

Implementations of Suggestions from Dr. Robert Kerr's
Recommendations and Commendations of ACAPLAN for the
Undergraduate Program Review for BEHAVIOURAL
NEUROSCIENCE

The relevant documentation that includes (in reverse temporal order): 1) the report of the Academic Planning Committee (ACAPLAN) to the regular December 2011 Senate, 2) my response (20 October, 2011) to the draft of that report, 3) Dr. Kerr's draft report of 26 September, 2011, 4) my response of 7 May 2011 to the Neuroscience Program Review, 5) the Neuroscience Program Site Visit of December 2010, and, 6) the history and information of the Program have been archived as a PDF entitled "NeuroscienceProgramReviewFile" for those interested in the history of the process. The pdf can be accessed from the Dr. Kerr's Office or from me directly. These documents allow context.

In the interest of parsimony the content of those documents will not be reiterated here. The following succinct responses summarize what has occurred since the issuing of the attached Report of December 2011 from ACAPLAN to the Senate. The most important fact is that the Behavioural Neuroscience Program is one of the oldest of such interdisciplinary programs in Canada and is composed of courses from *Chemistry, Biology, and Psychology*. From its creation the operation of the Program has been responsible to the Dean of Science and Engineering. Behavioural Neuroscience is a truly interdisciplinary program that depends upon the knowledge and collaboration between multiple disciplines that include the Sciences, Arts and Humanities. The comments and recommendations within the December 2011 Report from ACAPLAN, to which this letter is addressed, was primarily derived from the site visit report and focused *exclusively* upon the courses taught within the *Psychology* component of the Program. The comments from the Report of the Academic Planning Committee are presented below in *italics Times New Roman font* while my responses are indicated in Georgia straight font.

*REPORT OF THE ACADEMIC PLANNING COMMITTEE
TO THE REGULAR December 2011 SENATE*

FOR INFORMATION

Recommendations and Commendations of ACAPLAN following the Undergraduate Program Review: BEHAVIOURAL NEUROSCIENCE

The program's self-study was completed on 1 June 2010 and on 11-12 December 2010, the review team studied the program. The team included one student in the program (Paula Corradini), two Laurentian faculty members (Mazen Saleh, Biology; David Robinson, Economics), and two external consultants, Dr. Dawn Good, a registered psychologist who is currently the Director of Brock University's Centre for Neurosciences and Dr. Roelof "Rudy" Eikelboom, Chair of Wilfrid Laurier's Department

of Psychology. Dr. Eikelboom also served as chair of the review committee. The committee reported sometime in early 2011 and the program response was received on 7 May 2011.

1. Overall the Committee concluded that “Over its 29 years, this program has done a great job in producing a small number of high quality students with a very rich knowledge of behavioural neuroscience. Dr. Persinger is to be complimented as both the Coordinator, and sole constant faculty presence in this program, on his dedication and commitment to his students, the program, and Laurentian University.” They further noted that “Neuroscience has grown immensely in the years since the program was founded” and that “Laurentian is well positioned to transform this Behavioural Neuroscience program into a modern first class neuroscience program.” In order to achieve this goal the principle recommendation was to expand the current program into an interdisciplinary **collaborative** program in Behavioural Neuroscience by involving faculty members from various departments throughout the University. In parallel with this was a need to “Review and update program/course content providing lab space and teaching aid support to permit delivery of current content.” Without such changes the reviewers expressed the view that the program was not sustainable in the longer term.

Response to 1.

The interdisciplinary nature and **collaborative** integration of the Behavioural Neuroscience Program is reflected in the expansion to include individuals who now teach the **Psychology** component core courses. Dr. Lafrenie (cross appointed to the Medical School and Department of Biology from Laurentian Hospital Cancer Research Group) teaches Current Developments, Dr. Mariani (from the Psychology Clinical Section at Laurentian Hospital) now teaches Human Clinical Neuropsychology, Dr. Blake Dotta (recent graduate of the Biomolecular Sciences Program) now teaches Electromagnetic Chemical Bases of Behaviour, and Dr. Linda St-Pierre (Ph.D. Integrative Biology from Guelph University) co-teaches or teaches Advanced Human Neuroanatomy, contributes to Behavioural Neurobiology (a third year course) and facilitates the general integration of the Program and its Laboratories.

During the last two years because of the removal of overload options from the Dean of Social Science and Humanities budget, the core courses designated under “Psychology” have been maintained by creative integration of funding from external financial sources contracted to the Coordinator of the Program to pay the salaries of the two to four Faculty Members who each teach one of the core (required) courses in the Psychology section. Those courses are Brain and Behaviour (2nd year), Behavioural Neurobiology (3rd year), Psychoneuropharmacology (3rd year), Human Neuropsychology (2nd year), Advanced Human Neuroanatomy (4th year), Electromagnetic-Chemical Bases of Behaviour (Memory and Consciousness; 4th year) and Current Developments in the Neurosciences (4th year). The course content increases in difficulty and

interdisciplinary inclusiveness each year such that pre-requisites are essential and all courses *are required* to be given every year.

An ancillary goal is for most students to be engaging in publishing-level research by the end of their third or fourth year. This begins with the third year Neuropharmacology course where the laboratory is designed to involve novel experiments. Within the last two years graduates of the Program who are presently enrolled in on-campus Masters or Doctoral Programs have published over 60 articles in scientific (refereed) journals. These include areas such as Clinical Psychology, Experimental Psychology, Biophysics, Physiology, Physical Neuroscience, Quantum Chemistry, Geomagnetic-Solar Brain and Behaviour relationships and interdisciplinary integration. One graduate was the first to apply advanced microstate, quantitative electroencephalographic brain imaging analyses to discern mild closed head injury; the technique was developed in the undergraduate thesis. The comment “*Laurentian is well positioned to transform this Behavioural Neuroscience program into a modern first class neuroscience program*” misses the point. The program is already a modern first class neuroscience program. At Laurentian University we **initiate we do not imitate and we lead, not follow.**

- 2. There are several reasons that would support the further development of this program. First, Behavioural Neuroscience has become a niche program that has attracted—and retained—high quality students. Second as the report notes, Laurentian is consciously building a rich assortment of programs with a health science focus. Behavioural Neuroscience is an integral part of the health sciences and for that reason alone deserves “to move forward”. Third and most importantly, the program is uniquely built on the disciplines of psychology, biology, chemistry, and physics. In February of this year, Senate’s new Academic Plan suggested the future of academic programming at Laurentian lay in part in the development of interdisciplinary studies.*

Response to 2.

A portion of the response to this statement was accommodated in Response 1. The Behavioural Neuroscience Program is not constrained to only a health science focus. Such containment is limited in both philosophy and methodology. Behavioural Neuroscience is a unique program that is interdisciplinary in the truest and classical sense. Binding it to a health science context will diminish its integration with the Arts, Humanities and Physical Sciences. It is optimal where it is now, under the Direction of the Dean of Science and Engineering, and with the inclusive philosophy and openness to all methods of approach and problem solving.

- 3. Given the noted strengths of the program, the collaborative focus recommended by the Review Committee, and that new faculty hires within the University will be quite limited for the foreseeable future, it is urgent that plans be put in place to sustain this program. ACAPLAN is of the view that the University should*

*support the development of an interdisciplinary **collaborative** program in Behavioural Neuroscience in accord with the major recommendations brought forward by the review committee. In preparing its commendations and recommendations, ACAPLAN has changed past practice and, per the new IQAP Policy, has reformatted its comments so that they are clearly targeted to the body that can actually implement any recommendation. While ACAPLAN can only expect a report from the program in 18 months on how it dealt with the recommendations directed to it, ACAPLAN hopes that any other body referenced in this assessment will also report within the same time-frame, in this case, June 2013. After review, ACAPLAN will table the reports it has received at Senate.*

Response to 3.

As mentioned in Response 1, the Behavioural Neuroscience Program has been and remains an interdisciplinary **collaborative** program as defined by the course requirements which include one-third Biology, one-third Chemistry, and one-third Psychology (with emphasis on neuroscience). Consequently it has always been collaborative.

Program Coordinator

Student Issues

1. *Commendations*

- a. The program has been remarkably successful in training a small consistent number of students in both the academic rigours of the field and in encouraging a research spirit that would be the envy of most other schools that offer neuroscience programs.*
- b. Students are enthusiastic about the program and felt that they had received a rigorous, challenging, exciting education.*
- c. Students in the graduate program support and mentor undergraduates.*

Program Issues

1. *Commendations*

- a. The program is appropriately placed within the Faculty of Science and Engineering.*

2. *Recommendations*

- a. This program will have to change significantly and in ways that vary extensively from its current form; it requires a different more cooperative model.*

Response to 2a.

The contents of the Psychology Department courses, as are the core courses from Biology and Chemistry, are reviewed yearly. The newest course of this section, Current Developments in Neuroscience, had been implemented for that purpose. The course content also includes the original, ongoing, and advanced interdisciplinary ideas and experiments of the Neuroscience Research Group (NRG). The Members of the NRG are M.A., M.Sc., or Ph.D. students who were

graduated from the undergraduate Behavioural Neuroscience Program and contribute greatly to the laboratories and theses supervisions. They are role models for the undergraduate students. The Coordinator of the Program has published about 500 articles in areas ranging from Astronomy to Zoology. As mentioned in Response 1 and 2, the Program is already a different, cooperative model. There are three disciplines centrally involved: Chemistry, Biology and Psychology with options to explore any other discipline in the Sciences, Arts, and Humanities.

The Dean of Science and Engineering

1. Recommendations

- a. *The current best practices in Health and Safety in a university laboratory setting have to be implemented on an ongoing basis.*
- b. *Review and update program/course content providing lab space and teaching aid support to permit delivery of current content. Given that the “space dedicated to this program seems to be carved out of scavenged space...not otherwise used”, the Dean should review available space in the Faculty of Science and Engineering to establish whether there is more suitable space for the program.*
- c. *The Program requires significant changes and expansion of faculty and expertise to reflect the discipline in its current form and take advantage of the interdisciplinary nature of Neuroscience. To expedite a transition to a new model for the Behavioural Neuroscience the Dean should organize a meeting with all individuals who have an interest in Neuroscience, broadly defined, to determine whether there is a community that would move this undergraduate program to the next stage of its development. This Committee could act as a resource for the program and move it into a model that could serve the University for the next 25 years.*

Response to 1. Recommendations

a. The laboratories are routinely and frequently assessed by the university's Chief Laboratory Safety Office, Gail Cowper-Benoit and her colleagues. In addition all of the M.A., M.Sc. Ph.D. and undergraduate Behavioural Neuroscience students have the appropriate certificates and training, or, are supervised appropriately. This has been the practice.

b. The spaces for the undergraduate laboratories are rooms within the Biology Department. These are optimal spaces. For advanced work the Neurochemistry lab is on the first floor of Science I and the Consciousness/EEG/Photon Laboratory is within the unique space of the basement of the classroom building.

c. There is already a committee that is composed of the people who teach the Psychology component of the courses. All of the other courses in the Physical Sciences and Arts are contributory to the general knowledge base. The integrative nature of the M.Sc. in Biology, M.A. in Psychology and M.A. or M. Sc. in Human Development in conjunction with the balance between the Ph.D. programs in Biomolecular Sciences and Human Studies are now optimal avenues for

application of this undergraduate preparation. The Program still attracts the interdisciplinary, problem-solving student whose major focus is creativity and discovery. This requires Faculty whose styles foster and understand this approach. Most of the graduates from the Program pursue Masters, Doctoral, Medical, or Law degrees.

The Vice-President Academic and Provost

1. Recommendations

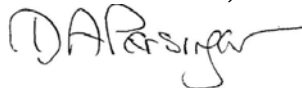
- a. *A greater number of faculty members need to be identified who can share some of the teaching load and supervision of undergraduate students' research in this Program. This should first take place for the 4th year courses, and then gradually for the teaching of third and second year courses can be assigned to others without it having a profound effect on the well-being of the students currently in the program.*
- b. *Establish a permanent administrative and advisory core with offices for the Coordinator or Director with appropriate administrative support, with a working budget.*
- c. *Increase funding to the Program appropriate for the above activities (e.g., resource funding for Administrative support, teaching assistantship support, materials and equipment for labs (animal and other)).*

Responses to 1a, 1b, and 1c.

a. As noted in the first Response, Dr. Lafrenie, Dr. St-Pierre, Dr. Mariani, and Dr. Dotta in addition to me are now more involved with the supervision of undergraduate students and the teaching load. There are also senior Ph.D. students in Biomolecular Sciences, particularly Professors Lukasz Karbowski and Nirosha Murugan, and in the Human Studies Program, particularly Professors Kevin Saroka and Mandy Scott, who actively supervise approximately 6 to 14 Behavioural Neuroscience undergraduate theses per year.

b. No offices are required for the Coordinator because his central office (S126) is also the shared interaction area (meeting space) with the Neuroscience Research Group. There is no working budget per se. However a parcel of money from external funding is employed to pay the salaries of some of the professors who teach the course in the Psychology component of the program. Future salaries will be required.

c. There has been no support from the university but a recent 1.3 million dollar funding source to study the interdisciplinary and completely novel methods for slowing and measuring cancer has substantially increased the equipment for measuring quantitative brain activity and imaging, photon emission counts, biomolecular techniques, and electronic technology.



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20 December 2014