DEPARTMENT: BIOMEDICAL SCIENCES

DATE: April 1, 2012

1. Five years from now, what would you like your DEPARTMENT to be known for?

   a) Nationally and internationally?

   i) High quality research and graduate training in biomedical disciplines, with core strengths in Cancer Biology/Carcinogenesis, Cardiovascular Biology, Reproductive Sciences and emerging strengths in Regenerative Medicine/Stem Cells, Biomechanics and Neurobiology/Neuropharmacology.
   
   ii) Emerging center for translational (both naturally-occurring and induced) models of human disease and therapy (as part of College-wide initiatives).

   iii) Innovative, high quality undergraduate education in the Biomedical Sciences, producing graduates who thrive in graduate and professional programs.

   iv) High quality, comprehensive and innovative preclinical education in the veterinary medical sciences.

   b) Within the college and university?

   i) Strong, focused research programs in important biomedical disciplines and “go-to” expertise in concepts and approaches to the study of disease at levels extending from the molecular to whole animal physiology and structure.
   
   ii) Collegial and engaged faculty, staff and students with strong interests in collaboration and multidisciplinary approaches to important animal and human health problems.
   
   iii) Strong participation in the core curricula of the Veterinary Medicine and Biomedical Science majors with significant contributions to electives in other university programs.

   c) Within your department (by the faculty, staff and students)?

   i) A dynamic working and learning environment that incorporates collegiality, cooperation, fairness and hard work into the pursuit of excellence in the teaching and research mandates of the Department.

2. What major initiatives do you have planned for the coming year that will help you achieve this distinction?

   i) Further development of the research laboratory space available in Biomedical Sciences, to serve the needs of interdepartmental programs in Cancer Biology, and Stem Cell Biology/Regenerative Medicine.
ii) Increase undergraduate teaching efficiency by moving to a more “learner-centered” model in several course offerings and through the combination of content in some Phase 1 DVM courses.

iii) Implementation of new distance-education course offerings to increase the scope, exposure and revenue of existing courses.

iv) Develop new inter-collegiate graduate programs in Cancer Biology and Cardiovascular Biology, to build on growing research strengths in the OVC.

THEME I: VALUES, RELATIONSHIPS, COMMUNICATION

GOAL: To better integrate Biomedical Sciences and with other units in the College and the University.

Objective 1: Development of research and teaching programs that cross traditional departmental boundaries.

Actions:

(1) Development of an integrated cancer biology program, linked to the departments of Clinical Studies and Pathobiology, as well as to the department of Molecular and Cellular Biology in the College of Biological Sciences.

This aim represents a continuation of the program initiated in the last 5 year Integrated Plan for the College. The development of the Institute for Comparative Cancer Investigation (ICCI) in 2007 provided a strong foundation for the further development of cancer research and treatment at the University of Guelph. The department’s efforts in this area represent a component of larger initiatives to further develop cancer treatment, research and teaching in cancer biology, included in the overall OVC integrated plan.

Winter – summer 2012: submission of an application to the Canada Foundation for Innovation (CFI) and the Province of Ontario for expansion of the Biomedical Sciences cancer research laboratories (an initiative led by Drs. Brenda Coomber and Jim Petrik).

2012-2013: development of a proposed Intercollegiate graduate program in Cancer Biology (see below; Theme IV).

(2) Develop enhanced stem cell biology and regenerative medicine research laboratory space. An application to CFI has already been made to further develop one of the third floor Biomedical Sciences labs, to provide greater opportunities for development of research in stem cell biology and regenerative medicine, which will form the basis for collaborative initiatives in future between Biomedical Sciences and Clinical Studies.

(3) Further enhance the relationships between Biomedical Sciences and other University teaching programs (Human Health and Nutritional Sciences, Integrative Biology, Psychology). There remains substantial overlap between many of the courses serving the BIOS, Biomedical Sciences, HK and Psychology majors. Better integration of these
course offerings offers the potential for considerable savings in terms of teaching time for Biomedical Sciences faculty, which will create the opportunities for further growth of the department’s graduate programs.

THEME II
B.Sc. and DVM CLASSROOM AND LABORATORY LEARNING

GOAL: To streamline and improve the courses offered by Biomedical Sciences

Objective 1: To decrease the amount of teaching time required for the Phase 1 curriculum, reducing redundancy in existing course offerings and enhancing the student learning experience.

Actions:

1. Integrate the current veterinary physiology (VETM*3080) and veterinary biochemistry (VETM*3000) courses, to reduce redundancy and enhance learning opportunities. The existing veterinary physiology and veterinary biochemistry courses deal with subjects that overlap to a substantial extent. Closer integration of these two courses will reduce total lecture time in Phase 1, while providing a more satisfying experience for the Phase 1 students.

2. Decrease the amount of didactic teaching time in Phase 1. VETM*3080 and VETM*3000 currently include more than 120 hours of lecture and tutorial time in Phase 1. Better integration of these courses with the department’s other offerings at the B.Sc. level (in particular the new DE version of Mammalian Physiology, BIOM*3200DE, see Theme V, below) will potentially allow a substantial reduction in the required Physiology lecture time in Phase 1. In coordination with the DVM curriculum committee and the OVC admissions committee, ways will be explored to reduce the redundancy that currently exists in the curriculum for entering Phase 1 students. This will both reduce faculty teaching time and increase the time available for Phase 1 students to start exploring the more advanced clinically-oriented material that is currently positioned later in the DVM curriculum.

3. Better integrate Biomedical Science Phase 1 courses with elements later in the DVM curriculum. Integration of the current departmental offerings in Veterinary Histology and Veterinary Anatomy with elements in the Phase II and Phase III curriculum (notably the Principles of Disease course in Phase II; and the proposed new surgical skills lab in Clinical Studies) offers the potential to enhance student learning opportunities and better prepare students for their clinical training, without increasing the time required in the DVM curriculum.
Objective 2: To better integrate the department’s current graduate and undergraduate B.Sc. course offerings.

Actions:

(1) Growth in the department’s graduate program has required a commensurate growth in the number and frequency of the Biomedical Science graduate courses. Concomitant growth in the undergraduate B.Sc. student numbers has created parallel pressures on the department’s undergraduate courses (particularly in the fourth year of the B.Sc.). This offers both a challenge and an opportunity. By restructuring the third year core Biomedical Sciences courses, so that students are prepared for a more independent learning style, it becomes possible to integrate fourth year B. Sc. and first year M.Sc. courses. This reduces faculty teaching time, while greatly enhancing the learning opportunities for the fourth year B.Sc. students.

This initiative has already been under way for several years, and will probably continue for 2-3 years more (see also Themes IV and V, below). Cancer Biology (BIOM*4150) Principles and Practice of Health Sciences Research (BIOM*4210) and Cardiology (BIOM*4180) are courses that have been introduced in the last few years, integrating graduate as well as fourth year undergraduate components; these courses have become extremely popular with students. Existing courses (BIOM*4030 and BIOM*4050) have been modified to follow similar formats, attracting substantially larger numbers of students in the process.

Further developments will include provision of more independent learning components into the existing third year Biomedical Sciences courses, as well as introduction of the new BIOM*4300 (Biomedical Communications) course in Fall 2012, to better prepare undergraduate students for the independent research and presentation assignment components that are increasingly standard in our fourth year B.Sc. courses.

THEME III
PATIENT/CLIENT BASED LEARNING, RESEARCH AND HEALTHCARE

Goal 1: Increase opportunities for graduate student training in clinically-oriented projects.

Objective 1: Create “streams” within the Masters of Biomedical Science (MBS) program that focus on the unique opportunities that exist for graduate teaching in the OVC.

The OVC attracts students from all over Ontario, not just to the DVM program but also to undergraduate B.Sc. programs at the University of Guelph, because of student interest in health care and its applications to veterinary medicine. However, the opportunities for students to become practically involved in work they are interested in at the OVC are relatively limited, unless they are able to either volunteer in the OVC or gain entry to the graduate programs in Pathobiology, Population Medicine or Clinical Studies. Expansion of training programs for
undergraduate and early career graduate students in the OVC represents a huge potential opportunity for growth, particularly in the MBS program where student interest currently outstrips our ability to offer placements.

Actions:

(1) Appoint a faculty coordinator specifically for the MBS program. The MBS course-based program was initiated only a few years ago, as an offshoot of the conventional thesis-based M.Sc. program. While it has attracted a steady stream of students in the past four years, a clear focus for the program has not been established. Part of the reason for this is that the responsibility for these students has until now rested with the departmental graduate coordinator, who is simultaneously responsible for the entire thesis-based program. Creation of a second graduate coordinator position, responsible only for the MBS students, will provide a focus for the program as well as a contact person for faculty in other departments who may have projects suitable for MBS student participation.

(2) Develop and expand training opportunities in assisted reproductive technologies. The Reproductive Biology labs on the third floor of Biomedical sciences utilize a number of techniques that are currently standard practice in human Assisted Reproductive technology labs across Canada. There is considerable interest among both students and potential employers in training in these techniques. A “stream” in the Biomedical Sciences MBS program was established three years ago, in conjunction with Hamilton-McMaster medical center, to allow students to train in this area and observe how these techniques are utilized in human assisted reproductive technology laboratories. Further expansion of these opportunities may be possible, in future, with the introduction part time and diploma training programs for health care professionals interested in this field.

(3) Capitalize on student interest in being involved with clinical projects to develop an MBS stream that focuses on experiential learning in more clinically-oriented MBS projects and, potentially, clinical trial participation. Many MBS as well as undergraduate B.Sc. students currently express an interest in becoming more involved in the research programs in the OVC. Their opportunities to do so are, however, limited to undergraduate volunteer and fourth year B.Sc. project courses. This is an untapped resource. In conjunction with the development of enhanced clinical trials capacity in the OVC (College integrated plan proposal 8.2) opportunities will be sought for increased involvement of MBS students in aspects of clinical trials research, as well as potentially other short-term research projects elsewhere in the OVC.

THEME IV
RESEARCH AND GRADUATE PROGRAM

GOAL 1: Further develop Research Laboratory Facilities serving intercollegiate, interdisciplinary programs

Objective 1: Obtain additional funding to support lab renovations.
Actions:

(1) Funding applications already submitted (discussed previously, Theme 1). If the CFI applications are successful, efforts will be required over the next 12 months to secure Ontario Provincial matching funds, then to develop final plans for the lab renovations commensurate with the budgets available. Departmental funds to support the necessary institutional contribution to these applications have already been set aside.

GOAL 2: Increase the scope and prestige of graduate programs in the department

Objective 1: Develop intercollegiate graduate programs, to capitalize on our existing areas of research strength (College Integrated Plan proposal 8.1).

The growing research strengths in Cancer Biology and Cardiovascular Biology at the OVC are not currently well-recognized outside the college, or at other universities in Ontario. Integration of our current graduate programs with other programs sharing complementary interests at the University of Guelph offers the opportunity to attract more, and better, graduate student applicants, while increasing the profile of our research programs across the Province.

Actions:

(1) Develop intercollegiate graduate program in Cancer Biology. Linked to the ICCI, an Inter-collegiate graduate program in cancer biology will be developed using the model already formulated during the last 5 year Integrated Plan to develop the Intercollegiate graduate program in Neuroscience. This will allow expansion of the existing links between Pathobiology, Biomedical Sciences, Clinical Studies and Molecular and Cellular Biology. Utilizing existing graduate courses, coupled with a new inter-collegiate seminar series, opportunities will be expanded for students in each of the participating departments to specialize in Cancer Biology, in a way that will be recognized on their transcripts as part of a University accredited program.

This proposal will take approximately two years to reach fruition. The first steps, to be initiated in 2012-2013, will be to develop the necessary applications to the University Board of Graduate Studies and the Ontario Universities Council on Quality Assurance.

(2) Develop intercollegiate graduate program in Cardiovascular Biology. Growing interest in Cardiovascular Biology in Biomedical Sciences and the department of Human Health and Nutritional Sciences in the College of Biological Sciences offers the opportunity to develop an Intercollegiate graduate program in Cardiovascular Biology. The steps involved and the timescale are similar to those for the proposed Cancer Biology program.

(3) Further develop and enhance the department’s graduate course offerings. More high quality graduate course offerings are required to accommodate increased student enrolment while not overly burdening existing and future graduate faculty. This can be achieved by harmonizing existing coursework with the development of new, learner-
driven credit courses in the Biomedical Sciences graduate programs, improving trainee's mastery of focused literature, critical evaluation of scientific publications, communication skills, and time management. Graduate offerings will be designed so that each didactic type course is followed by a journal club/seminar course on the same theme; the first course in the series (or equivalent) would be a prerequisite for the relevant seminar course.

<table>
<thead>
<tr>
<th>THEME V. FISCAL VIABILITY</th>
</tr>
</thead>
</table>

**GOAL:** To maintain a balanced and stable budget in the face of declining inflation-adjusted Provincial funding and rising costs.

The department’s ability to continue to meet its obligations, to maintain the teaching responsibilities associated with expanded undergraduate and graduate programs, as well as to fund new developments (such as the departmental contributions to the proposed space renovations) absolutely depend on fiscal stability. This, in turn, depends on developing additional sources of income: without them, inflation will gradually erode our ability to hire replacement staff and sustain our existing research programs.

**Objective 1:** To develop additional sources of revenue for the department and College

**Actions:**

1. Translate existing core didactic B.Sc. Courses to DE format, to increase flexibility in the B.Sc. curriculum and enhance income.

   Winter and Summer semesters, 2012: utilize grant obtained in 2011 from Open Learning to translate BIOM*3200 (Mammalian Physiology) BIOM*3090 (Principles of Pharmacology) and BIOM*4090 (Pharmacology) to DE format.

   Fall 2012 – Winter 2013: introduce new DE courses into the curriculum, in a phased fashion, to dovetail with the existing conventional lecture courses.

2. To further increase graduate enrolment, in both the MBS and thesis-based M.Sc./Ph.D. graduate programs. Through the various initiatives, outlined above, continue to meet the department’s component of the University targets for eligible graduate student enrolment.