Report on the
Strategic Directions of Research
Basic Science Departments
University of Ottawa Faculty of Medicine

August, 2005

In late June, 2005, Faculty of Medicine members from the four Basic Science Departments (CMM, BMI, Pathology, Epidemiology) held meetings to discuss the strategic directions for their research mandate over the next three years. This report outlines the results of these discussions. It represents a faculty consensus and was written up by each of the leaders of faculty sub-groups tasked to consider the elements of each strategy:

Dr. Ken Dimock (Credibility/Visibility and Community Awareness)
Drs. Christine Pratt/Mads Kaern (Maintaining Quality)
Dr France Gagnon (Collaborations/Linkages)
Dr Stephen Gee (Managing Efficiently)
Assembly Consensus (Academic Autonomy in a Commercial/Applied Environment)

The report has been edited/reviewed by all group leaders as well as other participants attending the strategic directions meetings.

Strategic Directions for the University of Ottawa Faculty of Medicine Basic Science Departments

June, 2005

A. Introduction:

Upwards of 30 faculty from the Faculty of Medicine's four basic science departments (CMM, BMI, Pathology, Epidemiology) met in two sessions to discuss and map out strategic directions for the way in which they approach their research mandates over the next three years.

In the First Session, the group contributed its collective insights and evidence on the current health research environment as well as their ideas on the trends that will lead to future change. They looked at the environment from its broadest aspect, globally, and focused progressively down through national, provincial, university, faculty, and core research department perspectives. From this range of perspectives, five key issues emerged with respect to challenges that must be met to ensure that the Departments make significant advances within the Faculty of Medicine's research function in the competitive field of Canadian health research.

Broadly, the key challenges identified cluster into the following groupings:

1. Collaborations/linkages.
2. Credibility/Visibility and Community Awareness
3. Enhancing Quality: Students; Academic staff; Research.
4. Academic Autonomy in commercial/Applied Environment.
5. Managing Efficiently.

In the Second Session, these five issues served as the base from which the group developed its strategic directions for success over the next three years. The group also defined the mission statement that guides the planning of the Faculty's research departments.

The five strategic directions are to:

1. Build better collaborations and stronger linkages internally and external to core research function.
2. Build credibility, visibility and community awareness of the core research function.
3. Build on current strengths to enhance the quality of graduate students, academic programs and basic science research.
4. Maintain academic autonomy within the current trend towards commercialized science research.
5. Manage the core research function efficiently.

Mission Statement:

The University of Ottawa Faculty of Medicine's research function generates new knowledge to improve human health and educates highly qualified personnel for the benefit of Canadian society.

B. The Key Issues:

1. Collaborations/Linkages:

There are problems of communication and collaboration that begin at the departmental level (where they are most severe) and extend to the Faculty, the Faculty's affliated Research Institutes, uOttawa, and the outside world. There is a need to facilitate the process of internal cooperation, establish better connections with the Faculty's clinical departments, the research institutes and the hospitals, and set up mechanisms to exchange information on the science being done within the larger system. Collaborations with the institutes are hampered by institute goals and planning that differ from those of the Faculty. This has led to conflicts in the past. The core research departments have not focused in any niche areas, and there are few group grant submissions at a time when government funding agencies increasingly favor this kind of research. There are perceived challenges with the University's mandate and the research directions favored by the Faculty.

2. Credibility/Visibility and Community Awareness:

The research efforts of the Faculty of Medicine core departments lack visibility due to challenges in 'branding' (i.e. Faculty research disappears behind the more polished images of the institutes and hospitals). While tricouncil funding increases have leveled off, the Faculty is faced with stronger challenges by increased numbers of competitors for external funding every year, which is leading to decreasing success rates. As well, it is more difficult to secure funding for basic research in a political climate that puts increasing stress on applied research and practical outcomes. The Departments are not set up to aggressively promote an image of high quality research to the outside in order to attract high quality PIs, PDFs and graduate students, nor do they understand how to influence the government's political priorities. Faculty efforts in this area also fall short of what is believed to be needed. In short, the Departments are not succeeding in selling themselves nor in promoting their interests to the outside community.

3. Enhancing Quality: Students; Academic; Research

First class (scholarship) students are challenging to recruit given the University's modest reputation in research and the intense competition from other universities in Canada and the U.S. The number of students continues to climb, but the perception is that those of high caliber who are going into research seldom have uOttawa as their first choice.

Part of the problem appears to be systemic, with the Faculty, Departments and Graduate programs failing to create a welcoming environment for newcomers. Within the research departments, there is little feeling of community, which does not encourage

scientists to work together in group projects or get to know the broader aspects of the Faculty's research programs. This in turn puts the Departments at a disadvantage in applying for group research funding such as that from CFI, Genome Canada, CIHR's strategic grants, NSERC cooperative grants, and so on.

The Departments have not developed to the extent needed niche areas of strength upon which to attract funding, high quality staff, or the best students.

4. Academic Autonomy in a Commercial/Applied Environment:

Academic freedom and the autonomy to pursue curiosity-oriented research are under increasing threat from politically-driven emphasis on the practical outcomes of science. This translates into increasing difficulty in securing funding for basic research, with more and more federal and provincial research funding being earmarked for large strategic programs that require direction and practical benefits.

5. Managing Efficiently:

There are many problems of management within the Faculty, such as a chaotic data handling system, dearth of collaborative projects, lack of an incentives system, little accountability, and continual uncertainty in funding. There is a need to address issues such as, infrastructure stress (must rationalize needs, adopt shared programs), requirements for larger support staff, strategy on research foci (competitive niches, or not), the high administrative burden of PIs, a disorganized approach to provincial and other outside funding sources, and lack of political influence or priorities. There is a perceived disconnect between the objectives and mandate of uOttawa and the Faculty of Medicine, and within the Faculty the core departments have little influence over the Faculty's policies and directions. The social environment is arid, with little feeling of community.

C. Strategic Directions:

The University of Ottawa Faculty of Medicine's research function operates in an international milieu that is highly competitive for resources, including research infrastructure and operating funds, quality academic and administrative staff, and the very best students. To optimize its position in this competition, the research staff have formulated five interlocking strategic directions, one from each of the key issues distilled from the earlier scan of health research trends. Each of these directions is based on a goal or intention statement derived from the issues, followed by an action plan and expected results over the next three years.

Strategy # 1: Build better collaborations and stronger linkages internally and external to core research function.

Problem

There is a lack of communication and collaboration within the departments, and between the Departments and the remainder of the Faculty, the university and the outside

world. The challenge is especially acute within the "wet" research departments, and less so with outside institutions. There is a perceived lack of innovative spirit and competitiveness for external funding in the core research departments. A sense collegiality and pride in research, evidenced by an atmosphere of intense scientific debate, discussion, and sharing is felt to be largely lacking within the core "wet bench" research departments.

Intent

To create a stimulating intellectual environment in the core research departments, and promote the sharing of ideas, resources and infrastructure, and develop formal mentoring of students and new PIs. To raise the level of innovative science, enhance competitiveness and increase recognition of the Faculty's research excellence through new atmosphere of cooperation and community.

Process

Move to establish multidisciplinary research teams that cross departmental boundaries and put in place a teaching support system in which guest lecturers are brought in to teach specialty techniques, processes. Create social venues (lounge area with coffee/snacks) where scientists can meet easily to socialize and discuss their research as part of a daily routine. Set up seminars and workshops to present results on a regular basis (where they become part of normal work schedules). Create an e-mail resource list of instruments and expertise in the Faculty to encourage sharing among PIs, and bring together shared research facility platform (where feasible). Support the hiring of a strong leaders who will affect a balance between top-down and bottom-up approaches to decision making.

Results

At the end of three years, the scientific 'value system' is changed to support team-driven research projects as well as individual PI-driven projects. There is a 'Community of Scholars' atmosphere in the departments and a club with informal meetings of PIs, PDFs and graduate students featuring no-holds-barred discussions/arguments about research, the political issues surrounding science and so on.

Strategy # 2: Build credibility, visibility and community awareness of the core research function.

Problem

The Faculty core departments do not enjoy the reputation for research excellence that they deserve. The quality of science within the core is better than what it is recognized for. This is believed to be partly due to the high visibility provided to Research within the Faculties affliated Research Institutes and hospitals. The latter have dedicated communications staff to promote this visibility. In turn, this low uOttawa

visibility influences public opinion, which translates into lack of support for funding. This low visibility also affects reputation, which impacts on the Faculty's efforts to attract high quality PIs, PDFs and graduate students.

Intent

To improve the visibility of the core departments, and with this the credibility and reputation of the research effort, which will attract high quality scientists and students and develop a sense of community. To improve communications within and among the core departments, the Medical Faculty, uOttawa, and the larger community.

Process

Collect comprehensive statistics on the staff (PIs, students, PDFs), their research, grant and laboratory successes, and publications to create a comprehensive picture of the Faculty research efforts. Send this unified message outside to the scientific, business, government and broader lay communities. Develop a policy to ensure that PIs, PDFs, and students in the institutes who are affiliated with the Faculty advertise this fact when describing themselves at meetings, in publications, and press conferences. Hire a full-time communications officer to drive this process, to make the outside contacts with the media and other communications people in the institutes, ensuring that the Faculty's profile and successes are widely advertised.

Results

At the end of three years, there is: a Faculty Annual Report; a database that is reliable and accessible (with restrictions) containing information on the research and the PIs (common CV format); and a regular procedure for tracking the increase in exposure of identified Faculty research in the press, radio, television and the internet. Scientists in the core departments are recognized as being an integral part of the Ottawa biosciences and medical research community. Journalistic abbreviations such as 'Ottawa medical scientists .." are translated in the public mind as 'University of Ottawa scientists.'

Strategy # 3: Enhance the quality of graduate students, academic programs and basic science research.

Problem

1. Students: The recruitment of first class (scholarship) students is difficult given uOttawa's modest reputation in research. uOttawa is rarely the first choice of students in the highest percentiles, because of low 'name' recognition of uOttawa in medical science (perhaps due to an ineffective external recruitment strategy). Currently, 80% of students in our graduate programs are recruited from our own graduate programs. Students are unaware of the different opportunities in our undergraduate program (the best students are distributed non-uniformly across departments), which could limit their potential.
2. Academic: One of the biggest issues here is a "lack of community" and "collegiality", both within and across the departments. The sense of belonging for PIs and students so crucial to productivity is absent. Undergraduates trained at uOttawa were perceived not

to be well prepared for doing research (not fully exposed to latest developments and techniques in biosciences), resulting in low research productivity during the first years of graduate studies. The number of undergraduate courses in French is unacceptably low.
3. Research: UOttawa does not have a strong research profile, limiting its ability to attract funding, high quality staff, and the best students. Collaborations on group research projects are not encouraged, disadvantaging uOttawa in the competition for group research funding (CFI, Genome Canada, the CIHR's strategic grants, NSERC cooperative grants). Significant research grant resources are wasted due to duplication of equipment and lack of common core facilities. PIs lack support, both administrative (e.g. secretarial) and infrastructural (limited/outdated office spaces, furniture, *etc.*).

Intent:

To raise the quality and productivity of the research and teaching functions in the basic science departments by implementing processes that improve: our academic programs; the recruitment of highly qualified graduate students; our public and academic image; our research infrastructure and support; the administrative support and internal communications; and the amount of collaborative research and number of group grants.

Process:

Improve academic programs: Increase undergraduate student quality and their exposure to research by creating a Life Sciences B.Sc. with different streams (Biochem., Neuro, Immuno, Virol., Cell. Mol. Physio., Growth & Develop., Sysbio., *etc*) and link these seamlessly to graduate programs. In this program, 1st and 2nd year to be general courses, taught by professional lecturers, with 3rd and 4th year increasingly specialized. Year 4 courses to be purely research based and taught by PIs doing research in area.
Improve recruitment of graduate students: Fund visits for top graduate-student applicants, faculty-sponsored outreach programs, including PI visits to other institutions/conferences. Advertise the University (scholarly excellence) and the unique environment of Ottawa (fresh air, greenery, bi-cultural, safe).
Increase number of collaborative research projects: Restructure the departments or amalgamate them, followed by formation of research themes or groups to facilitate increased collaboration and group grant successes (the current department structures have no research focus and are not amenable to forming research groups.).
Improve research infrastructure and support: PIs to associate with graduate programs and undergraduate streams rather than departments. Each research stream to have secretarial support. Establish and increase the number of core facilities with dedicated technical staffs. All existing infrastructure facilities (at the Faculty, CHEO, OHRI, *etc.*) to be accessible to Basic Science Departments. Tuition exemptions to be awarded to graduate students with an A- average (currently, a significant portion of grant funding is used to pay tuition and not available for research needs).
Improve administrative support and internal communications: Mandated interdepartmental committees to coordinate graduate recruitment, academic programs, research (e.g. bringing PIs together in group projects), infrastructure and seminars. Create faculty-wide, one-stop-shop, web-based seminar/events calendar, as well as a grants and

opportunities bulletin board. Increase the number of interdepartmental seminars and works-in-progress that feature internal speakers (PIs/post-docs).
Improve public and academic image: Celebrate scientific achievements internally to foster an atmosphere of research and academic excellence**.** Fund international conferences and workshops. Seek higher exposure in the press.

Results:

At the end of three years: a majority of graduate students (75%) receive funding from external sources; half of all graduate students come from outside uOttawa; a third of all PI funding come from group grants (CFI, NSERC strategic grants, Genome Canada, etc.); all 1st and 2nd year courses are taught by professional lecturers; 3rd year a mix and all 4th year courses targeted towards research (i.e. PIs doing the teaching); do more with less (i.e. double the external research funding and triple the research output.

Strategy # 4: Maintain academic autonomy in current trend towards commercialized science research.

Problem

The trend is towards less money for unfettered curiosity-oriented research, and a shift to research that is 'translatable', directed towards proof-of-concept and later commercial stages of development. This direction comes from government and has resulted in policy re-alignments in granting agencies and the creation of strategic funding agencies (Genome Canada, CFI, ORF, CIHR RFAs) aimed at practical outcomes ('Benefits to Canadians'). Researchers are increasingly required to sign non-disclosure agreements with outside partners, restricting publication and the flow of research information. The option to do pure research appears to be narrowing.

Intent

To promote and preserve academic freedom in research.

Process

Commit strongly to basic research through assertions at senior faculty levels and faculty/department support at project levels. The faculty will negotiate for basic research funding in lobbying efforts with opinion leaders in industry, government and academia. Adapt to the current funding environment with its increased commercial emphasis, but continue to seek 'no-strings' research funding. Move within and between departments and across the Faculty to link basic and applied research into teams with mutual interests, in which the basic work is protected through its relevance to the 'downstream applied aspects of the research (note that even pharma companies carry out fundamental studies on drug action). Commit to a basic science departments mandate of promoting curiosity-driven research and to valuing research without obvious commercial application.

Results

At the end of three years, there is an improved understanding and increased recognition of the value of curiosity-driven research. The earlier balance between basic and applied research has been re-established.

Strategy # 5: Manage the core research function efficiently.

Problem

The Faculty with respect to the core Departments is ineffective at three levels of resource management:

Human: artificial department boundaries do not promote and maximize potential strengths by fostering interactions and group activities (the way the basic science Departments are organized). This has halted the development of a sense of belonging. There is apathy in the Faculty, with little momentum or participation among members.

Financial: insufficient funds to meet increasing demands for teaching, research, infrastructure, and to maintain a competitive research environment. Individual Departmental budgets have not increased, even decreased.

Infrastructure: insufficient in core research departments. Lack of coordinated planning has led to duplication of equipment and insufficient funds/personnel to run the infrastructure.

Intent

Human: to achieve the most efficient distribution of human resources across the core departments in order to increase research, optimize use of materials; attract new funding, raise research profile, and increase competitiveness and productivity of the research function. To create a sense of belonging, thereby improving cohesiveness and raising pride.

Financial: to develop and carry out a cohesive strategy for increasing research funding from internal (Faculty, uOttawa) and external sources, and achieve financial transparency in operations.

Infrastructure: to acquire sufficient quantity of high quality equipment and support personnel to support high quality, internationally recognized research.

Process

Human: initiate discussions on creating a single academic unit from existing departments of BMI, CMM, PLM and EPI. Realign along scientific strengths to form research groups. Set up an international search process for a recognized scientist to be the new chair and champion, and identify leaders for research groups. Group PIs with common interests, level of dedication, and bring in new PIs (CRCs).

Financial: New academinc unit to have a say in budgetary decisions. With restructuring negotiate budget increase that will allow the new academic unit to achieve its mandate and for PIs to fulfill new responsibilities. Leverage Funds for greater access

to internal and external sources (e.g. for endowed Chairs). Increase the number of focused group grants submissions.

Infrastructure: Research groups to apply for new common research infrastructure and personnel.

Results

At the end of three years, there will be a single research institute resulting from the merging of CMM/BMI/PLM, led by a scientist administrator with international credentials. The research will be aligned along core strengths into new groups headed by scientific leaders. This better, more efficient organization will be measured by targets that include increased numbers of new PIs, funding increases from group grants expected from the new group organization(CFIs, CIHR RFAs, NSERC group and strategic grants), funding increases from the faculty and uOttawa, and a system of common research infrastructure serving the needs of all PIs and staffed by permanent personnel. Ultimately, the success of all this change will be measured by research productivity in terms of publications in science journals.

Summary

At the end of three years:

- ***the scientific 'value system' is changed to support team-driven research projects as well as individual PI-driven projects. There is a 'Community of Scholars' atmosphere in the departments and a club with informal meetings of PIs, PDFs and graduate students featuring no-holds-barred discussions/arguments about research, the political issues surrounding science and so on.***

- ***there is: a Faculty Annual Report; a database that is reliable and accessible (with restrictions) containing information on the research and the PIs (common CV format); and a regular procedure for tracking the increase in exposure of identified Faculty research in the press, radio, television and the internet. Scientists in the core departments are recognized as being an integral part of the Ottawa biosciences and medical research community. Journalistic abbreviations such as 'Ottawa medical scientists .." are translated in the public mind as 'University of Ottawa scientists.'***

- ***a majority of graduate students (75%) receive funding from external sources; half of all graduate students come from outside uOttawa; a third of all PI funding come from group grants (CFI, NSERC strategic grants, Genome Canada, etc.); all 1st and 2nd year courses are taught by professional lecturers; 3rd year a mix and all 4th year courses targeted towards research (i.e. PIs doing the teaching); do more with less (i.e. double the external research funding and triple the research output.***

- ***there is an improved understanding and increased recognition of the value of curiosity-driven research. The earlier balance between basic and applied research has been re-established.***

- ***there is a single research institute resulting from the merging of CMM/BMI/PLM/EPI, led by a scientist administrator with international credentials. The research will be aligned along core strengths into new groups headed by scientific leaders. This better, more efficient organization will be measured by targets that include increased numbers of new PIs, funding increases from group grants expected from the new group organization(CFIs, CIHR RFAs, NSERC group and strategic grants), funding increases from the faculty and uOttawa, and a system of common research infrastructure serving the needs of all PIs and staffed by permanent personnel. Ultimately, the success of all this change will be measured by research productivity in terms of publications in science journals.***