laboratory space. It is likely that the administration will need to guide or mediate this planning. In the long run, it would be very appropriate for SFU to examine the question of whether more teaching space is necessary or useful, or whether existing space might be adequate if used realistically by all Departments involved. This might best be done by employing an external consultant to examine current space use.

Response: The ERC did not examine course syllabi nor did it ask many questions about course content, especially when it met with the MBB Undergraduate Curriculum Committee. The MBB laboratory courses have been carefully designed and are almost brand new courses, of which we are quite proud. These were developed after much consideration of lab courses at many other universities. Another 400 laboratory course in physical biochemistry is being planned, but implementation is awaiting arrival of new

faculty members to replace 3 recently departed biochemists who taught earlier versions of this course, as well as the availability of teaching lab space and equipment. MBB majors are required to take 3 upper division lab courses: 308, 309, and a choice of 1 400-level lab course (with presently very limited choice that will hopefully be improved with the implementation of the physical biochemistry lab course, and some possible new lab courses in Biosciences). In a revised curriculum, the Biosciences Department plans to require 5 upper division lab courses of its Cell and Molecular stream majors, so the lab course requirement for MBB is modest in comparison with Biosciences, or several other Canadian Biochemistry/Molecular Biology departments.

We believe that most of the MBB lab exercises are well designed and can be easily completed by prepared students in the allotted time. The exercises are assessed and revised on a continuing basis, and some have been shortened. Unfortunately, some students do not come well prepared, causing staff to work overtime and interfering with other students. So that its majors are not delayed in completing graduation requirements due to enrollment limitations, MBB will reluctantly consider the implied recommendation to drop the requirement for a 400 level lab course (or allowing broader substitution). However, the popularity and strong student reviews of MBB 432 suggest that there will continue to be considerable enrollment pressure for MBB 432. MBB believes that it is important for its majors to have the opportunity to take at least one sophisticated 400 level lab course that emulates current research programs. However, it may be that some students do not need or want it.

We know that the group of undergraduates who met with the ERC echoed our conviction that the MBB laboratory courses are excellent and form a crucial part of the MBB majors program, but they may have complained about required lab courses in other departments. While many universities have reduced or eliminated laboratory courses to reduce operating costs, there is much evidence that their students have not been well served by these decisions, and some departments are restoring lab courses. We believe that MBB has a program requiring an appropriate number of well designed, affordable lab courses that serve our students well. Based on a recent survey, we know that employers of Co-op students have high praise for MBB 308 and 309 because they provide students with useful research skills.

Many MBB students and faculty (and Co-op employers) believe that a 200 level MBB lab course would be very useful, but space and other resources are presently not available, nor would it fit into the currently busy second year program.

MBB is concerned that some innovative aspects of our curriculum in addition to the lab courses were not mentioned by the ERC. For example, its joint majors programs with Business and Computer Science are unique in Canada and are attracting high quality applicants.

MBB and Biosciences already share teaching responsibilities for MBB 221, BISC 202, and BISC 333. They also allow cross substitution of courses toward degree requirements, sometimes on an *ad hoc* basis. The programs are virtually identical in the

first 2 years (allowing easy change of intended major, which is normally not declared until the third year). TA appointments are shared between the two Departments in an effort to have the best qualified TAs for each course. We agree there should be more cooperation in curriculum development and planning, as well as planning for faculty recruitment. An equitable allocation of teaching lab space and equipment would promote better cooperation. An agreement on long term teaching responsibilities would also be helpful, though this is now cooperatively planned on a two year cycle with few problems.

Both Departments realize that the growth in numbers MBB majors has not been at the expense of Bioscience majors in its Cell and Molecular Biology Stream, which has seen only a slight decline in numbers. This provides even more incentive for cooperation and equitable allocation of resources to allow both of the largest majors programs in the Faculty of Science to flourish. Neither Department is interested in competing with the other to maximize its FTEs. On the contrary, both Departments are faced with difficulties in managing their enrollments, Biosciences primarily at the first year level and MBB at the upper division level.

MBB has a strong record of reaching out to cooperate with faculty holding appointments in other departments. It has many Associate Members, who often supervise graduate students in the MBB program. MBB provides access to its equipment and facilities to all SFU faculty and their students willing to participate in the program of hands on training and partial cost recovery.

MBB intends to offer more courses strictly for graduate students as faculty become available to teach them, but MBB graduate students will still enroll in appropriate 400/800 courses that provide sophisticated background work.

MBB shares the concern of the ERC about whether new teaching lab space in the Faculty of Science is really required. We think that efficient use of existing teaching lab space would provide sufficient space for all departments having wet teaching labs. Limiting access to lab courses should not be necessary, at least for MBB majors. See Appendix, Section 16 for an explanation of teaching lab use by MBB.

4. Proposed strategies for developing the DMBB graduate program, including possible diploma programs.

14. Recommendations: If a Handbook for Graduate Students in MBB exists, it should be advertised better; if not, it should be created. If there are SFU rules which constitute a default position for Departments which do not write their own rules, then those should be provided to each student on entry into the program and explicitly applied. Require each advisor to monitor and report on the progress of each student in an annual written report that discusses progress to date and goals for the future. This report would be provided to the student and all members of the research committee after each committee meeting. By the end of year 2 (M.Sc.) or year 4 (Ph.D.), the progress report would document agreed-upon goals for completion of the degree, and set a timetable for completion. Both goals and timetable would become more specific the closer a student gets to completion. The

time to degree in each laboratory should be public information, provided to a Graduate Education Committee and available to all prospective students. Research committees should be made aware of laboratories that deviate consistently from an optimal timescale, to provide extra aid for students who might find that their advisors have unusual expectations. Conversely, MBB should adopt rules governing the amount of time a student may ordinarily be supported during pursuit of a graduate degree. These rules should be designed to protect both students and faculty from unrealistic expectations, while taking into account unusual situations (childbirth, family emergencies, change of laboratory, etc.).

The proposed Diploma program had a very low profile within the Department. Many faculty seemed unaware of it, and essentially none considered it to be a high priority. Given the rapid growth of the Department, its need to consolidate a great deal of change, its present difficulties with graduate courses, and its priority for high-quality research, we do not consider that a Diploma program is consistent with the goals of the Department.

Response: MBB agrees with the sentiments of this recommendation, but notes that many of the comments are based on inaccurate or erroneous information. MBB has a handbook for graduate students (prepared with considerable help from the MBB Graduate Caucus). It is distributed to all new students, along with the SFU Graduate Handbook. Graduate students are provided with ample verbal feedback during and after their supervisory committee meetings that occur soon after their arrival and at least annually thereafter. Students always see the assessment forms filled out and signed by all members of the supervisory committee and can request clarification; they will now sign the form acknowledging having read the comments and can provide written commentary. Not all of this feedback is in written form unless there are serious concerns that must be addressed by the student or supervisor. MBB agrees that the written comments should be more explicit in some instances, and will encourage this improvement. As students near the end of their program (usually about a year in advance of the anticipated defense date), there is always a consideration of what needs to be completed prior to producing the thesis and a reasonable time frame. MBB 806 is also very useful in focusing on what constitutes a feasible Ph.D. thesis project having achievable goals.

By the standards of SFU and Canada, the Department has a good record with regard to time to completion of degree (especially for the Ph.D.: average completion time: 16.68 semesters), and especially the fraction of entering students who complete their degree programs. As noted in the SSD, MBB has already implemented mechanisms to reduce completion times for the M.Sc. (average completion time: 9.53), though it is too soon to assess their success. The times required for degree completion in individual labs can be obtained from the Graduate Secretary upon request by a student or applicant. This information will not be posted in a public place to protect privacy of students. While a few students have taken very long times to complete theses, an examination of the data on completion times provides no indication that some faculty members consistently require longer completion times, though the sample size of students is very small for

most faculty. The Chairs of the Department and the Graduate Studies Committee have never received a complaint from a graduate student that a faculty member is standing in the way of their completing a thesis, though members of the Graduate Caucus have been told that students should report such problems to the GSC or Dept Chair (or to the Dean of Graduate Studies).

MBB opposes imposition of arbitrary time limits for financial support of graduate students, preferring its present policy of providing full financial support for all students making acceptable progress (with warning following a meeting with the supervisory committee to those who may not be). Members of the Graduate Caucus also oppose imposing time limits for financial support of students. As explained in the SSD, the policy with regard to financial support of students is explicit and is rigorously enforced. The level of financial support received by students is somewhat variable due to differences in maximum stipends allowed by different agencies and variable levels of scholarship support, but *all* graduate students receive at least the departmental minimum stipend (the maximum yearly stipend allowed by NSERC), contrary to rumors among some graduate students. Unfortunately, NSERC has not sufficiently adjusted for the large increases in tuition at most Canadian Universities, including SFU, so many graduate students are worse off financially than they were a few years ago. The TSSU and Department have clear guidelines for assigning TAs. There is usually an insufficient number of applications from MBB graduate students, who have appointment priority. Graduate students will not be offered TAs in courses for which they are not properly qualified in the opinion of the course instructor.

The diploma program being considered by MBB is similar to the B.Sc./M.Sc. program proposed by the ERC. We agree that the M.Sc. credential is likely to be more appealing to students, but it should include a prominent research component. On the other hand, the diploma program might be more effective as a tool for recruiting students from other universities to the M.Sc./Ph.D. program. For now, MBB is not planning to implement a diploma program except for students in the Bioinformatics training program.

15. Recommendations: More small-enrollment, intensive graduate courses with enrollment restricted to graduate students! If a few honors undergraduates are admitted to these courses (e.g., in a BS/MS program), this would create a real incentive to teach. If these courses focus on primary literature and are taught by a team of faculty members, they would be fun for both faculty and students. Create a formal evaluation system for graduate teaching. Make evaluations public (not just numbers, but all comments fit to print), so that students may choose among courses based upon evaluation. Use teaching evaluations as at least one of the determinants for promotion and for recommendations for external recognition of faculty.

Response: As noted in its SSD, MBB agrees that a high priority should be to offer more courses strictly for graduate students (plus honors students, as proposed by ERC). As new faculty arrive and others assume full teaching duties such courses will increase in number. MBB is enthusiastic about the suggestion by the ERC that some graduate courses be team taught. The 800 level component of double numbered courses always has

distinctive features oriented toward graduate students. Some double numbered courses are already taught mostly or completely separately. MBB believes that the existing 4xx/8xx courses, most of which *are* focused on primary literature, serve graduate students well in providing sophisticated background course work recommended by their supervisory committees.

All MBB graduate courses are formally evaluated, except for the 3 student seminar courses (MBB 801/802/806), for which the standard evaluation forms are not appropriate. MBB will allow the Graduate Caucus to use an evaluation questionnaire it has designed for these courses, using the internet to avoid privacy issues related to written responses from a small group. Teaching evaluations provide useful feedback to course instructors, and are an important part of consideration for promotion and merit reviews. However, by agreement with the Dean of Science, these evaluations will not be distributed to students or posted because of privacy issues. We are confident that graduate students are aware of which courses and faculty are highly regarded without needing to publish evaluations. Members of the ERC also indicated they felt that too many course credits are required for the graduate degrees, but were informed this could not be changed by the Department. The MBB Graduate Studies Committee and Graduate Caucus have agreed to consider increasing the credit value of MBB 801 and 802 (the student seminar courses worth two credits) to better reflect the current work load for students and allow for inclusion of some topics related to professional education (this is being implemented this year).

16. Recommendations. There appeared to be no seminar committee charged with the seminar program, and organizing an excellent program is a huge responsibility to devolve upon a single faculty member. If there is reorganization of the committee structure in MBB, the seminar program should be added to the list. This committee could then ensure that seminars occur regularly, and institute a mechanism to ensure that all students can learn something from each seminar. Students suggested food as a lure. At some schools, there is a pre-seminar session at which graduate students and a local faculty member (often the host) meet to discuss one or two important papers from the speaker's laboratory. This brings students to a level where they can understand enough so that going to a seminar is worthwhile. The pre-seminar program could be constructed as a course with credit for attendance.

Response: MBB agrees that the seminar program has recently not been as active as in the past and should be improved. Coffee, tea, and cookies are already provided prior to seminars. Speakers are asked to speak to a mixed audience of molecular biology and biochemistry faculty and graduate students; most speakers comply in an effective way. Graduate students in the program are expected to have, or quickly obtain, the sufficient breadth of background to understand and appreciate the full range of departmental seminars, at least in large measure. MBB 801 and 802 are designed to facilitate this, as does the use of 4xx/8xx courses recommended by the Supervisory Committee to rectify deficiencies in breadth of course work. As stated in the Calendar, all MBB graduate students are expected to attend all departmental seminars.

An MBB Seminar Committee, having a graduate representative, has been created. A seminar course like that proposed, including a writing component, was offered in the past, but was replaced with the student seminar courses (MBB 801, 802), requiring a broader range of student activity and involvement. It may be possible to combine the best elements of both approaches. The Graduate Caucus will continue to be encouraged to invite and host seminar speakers using funds provided by the Department.

17. Recommendations. Clarify procedures. Adding students to Departmental email lists may be one simple mechanism to improve the lines of communication. In addition, there should be more inclusion of graduate students in planning and decision-making, particularly in areas that affect them directly such as courses, curriculum, and requirements for students. This participation will enhance their ability to function effectively when they themselves become faculty members.

Response: Written procedures are in place and are already quite clear for normal graduate student issues (preparing for an external review is not a normal issue). Graduate, undergraduate, and Department-wide email lists exist and are used for communications. Graduate students were informed about the external review well in advance of the visit of the ERC (by email to the Caucus and at the annual departmental colloquium), but many remained unaware of it until a few days before it took place. The Caucus then did a very useful survey of graduate student opinion. Unfortunately, the Department did not have an opportunity to see and respond to the results prior to the visit of the ERC. The departmental administration will attempt to be more pro-active in seeking a graduate student response on issues of common concern. It already communicates with the MBB Graduate Caucus on issues related to graduate students, and regular (once a semester) meetings between the caucus and Graduate Studies Committee are now planned. A graduate representative of the Caucus is a member of the MBB Graduate Studies Committee, and is involved as a full voting member in all of its activities: acceptance of students, ranking of scholarship applicants, and policy and curriculum issues. A graduate student serves on all MBB faculty search committees and has full voting rights (a reversal of a policy implemented last year, but this remains a controversial issue among faculty). All job candidates meet with the members of the Graduate Caucus, which provides written input to the search committee on the candidates. The graduate representatives on committees are expected to liaise between the caucus and the faculty and can request meetings between the departmental faculty and the caucus when desired. In comparison with many on other departments at SFU and elsewhere, we are confident that MBB graduate students already have an unusually high level of opportunity for involvement in departmental affairs and planning for its future. Many students do not take advantage of this opportunity, but fortunately some do in a very effective way.

5. Strategies for the Department to engage in cooperative research and teaching programs with the new Faculty of Health Sciences.

18. Recommendations: DMBB already faces numerous organizational and structural challenges consequent to its rapid growth and to its transition from an Institute into a

Department. At this time, another major reorganization or realignment involving DMBB and a new Faculty would appear to us to be ill advised. However, the Faculty of Health Sciences potentially will provide many new opportunities for individual DMBB researchers to establish research and teaching links, and DMBB will provide the Faculty with a proximate, dynamic group of biomedical scientists that will help enable its recruiting and program development activities.

Response: MBB plans to take a wait-and-see approach to its role in the new Faculty of Health Sciences, except for hiring of two new faculty members related to Jamie Scott's CRC Tier I position. If FHS were to commit to developing a strong program in biomedical research and teaching, there would be substantial interest in MBB in moving to that Faculty. MBB faculty do not believe the Department "faces numerous organizational and structural challenges" besides those of a rapidly growing new Department having inadequate hard money resources and space to sustain its current and future operations.

B. "Other areas to be considered"

2. Faculty.

3. Administration.

19. Recommendation: Clear lines of command need to be established within the Department, and substantial delegation of responsibilities from the Chair to the Departmental Administrator, and to faculty committees, needs to be achieved. Faculty committees, at least for important matters such as graduate training, curriculum development and review, and technical/space resource allocation, need to be provided with a real role in Departmental governance. Communication has to be improved so that all Departmental stakeholders (students, staff, teaching, tenure-track, and tenured faculty) know what is going on, and feel that they have a say.

Response: The Department already has very active and effective committees for curriculum development, graduate training, and promotion/tenure. The committees bring motions to MBB faculty meetings for debate and approval. MBB creates *ad hoc* committees for hiring and temporary issues such as space allocation. For example, a major reallocation of space within the Department was done last year, and space will continue to be reallocated from time to time based on changing needs. The Department is creating a Research and Resources Committee to plan and supervise research technical services, acquisition and use of equipment and facilities, and to consider hiring priorities for faculty and staff. Though he would like to have a reduced workload, the Chair of MBB will resist delegating responsibilities for supervision of technical/administrative staff to anyone lacking appropriate expertise. MBB does not at this time propose to convert the position of Departmental Assistant to Departmental Administrator or create a Laboratory Coordinator position having expertise and authority to supervise technical staff.

MBB challenges the implication that there are poor communications within the Department, which is generally open and operates mostly by consensus. We are certain that the ERC encountered mostly happy faculty, students, and staff proud of the Department and united in their main concerns about the future of the Department. Faculty, students, and staff who met with the ERC were concerned about its lines of questioning and commentary, which often did not seem to be focused on the major issues of concern to the Department. In some cases the focus appeared to be on issues more specific to other institutions.

5. Future Directions.

"DMBB is a strong Department. As the new faculty members gain experience and their programs mature, it is likely to continue to improve and gain stature. DMBB has the clear potential to be one of the top two or three Faculty of Science-based molecular biology units in Canada.

We believe the challenges this Department faces can be overcome, and we have made several recommendations in the material above which suggest future directions the Department may wish to consider, and which we intend to be constructive in helping the Department to achieve its full potential."

Response: We agree with the overall assessment, except that we believe MBB is already among the top 2 or 3 departments in Canada, especially among those doing biochemistry as well as molecular biology. MBB has found the exercise and the report of the ERC to be useful and will adopt the spirit of most of the recommendations with enthusiasm. We hope that the higher administration will move quickly and decisively as well.

Appendix:

Response to other comments (quoted in sequence from the ERC's report):

1. Because they hold salary awards "a significant proportion of the faculty members consider themselves to be essentially "research faculty". On one hand, this is a very positive development in that it allows new Faculty members to establish solid research careers. On the other hand, however, it reduces the involvement of these faculty members in other aspects of Departmental life, and has created some tensions between (mostly) more senior staff who lack salary awards and more junior staff who have them. There does not seem to be a clear vision of how the faculty members with salary awards will integrate into the teaching and administrative life of the Department once their awards have expired."

Response. The presence of several MBB faculty holding salary awards and having reduced teaching roles has created some serious problems for managing the Department's teaching program. However, these faculty members take their remaining teaching roles very seriously, sometimes volunteering to do more than is required of them. In most cases, they are teaching courses having large enrollments placing substantial burdens on

their time. The supposed tensions have not surfaced in the Department, which has been careful not to overload other faculty because of the reduced duties of those holding salary awards. All faculty in the Department recognize that the recovered salary income has been used in ways that benefit the entire Department, not just the faculty holding salary awards (as often happens elsewhere): salary support for clerical and technical support staff, bridging new faculty to retirements, and support for seminars, equipment acquisition and maintenance. In most instances, we do not know for sure when the (mostly renewable) faculty fellowships will end, but all of the faculty holding salary awards will ultimately assume full teaching responsibilities, allowing for an increase in numbers and frequencies of course offerings. Counteracting this will be the departure of Faculty to whom appointments have been bridged (Smith, Baillie, and Brandhorst).

2. "This raises a concern about having a two-tier faculty system. It is not clear that the goals of these faculty harmonize with those of the researchers. Preferably, university teaching and research activities cross-fertilize one another. As DMBB has evolved a system that includes a large number of specialists in either teaching or research, this type of cross-fertilization is minimal."

Response: As noted before, MBB has very few "teaching" faculty (Lecturers) in comparison with other departments at SFU and in Canada, and they are mainly temporary, paid with faculty salary recovery funds. The Lecturers are well integrated into the life of the Department, and all faculty members have important teaching and service roles.

3. "While in the case of DMBB a vibrant new entity resulted, in general, we think that the fluidity of Department affiliation contributes to instability in all Departments and fuels interdepartmental rivalries."

Response: DMBB does not promote faculty jumping ship to other departments. However, we believe that a rational realignment of life scientists at SFU is desirable and overdue. The creation of the Faculty of Health Sciences may lead to that realignment. The overall success of MBB is illustrative of the gains that can follow realignment of faculty.

4. "The technicians for the teaching labs noted that their greatest difficulty was in scheduling their time, especially when the large undergraduate labs are running concurrently. They often have to work long hours, and we were uncertain whether their scheduling and compensation arrangements are in consonance with relevant collective bargaining agreements. If they are not, this is a matter that requires urgent resolution."

Response. The main problem for teaching technicians has been the non-uniformity of their work load due to the uneven availability of teaching lab space during the year. Although extra TA help was hired this past semester (04-2) to address this issue, considerable overtime was still generated by one of the teaching technicians (who will be compensated in accord with collective agreements). MBB considers this arrangement to be a poor use of resources, but it is necessary when morning lab sections are offered. In

the slow period during the Fall (when MBB has had only its single teaching lab available), the technicians do some advanced preparation of materials to be used in MBB 432 over the next two semesters, and take time off in compensation for overtime accrued. MBB prefers to spread its lab course teaching more evenly over three semesters, better serving the students and technical staff. Based on a recent but temporary agreement to share teaching lab space with Biosciences in all three semesters, the work loads for the teaching technicians will be more uniform during the year and more students will be accommodated, including Biosciences majors wanting to enroll in MBB 308.

5. "Looking to the future, one can imagine that there may be less work in the area of computer set-up but that virtually all research equipment will involve some sophisticated microelectronics. Based on this, the University might consider creating a single regular technical staff position to service all of the Departmental equipment."

Response. The computer/instrumentation consultant's job description already includes responsibilities for some types of sophisticated equipment and the incumbent has become very involved in the operation of the new X-ray diffraction facility. The role of computation in the Life Sciences is expanding rapidly and is becoming more complex, requiring the on-going support provided by this essential position. The consultant is keeping very busy with his defined roles and does not have time to assume more roles. His role is certainly not confined to setting up and maintaining departmental computers.

There remains a need for another crucial research support role: looking after autoclaves, dishwashers, centrifuges, film developer, gel documentation system, spectrophotometers, fluorimeters, phosphorimagers, French Press, water polishers, etc., and providing instruction in the effective and safe use of basic equipment used by many researchers in MBB and the other departments and schools of SFU.

6. "The level of administrative staff appears to be adequate, but its effectiveness suffers from poorly-defined duties and unclear lines of supervision. One of the administrators is also a part-time faculty member responsible for one of the teaching labs; this seems to be an excessive and perhaps conflicting set of responsibilities. This individual also seems to assume extensive student counseling duties that lie beyond the responsibility of the Department."

Response: The Advisor/Program Coordinator in question teaches some lecture courses, not lab courses, though she was previously involved in developing the content of two of the lab courses. These are independent half-time positions filled by one highly dedicated and qualified individual who needs a full time income. She does not perform the role of a counselor. All of the Administrative/Professional (APSA) staff have recent job descriptions that are an accurate representation of what they do and to whom they report; these descriptions were written in consultation with the staff members. The same applies to CUPE staff.

7. "Research space: In general the research space is adequate, and the researchers appear to be reasonably content with it. More space will need to be made available, however, to cope with future expansion of the faculty. New space seems to be found on an ad hoc basis when new positions become available to the Department. A longer-term plan would relieve anxiety and improve the effectiveness of Departmental recruiting."

Response: MBB agrees that new space will need to be found to cope with its almost certain growth in response to student demand and research opportunities. These pressures are likely to continue to be stronger in MBB than in most other departments of the Faculty. MBB also agrees with the assessment that space in the Faculty of Science is found and allocated on an *ad hoc* basis (even when new space is being created, such as in TASC 2). MBB agrees that the Faculty of Science (and SFU) should have a longer term plan and transparent mechanisms to allocate and reallocate space (and faculty positions) among departments as needs and opportunities change.

MBB performed an analysis of its research space utilization, and carried out an extensive reallocation of its research space last year, including a plan for the known number of new faculty recruits. Unless its research activities and numbers of active researchers (students, postdocs, technicians, faculty, etc) declines it will require more research space. Within a growing Department having a fixed amount of space, planning is always in a sense reactive, since levels of research activity vary and change with time for individual faculty and unanticipated new opportunities arise. The Department cannot simply provide more space to any researcher wanting to expand operations (even if capable of generating the salary support via grants and contracts), but it does try to respond sensibly to different and changing levels of research activity. While there will continue to be reallocation of research lab space within MBB from time to time, the Department will certainly need new lab space if it hires new faculty planning to do wet lab research. The ERC explicitly acknowledged this in its report and expects the Department to expand at a moderate rate. MBB agrees, though it expects enrollment pressures to continue to increase. MBB will create a Research and Resources Committee to facilitate planning for expansion, identifying hiring priorities and attendant space requirements.

8. "The Review Committee felt that an inordinate amount of energy was being devoted to arguments about teaching space."

Response: This is an issue of grave concern and frustration for MBB because the associated uncertainty threatens our capacity to accommodate the numbers of students admitted as majors. In accepting these students the Department made a tacit agreement to accommodate their course work requirements. It anticipated that the Faculty of Science would quickly make appropriate adjustments of space allocation after the Department documented its needs (as proposed by the previous Dean), but this has not happened. The teaching space issue has been resolved on a temporary basis without causing undue hardship to Biosciences. The issue undoubtedly came up many times in front of the ERC because it is a frustrating example of the failure of the Faculty of Science to insure that MBB has an equitable allocation of resources required to meet its

obligations to its majors. However, it is not an issue over which considerable time has been spent in the Faculty or the Department, though it tends to impact negatively on otherwise harmonious relations between MBB and Biosciences. An issue facing both Departments concerns how to renovate space reassigned for new uses and the need for new space to accommodate anticipated growth in enrollments requiring more faculty.

9. "Administrative space: The administrative space appears to quite limited - although no complaints were voiced in this regard. Again, an objective space audit would identify any possible problems in this area."

Response: The SSD pointed out that a secure work space is required for the Chair's secretary and there is an inadequacy of meeting room space (precluding conversion of the small meeting room SSB 8178 to this use). But DMBB considers its most pressing space issues to be the long term provision of adequate teaching lab space, offices for its new faculty, and research space for future expansion.

10. "While the Department's recent recruiting has been superb, we do not think it is feasible or advisable for it to continue growing at the same rapid pace in the next few years, although a small number of additional hires may be justified."

Response: MBB is pleased with the assessment of its recruitment efforts and would like them to continue. MBB is not interested in undergoing rapid growth. Its recent "growth" is somewhat illusory because it involved replacing departed faculty, bridging to future retirements, and temporary replacement of faculty holding salary awards. Growth of the faculty complement will need to continue at least slowly in order to accommodate anticipated increases in demand for enrollment in MBB courses and mandated expansion of enrollment of the Faculty. If faculty growth does not occur with appropriate allocation of resources, MBB will need to implement a more selective system for admitting students into its majors programs and courses. Having more faculty members would allow MBB to more effectively implement the recommendations of the ERC that more upper division and graduate courses be offered.

There is much interest among MBB faculty in having highly selective majors programs, but that may not be the appropriate priority for the Faculty or University. The ERC seemed sympathetic to this approach. Based on experience in other departments/schools at SFU, selectivity seems likely to increase demand for entrance.

11. "*The overall quality of the undergraduate program is excellent.* The undergraduates we spoke to seemed content with most aspects of the coursework and interactions with the faculty and department. ... The numbers of majors is high, but seems to have leveled off. To accommodate the numbers of students without adding courses or course sections, many classes are large. Nonetheless, most students (at least through the third year) are being served reasonably well at the current time, despite the large class size."

Response: We appreciate the positive assessment of the quality of the undergraduate program. It is premature to conclude that demand for entry into the majors programs has

leveled off. As noted in the SSD, the Department recently raised its GPA requirements (to 2.50) for admittance into the majors program and has imposed other filters. It will continue to make adjustments based on projected availability of resources, teaching lab space in particular. MBB would prefer to be offering more upper division courses to help reduce the problem of high enrollments. This could be facilitated by using more of the faculty salary recoveries to hire more limited term teaching faculty to teach lower division courses, rather than continuing to use the funds to pay for clerical and technical services that should be provided through base budgeted salaries as in other departments of the Faculty.

12. "Because of the quality and accomplishments of its faculty, MBB should be the perfect home for this sort of undergraduate [those planning independent careers in science]. Training these students becomes particularly important in year four, when they typically seek challenging courses and interesting and independent laboratory research, distinct from large teaching laboratories with set protocols. However, there are relatively few fourth year course offerings, and many have very large enrollments."

Response: (See also the previous response to 11). Many MBB majors find opportunities to do independent studies and get research experience, but they would surely benefit from having more 400 level courses with smaller enrollments. The same issue applies to graduate students. MBB believes that its faculty complement should be increased to reflect the fact that it has far more declared majors per faculty member (by 2-10x) than other departments in the Faculty. MBB faculty members supervise many independent studies and research courses. We believe that more faculty and resources per FTE are required to handle the upper division teaching in a Department having so many majors and graduate students. The situation for course offerings is obviously exacerbated by the many MBB faculty having reduced teaching loads, since it is difficult or impossible to replace their upper division/graduate teaching roles.

13. "The increase in numbers of faculty has not been accompanied by a proportional increase in the amount of teaching done by the Department, even when the high numbers of teaching buyouts are taken into account. The scope of the course offerings is reasonable, but could be expanded with the additional faculty on board."

Response: This false conclusion was based on some erroneous data provided by Analytical Studies to the ERC for the early years of MBB. The correct raw data was included in the SSD, showing the teaching roles of every MBB faculty member since before the Department began. The correct data were then summarized in writing for the ERC near the end of its visit, but were ignored. In 98/99 there were 13 tenure track faculty members in MBB (counting as ½ Thewalt and Brandhorst who held joint appointments and taught primarily in other departments) and one instructor/lecturer. In 02/03 there were 18 tenure track faculty members and one Lecturer (as well as 1.5 lecturers hired with soft funds as teaching replacements). During that period, the total number of MBB courses taught per faculty member *increased* by 9%. This increase was in spite of the many faculty holding salary awards, the reduced teaching loads for new faculty in their first year (three in 02/03), the absence of any teaching duties for former

Dean of Science Davidson, the half-time teaching role for the new Chair of the Department (previously not available to the Director of IMBB), the half teaching buyout for Brandhorst in his role as Associate Director of IHRE, study leaves, and teaching reductions to allow time for development of the new lab courses.

During this period the number of MBB FTEs and majors increased dramatically, with MBB faculty now handling more weighted FTEs per capita than any other laboratory science department in the Faculty (see Table 3.5 in the SSD). Thus, the teaching workload for MBB faculty increased substantially during this period. To date, as documented in the SSD, there has been little adjustment to the MBB base budget as a consequence of the greatly increased numbers of students and attendant operating costs. As more MBB faculty join the Department as scheduled, or become available for full time teaching, the numbers of MBB courses taught per year will increase, hopefully accompanied by declines in enrollment per course (provided enrollment pressures to do not continue to increase).

14. "Many courses are large, and include both undergrads and graduate students despite their different educational needs."

Response. It is common at other institutions to allow 400 level (advanced undergraduate) courses to be used for credit toward a graduate degree when deemed appropriate by the supervisory committee. This is effectively impossible at SFU, so double numbered (4xx/8xx) courses have arisen at SFU with various degrees of differentiation. We do not believe that graduate students are badly served by these courses when recommended by their supervisory committees, but strongly agree that there should be more courses that are designed for grad students. In this Response, MBB has suggested mechanisms for helping to achieve this. [Note: in a recent poll, MBB graduate students consider themselves badly served by these 4xx/8xx courses, though they rate most such courses very favorably when taking them].

15. "There was relatively little faculty "ownership" of courses evident, and a strong teaching culture was not being developed among most junior faculty. This was blamed on the numbers of buyouts, but this does not fully explain either the quantity of teaching, or the attitude toward teaching. In the long run, the lack of commitment to teaching may present a real threat to the mission of SFU."

Response: MBB takes considerable exception to these statements, for which no documentation was provided. Moreover, this issue was not discussed by the ERC with the Undergraduate Curriculum Committee nor with the MBB Chair. If the charge were true it would seem to contradict the assessment by the ERC of the teaching program as "excellent", one that the students like. Each faculty member is fully responsible for at least one upper division course that in most instances he/she either created or extensively revised; they feel a strong sense of "ownership" for these courses, which usually garner high praise in student evaluations. There is less sense of ownership for the core courses taught by various faculty two or three times per year, but we doubt that using the

suggested team teaching approach to these courses would increase the sense of ownership (on the contrary). The 'junior faculty' have made the quality of their teaching a priority and recognize that the Department is attracting many students because of the perceived quality of its teaching programs (and the students it attracts), as well as interest in the subject matter. Student evaluations indicate that nearly all of the faculty, the newer faculty and those holding salary awards in particular, go about their teaching in a thoughtful, enthusiastic, and responsible way, in spite of the frustrations of large enrollments and a broad range of student quality and engagement. MBB faculty do indeed attract many undergraduates and graduate students into their labs based on the appeal of the courses they teach.

In terms of quantity of teaching, the MBB FTE per CFL load is similar to, or higher than, other science departments at SFU and many other Canadian universities. The numbers of courses and students taught per faculty member is in accord with disciplinary norms. But the teaching load is much heavier than in departments of molecular biology and biochemistry based in medical schools, which represent the main competition for grants. Moreover, most MBB faculty teach large numbers of independent studies, independent research, and directed readings courses as "overload". They do not even receive departmental grants to partially cover lab supplies for such courses, so research grants are effectively subsidizing the undergraduate teaching program. All of this "voluntary" teaching activity is indicative of a strong commitment to teaching quality and a desire to provide a good research experience to motivated students, who respond favorably.

16. "There were many discussions of the need for more teaching space and new teaching space. However, the reviewers just did not perceive this as a real problem. The walk-through showed that the undergraduate laboratory space is absolutely superb. The numbers of students accommodated per session seemed low. There seemed to have been little attempt to get "out-of-the-box" to find solutions to issues presented to the reviewers as major and intractable problems. One simple example. Apparently, despite the advertised space crunch, labs are given only on Tuesday, Wednesday and Thursday. This leaves Monday for prep time, which is realistic; but there was no good rationale for not teaching labs on Friday, even recognizing that this might mean a TA would need to come in on the weekend to remove plates from an incubator or finish up other details of an experiment."

Response: The ERC is quite wrong in its assessment that allocation of teaching lab space is not real problem. It failed to get the facts on which to base a conclusion. The availability of "borrowed" space is the primary determinant of the frequency of weekly lab sections. MBB 309 is taught twice per year on 4 or 5 days of the week in the MBB teaching lab. That means the room is available in only one semester for the other two laboratory courses, MBB 308 and 432, which are also effectively required of all majors and also taught twice a year. MBB 308 and 432 also have large enrollments, though more students can be accommodated per section in these courses, reducing the number of sections required. There is also unmet demand for entry into these courses, especially MBB 308, by students from other departments, notably Biosciences. MBB 308 and 432

had eleven sections in space "borrowed" from Biosciences in the 2003-4 academic year, yet turned away students. The only way for each of the MBB lab courses to be taught twice per year is to "borrow" teaching lab space (and some equipment), but MBB has only year-to-year assurances of access to borrowed space, making planning precarious. The borrowed lab was available only three days per week in the Spring, 2004, when demand was highest.

The nature of the exercises and enrollment demands vs. section sizes are other issues. MBB 432 requires substantial setup for each exercise and requires students to perform operations on the next day, making Friday labs impractical without hiring extra staff to supervise the students on Saturdays. Similar issues with regard to MBB 308 are being rectified by attempting to modify the exercises. MBB 309 does not require students to do work in the lab the next day, so it is taught 5 days per week when the demand is there.

MBB must be able to run at least two lab courses each semester four or five days a week to accommodate the enrollment demands of its majors and other students, and it cannot do that with the one teaching lab under its control, especially one designed for biochemistry rather than molecular biology (i.e., having lots of fume hoods reducing useful bench space). To make more efficient use of the space available, we have experimented with offering lab sections in the morning (including two in 04-2), but most students have conflicts with other courses and this approach results in an extremely long work day for the teaching technicians and lab instructors dealing with two labs each day.

The number of students accommodated per lab section depends on the nature of the course and has already been substantially increased to a practical maximum related to amount of appropriate bench space and equipment. The only way to increase throughput per session would be to increase the size of working groups. We have tried that (using groups of three instead of pairs), but the quality of the hands-on experience was undermined. The *quality* of the space has never been an issue (except for lack of some limiting equipment), nor has MBB made any demand for the creation of *new* teaching lab space. We are confident that there is sufficient teaching lab space of good quality in SSB for all MBB and Biosciences upper division teaching on the SFU main campus in the foreseeable future. As documented in the SSD, MBB is considerably more efficient in its use of teaching lab space than is Biosciences, so the criticism by the ERC seems misdirected.

Had the ERC asked the appropriate questions they would have discovered that MBB has already done considerable thinking "out of the box" about its lab courses, as well as a doing a huge amount of development of these courses so that they integrate with its curriculum, rather than buying canned lab exercises. The goal of MBB in its lab courses is to teach a range of currently useful technical skills, experimental design, data analysis, and proper reporting of experimental results, while conveying a sense of how contemporary research is actually performed. MBB does not want its lab courses to become "Mickey Mouse" demonstration labs or optional courses that have become common elsewhere to save money and space while shortchanging students.

During its planning of these new lab courses, MBB did not anticipate having such high enrollment demands from unanticipated numbers of majors and students from other departments. But we always knew and always stated that more than the single teaching lab would be required in order to mount MBB 432, which effectively replaced BISC 431(now defunct) that had been taught by faculty transferring to MBB. Even without MBB 432, the single biochemistry teaching lab cannot accommodate the large increase in numbers of majors who must take MBB 308 and 309. MBB expected that teaching lab space and other resources would be transferred along with the transfer of faculty into the new Department, but that has not yet happened. It must happen now.

We regard the high demand for enrollment in MBB courses as a sign of the success of our programs, and we believe it is due in large measure to the quality of our courses, especially our lab courses, as well as the excitement of our disciplines and the virtues of our faculty members. MBB will strive to maintain and improve that quality, but we require the essential resources to do so.

Summary

MBB believes that expeditious action is required concerning the hard funding of salaries for core clerical and technical support services for the department that now depend on soft money. Faculty salary recoveries should be used primarily for replacement of their teaching function. This would help alleviate a major problem identified in the SSD and emphasized by the ERC: the large enrollments in 400 level courses and paucity of courses strictly for graduate students. Hiring priorities and resource allocation in the Faculty of Science should be consider the unique situation faced by MBB in having the largest numbers of majors in the Faculty while teaching no first year courses. MBB strongly endorses the recommendation to perform an inventory of space utilization in the Faculty of Science (preferably including Applied Sciences). We hope that this would result in equitable reallocation of research and teaching laboratories and offices based on current requirements rather than past history. MBB must be able to plan with confidence that its large and increasing number of majors can be accommodated in their required course work, particularly in the laboratory courses that are considered by faculty and students alike to be a fundamental part of the MBB program considered to by the ERC to be of high quality.

Dean's Comments
External Review of the Department of Molecular Biology and
Biochemistry
October 12, 2004

I have in hand the report of the external review committee on the Department of Molecular Biology and Biochemistry (MBB) as well as the response of the Department, dated September 25, 2004. I note in passing that the Departmental response is more than twice as long as the review committee's report and will attempt to keep my own comments somewhat more limited.

During the course of two face-to-face meetings with the external review committee (ERC) I formed the opinion that they had a good grasp of the Department's activities and, perhaps equally important, of the general atmosphere in the Department. Since the Department itself suggested the composition of the ERC one must assume that the members of the committee had the confidence of the Department. It is therefore remarkable and somewhat discouraging to read the rather negative departmental response.

Below I will comment on some of the recommendations and the departmental response.

1. **Recommendation:** The senior administration and the Department should develop a written transition plan to deal with the issue of salary grant expiration and provide for permanent funding of the Department's central activities. Conclusion of a satisfactory agreement would go a long way toward alleviating present concerns.

The ERC did not define what it meant by "central activities". I have taken it to mean the office support staff and have assured the Department that their salaries will be transferred to the base budget in fiscal year 2005/06.

2. **Recommendation:** All courses should benefit from at least some involvement from faculty with active research programs. More use of team-teaching (see below) would allow this recommendation to be implemented without compromising the constraints of the salary grant programs, and would enable better integration of grant holders into the pedagogical activities of the Department.

The Department disagrees with the perception of the ERC that at least some of the Faculty on external salary awards are not sufficiently committed to the undergraduate program. I have no independent information on this point and cannot comment.

3. **Recommendation:** A committee of tenure-track and tenured faculty should be formed to work with the teaching faculty to carefully examine the content of the laboratory courses with the goal of reducing the duration of the laboratories. Our impression was that this could be accomplished without compromising course quality, perhaps by more utilization of commercially prepared reagents, etc.

The ERC concluded, *inter alia*, that MBB requires more undergraduate laboratory work than comparable programs elsewhere in Canada and the US and asked that the Department consider reducing this requirement. The Department declines to do so.

4. **Recommendation:** The Departmental Administrator needs to be placed clearly in charge of the time management of the technical staff. She must ensure that collective agreements are respected and the workload of support staff remains manageable.

The administrative model recommended by the ERC is in effect in, e.g., Physics and seems to work quite well in that Department. However, if the Chair of MBB wishes to continue to directly supervise the technical staff, he has that option.

5. **Recommendation:** "The university might consider creating a single regular technical staff position to service all of the Departmental equipment." A technical services committee, consisting of several faculty members and the Departmental Administrator, should be formed to define the duties of Departmental research support staff and to devise a system for equitable management of their time. Consideration should be given to instituting at least a partial cost-recovery system for these services.

This office will carefully consider a request for additional technical support. It may be possible to find an individual capable of maintaining departmental facilities and looking after the Department's computer needs.

6. **Recommendation:** At present, the equipment maintenance technician is a graduate student, who performs the technical task part-time. This is an inappropriate job for a graduate student, and the student's progress through the program is clearly being negatively impacted by holding this job. Technicians and graduate students have very different duties and responsibilities, and the same person cannot hold both positions.

I don't anticipate that it will be necessary to hire graduate students as part-time technicians in the future. However, in this instance I agree with the Department's response.

7. **Recommendation:** Ensure that administrative staff positions are base-funded through the long-term Department funding agreement recommended above.

This recommendation has been accepted as far as the secretarial staff is concerned. With regard to the computer systems/instrumentation consultant, I note that at least four departments (Earth Sciences, Mathematics, Physics and Statistics and Actuarial Sciences) in the Faculty of Science do not have a base-funded APSA position of this kind. If the Department wishes to add this individual to its base-funded complement, it is free to convert a future CFL position.

I note also that there is no mention in the response of the two instrumentation consultants hired by the Faculty of Health Sciences and made available, according to the Dean of that Faculty, to researchers in MBB. My sense is that the opening statement of the ERC report which reads, in part, "... DMBB is a well-resourced Department" is quite accurate.

8. **Recommendation:** Eliminate overlap between administrative and academic positions, and ensure that the administrative positions have clearly-defined duties and fall under the supervision of the Departmental Administrator.

I agree with the Department's response that it is not necessary for the undergraduate advisor to report to the Departmental Assistant.

9. **Recommendation:** The teaching labs are the focus of one of a number of long-standing disputes between DMBB and Biological Sciences, and to a lesser extent Chemistry. These disputes appear to us to be rooted in the history of the Departmental splits that led to the creation of DMBB, and are fueled by interpersonal rivalries. Our estimation is that both Departments contribute to this problem, and also that they are unable to resolve it among themselves. We propose that the Faculty of Science commission an independent space audit to examine research and teaching space utilization in Biological Sciences, DMBB, and Chemistry, and make binding recommendations as to how the available space might be better utilized.

There is, indeed, considerable friction between MBB and Biological Sciences over the use and "ownership" of certain teaching laboratories as well as, more recently, some high-quality research space. In a period of overall shortage of space, it is unlikely that all units will be satisfied all the time. Recently, a meeting between the two Chairs and myself resulted in an agreement for use of space that will see us through the period until the next significant building opens.

The Department's suggestion that an internal committee to evaluate space allocation be struck is a reasonable one and we will strike such a committee once some preliminary data have been assembled. I did explore the possibility of hiring an outside consultant but that proved to be prohibitively expensive.

10. **Recommendation:** The most serious problem in the faculty that could be addressed by recruitment is the lack of mid-career professors; there is an extremely biphasic age distribution within the Department. This also leads to concerns about the Department's ability to find people to assume leadership positions in the short to intermediate term. In addition to considering specific research specialties for new faculty positions, the Department might also consider hiring a productive, mid-career scientist with leadership ability, perhaps through a Tier I CRC. This would help to bridge the gap between junior and senior faculty within the Department.

As mentioned in the Department's response, the situation has been somewhat improved with the transfer of Associate Professor Lynne Quarmby from Biosciences to MBB and I have also approved a search for a bioinformatics faculty member at the Associate Professor level.

11. **Recommendation:** There does appear to be the need for additional secretarial/advisory support for the majors. It is important to recognize that the role of the Department in this capacity must be distinct from that of student advisory and counseling services that are better handled by at the University or Faculty level. Non-tenure track faculty may be devoting too much effort to advising.

I am not familiar enough with the day-to-day operations of the advisor to comment.

12. **Recommendation:** Establish a combined BS/MS program that would allow honors undergraduates to take courses that are specially designed for and largely restricted to graduate students (in contrast to the current 400/800 courses, which are large and attempt to teach both groups). This would provide an excellent training opportunity for students; and it would also provide faculty with an incentive to teach excellent graduate courses, in the hope of enticing these students to work in their laboratories. This combined program could include an opportunity for laboratory rotations in year five.

I agree that graduate students are almost inevitably short-changed by combined 400/800 courses and that there should be 800 level courses specifically intended for graduate students. In some of the better North American universities, it is not unusual for some of the stronger undergraduates to take graduate courses for credit but it is made clear to them that there will be no compromises in the course content. I think that this could work well here.

13. **Recommendations.** Within MBB, the numbers of laboratory courses required and their content need to be carefully re-examined. Can laboratory course requirements be better-tailored to individual students? Can the experimental design be modified so that labs do not require so many teaching hours, and finish on time? Most institutions just do not provide the level or extent of laboratory instruction found in MBB. Comparison with peer institutions could provide a useful guide for realistic changes in the curriculum. It might also be necessary to set the bar higher for admission to the laboratory, or to the major. In addition, MBB should consider separating their 400-level courses from graduate offerings, ideally by offering new courses for graduate students and honors undergraduates.

MBB and Biological Sciences need to work together to develop second- and third-year courses in which faculty members from both Departments **share** teaching, and to work out some short-term plan for use of teaching laboratory space. It is likely that the administration will need to guide or mediate this planning. In the long run, it would be very appropriate for SFU to examine the question of whether more teaching space is necessary or useful, or whether existing space might be adequate if used realistically by all Departments involved. This might best be done by employing an external consultant to examine current space use.

I support this recommendation. Unfortunately, the Department seems to be unwilling to consider changes to its program.

14. **Recommendations:** If a Handbook for Graduate Students in MBB exists, it should be advertised better; if not, it should be created. If there are SFU rules which constitute a default position for Departments which do not write their own rules, then those should be provided to each student on entry into the program and explicitly applied. Require each advisor to monitor and report on the progress of each student in an annual written report that discusses progress to date and goals for the future. This report would be provided to the student and all members of the research committee after each committee meeting. By the end of year 2 (M.Sc.) or year 4 (Ph.D.), the progress report would document agreed-upon goals for completion of the degree, and set a timetable for completion. Both goals and timetable would become more specific the closer a student gets to completion. The time to degree in each laboratory should be public information, provided to a Graduate Education Committee and available to all prospective students. Research committees should be made aware of laboratories that deviate consistently from an optimal timescale, to provide extra aid for students who might find that their advisors have unusual expectations. Conversely, MBB should adopt rules governing the amount of time a student may ordinarily be supported during pursuit of a graduate degree. These rules should be designed to protect both students and faculty from unrealistic expectations, while taking into account unusual situations (childbirth, family emergencies, change of laboratory, etc.).

The proposed Diploma program had a very low profile within the Department. Many faculty seemed unaware of it, and essentially none considered it to be a high priority. Given the rapid growth of the Department, its need to consolidate a great deal of change, its present difficulties with graduate courses, and its priority for high-quality research, we do not consider that a Diploma program is consistent with the goals of the Department.

The Department's response is adequate.

15. **Recommendations:** More small-enrollment, intensive graduate courses with enrollment restricted to graduate students! If a few honors undergraduates are admitted to these courses (e.g., in a BS/MS program), this would create a real incentive to teach. If these courses focus on primary literature and are taught by a team of faculty members, they would be fun for both faculty and students. Create a formal evaluation system for graduate teaching. Make evaluations public (not just numbers, but all comments fit to print), so that students may choose among courses based upon evaluation. Use teaching evaluations as at least one of the determinants for promotion and for recommendations for external recognition of faculty.

I agree with the recommendations of the ERC. I do not agree with the Department's contention that 4xx/8xx courses serve graduate students well.

16. **Recommendations.** There appeared to be no seminar committee charged with the seminar program, and organizing an excellent program is a huge responsibility to devolve upon a single faculty member. If there is reorganization of the committee structure in MBB, the seminar program should be added to the list. This committee could then ensure that seminars occur regularly, and institute a mechanism to ensure that all students can learn something from each seminar. Students suggested food as a lure. At some schools, there is a pre-seminar session at which graduate students and a local faculty member (often the host) meet to discuss one or two important papers from the speaker's laboratory. This brings students to a level where they can understand enough so that going to a seminar is worthwhile. The pre-seminar program could be constructed as a course with credit for attendance.

I agree with this and the Department seems to agree at least in part.

17. **Recommendations.** Clarify procedures. Adding students to Departmental email lists may be one simple mechanism to improve the lines of communication. In addition, there should be more inclusion of graduate students in planning and decision-making, particularly in areas that affect them directly such as courses, curriculum, and requirements for students. This participation will enhance their ability to function effectively when they themselves become faculty members.

The Department seems to have accepted this recommendation. In their response, they state in part that a member of the Graduate Student Caucus is involved in decisions on "acceptance of students, ranking of scholarship applicants...". In my opinion this is not appropriate. There is a clear potential conflict of interest.

18. **Recommendations:** DMBB already faces numerous organizational and structural challenges consequent to its rapid growth and to its transition from an Institute into a Department. At this time, another major reorganization or realignment involving DMBB and a new Faculty would appear to us to be ill advised. However, the Faculty of Health Sciences potentially will provide many new opportunities for individual DMBB researchers to establish research and teaching links, and DMBB will provide the Faculty with a proximate, dynamic group of biomedical scientists that will help enable its recruiting and program development activities.

I agree entirely with this statement.

19. **Recommendation:** Clear lines of command need to be established within the Department, and substantial delegation of responsibilities from the Chair to the Departmental Administrator, and to faculty committees, needs to be achieved. Faculty committees, at least for important matters such as graduate training, curriculum development and review, and technical/space resource allocation, need to be provided with a real role in Departmental governance. Communication has to be improved so that all Departmental stakeholders (students, staff, teaching, tenure-track, and tenured faculty) know what is going on, and feel that they have a say.

There are a number of possible administrative styles. I personally agree with the recommendation of the ERC but the Department seems in large part to reject it.

SCUP-FHS.MBB

From dean@cs.sfu.ca Thu Feb 10 19:23:09 2005
Date: Mon, 7 Feb 2005 09:36:25 -0800 (PST)
From: Charmaine Dean <dean@cs.sfu.ca>
To: brandhor@sfu.ca, scdean@sfu.ca
Cc: krane@sfu.ca, jhw@sfu.ca, FHS David MacLean <dmaclean@sfu.ca>, FHS Colin Jones <colin_jones@sfu.ca>
Subject: SCUP - FHS & MBB

Dear Bruce,

The SCUP meeting papers for the meeting on February 9, 2005 includes a recommendation that MBB consider the opportunities afforded by the establishment of the new FHS.

This is a memo in response to that recommendation to indicate interest and support for pursuing this development.

In particular, we are currently working with Jamie Scott to develop a proposal for a graduate program in Infectious Disease and Toxicology. Professor Scott gave a presentation to our Faculty Graduate Studies Committee outlining ideas for such a proposal on January 24th. We will be forwarding comments to her tomorrow on the ideas presented, after discussion at today's FHS graduate studies meeting.

We expect strong connections with MBB and I would be happy to meet to pursue ideas you may have.

All the best,

Charmaine

C.B. Dean
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