

## SENATE COMMITTEE ON UNIVERSITY PLANNING

### Academic Unit Review – Summary

**Department:** Chemistry and Biochemistry

<b>Site Visit</b>	17-18 March 2010
<b>Date of Report</b>	May 2010
<b>Informal Response to Planning</b>	June 2010
<b>Formal Response to Planning</b>	October 2010
<b>Implementation Update</b>	Expected Winter 2012
<b>Midterm Review</b>	Expected Fall 2015

#### Summary of Departmental Self-Study

The Department of Chemistry and Biochemistry was established in February 2009. Before that date, the Biochemistry Program was autonomous and was variously housed in the Chemistry and Biology Departments. The new Department has six chemists and two biochemists as well as a number of technical staff. Two defining features of the programs are the extensive laboratory and independent research experiences provided to students. When the units merged, changes were made to the first and second year course requirements for Majors and Honours to allow students to be equally prepared for either discipline by third year. As well, significant changes have been made recently to the Chemistry Honours and Majors programs in order to increase flexibility for students and allow them to concentrate on specific sub-disciplines in their upper years.

Research foci for faculty members include streams in basic science (inorganic chemistry, environmental chemistry, biochemistry, bioorganic chemistry, and physical/material chemistry), applied science (medicinal chemistry, green chemistry, polymer chemistry, energy, biotechnology, bioinformatics, semiconductors, sensors), and educational research. A high quality research environment is essential for training high quality undergraduate students. The Department is involved in a number of service and outreach activities, as well as partnerships with other Departments at Mount Allison and with numerous institutes and labs around the world.

Both programs report challenges in staffing. In 2007, a retiring organic chemist was replaced by a biochemist. This has reduced options for students in the chemistry program. While additional resources have been provided to biochemistry, burgeoning enrolments have resulted in significant pressure on teaching and supervisory capacity.

The Department is undertaking a major strategic planning exercise and curriculum review. In addition, they plan to work towards the following priorities:

- Plans to provide for the acquisition, maintenance, and technical staff allocation for the operation of major instruments;
- Develop plans for sabbatical cycles to minimize student disruption;
- Work closely with Facilities Management on the Barclay fume hood replacement and other projects.
- Develop creative timetabling strategies to accommodate for the expansion of the teaching laboratories;
- Develop plans for the replacement and reallocation of technical staff;
- Rationalize first-year offerings to optimize the lab experience and ensure complementarity between the first three courses;
- Revamp the second and third year teaching labs;
- Provide more variety of research experiences for undergraduate students;
- Explore possible offerings in commercialization and biotechnology, possibly in collaboration with the Ron Joyce Centre for Business Studies.

The self study includes extensive testimonials from current and former students.

### **Summary of External Reviewers' Report**

The reviewers provided the following executive summary of their report:

*The recently-formed Department of Chemistry and Biochemistry at Mount Allison University is a strong education and research environment for undergraduates, which is at a critical point in its development. Without immediate attention to developing a unified approach to its future, there is a real danger of it losing its status as a Canadian leader in undergraduate chemical education. It is critical that the Department undertake the following steps:*

- *Carry out a strategic planning exercise in order to identify a shared vision for the future and a plan for its attainment*
- *Carry out a comprehensive review of curriculum, with emphasis on shared programmatic goals, balanced teaching loads, and a renewed commitment to high academic standards*
- *Increase academic and support staff levels, which in biochemistry are below the viability threshold and in chemistry are in some areas below viability*

More specifically, the reviewers expressed concern about the non-integration of the chemistry and biochemistry programs. They also made the following recommendations:

#### **RECOMMENDATION 1:**

*The department undertakes a thorough strategic planning exercise, preferably with an impartial facilitator.*

**RECOMMENDATION 2:**

*That the University seek to hire a senior (mid-career) faculty person with the next academic hire within the Department. The best scenario would have this be an external search for the next Head.*

**RECOMMENDATION 3:**

*The department should gain two new tenure-track faculty positions (in addition to the current new Biochemistry position).*

**RECOMMENDATION 4:**

*The department should obtain one new Biochemistry instructor, and some technical staff positions should be converted to twelve-month appointments.*

**RECOMMENDATION 5**

*A complete curriculum review needs to be carried out.*

**RECOMMENDATION 6**

*A major emphasis of the curriculum review should be on standards.*

**RECOMMENDATION 7**

*The committee strongly recommends that whatever curriculum reforms are implemented, they meet national accreditation standards.*

**RECOMMENDATION 8**

*Career and mentoring should be formalized so that it doesn't depend on individual faculty/student conversations; annual information sessions and career advice resources should be developed.*

**Summary of Departmental Response**

The Department is generally supportive of all the report's recommendations. Its response includes specific planned actions for each recommendation as well as targeted completion dates. They agree that the reviewers' concern about the non-integration of the chemistry and biochemistry programs is valid and will address this through a thorough curriculum review. The Department sees an immediate and urgent need for two net new tenure-track positions: a position in biochemistry/organic chemistry and one in biochemistry/analytical chemistry. These positions would increase and enhance the cross over between the programs. There is not a consensus that the current search should be for a mid-career faculty member who would assume the headship in the near future. The Department would like to convert the current half-time lab instructor position to full time and to increase another one from an eight- to a nine-month sessional position. It is planning to reintroduce quantum chemistry as a requirement in the Honours

chemistry program as part of the curriculum review; this will address some of the reviewers' concern about standards.

In addition to reaffirming the goals outlined in the Self Study, the Department also plans to:

- Continue to sponsor a Visiting Speaker series
- Use the strategic planning process to identify gaps in research coverage, develop plans for acquiring research chairs, and determine the required research focus of future hires;
- Review all teaching/research equipment requirements;
- Consider the renovation of Chemistry/Biochemistry stores

The Department expressed disappointment that the report did not provide more guidance with respect to curriculum.

### **Planning Committee and Provost Response**

The Planning Committee was very impressed by the Department's Self Study and engagement with the process. It is supportive of the recommendations in the external report and the Department's response to them. The Committee is particularly pleased to hear of the Department's commitment to undertake a thorough strategic planning process and major curriculum reevaluation in order to address the significant issue of integration of the programs. It looks forward to learning the results of these processes as part of the implementation update during Winter 2012.

The Committee recognizes the need to address staffing in biochemistry and sees this as a higher institutional priority than organic chemistry. It supports the creation of a net new position, which should be at least 75% devoted to biochemistry. Planning also acknowledges the important role played by technicians and lab instructors and encourages the Department, with the assistance of the Dean, to continue to work on plans for the replacement and reallocation of technical staff.

The Dean will consider the ongoing personnel and other resource requirements of the Department as part of the 2011-12 budget process (as well as in future years).