1. Summary of Proposed Research

Learning in a Hospital: Network Coordination and Biotechnology Innovation

University hospitals often are at the centre of biotechnology innovation (including health technologies). This is so because they bring together actors who have different expertise and a variety of ideas. A meeting place for diversified actors, such as provided by university hospitals, is essential for innovation because it enables the coordination of various expertise and ideas. Actors with distinctive expertise and ideas, however, might have difficulty working together. Distinctive expertise and ideas cannot always be reconciled and when such is the case, conflicts among actors become prominent. Naturally, conflicts among actors curtail the innovation potential of university hospitals, even if they provide a meeting place for diversified and potentially complementary actors.

The objective of this research is to better understand the capacity of diversified actors to work together behind innovation. The literature on national innovation systems insists on the importance of networks connecting a wide range of actors, suggesting that narrow networks fail at bringing together the complementary expertise and the original ideas necessary for innovation. This literature, however, is structure-oriented, insisting mostly on differences in network configuration and their incidence for innovation. This research will complement the national innovation system literature with an approach that accords more importance to the actors. Not only will the research account for the configuration of networks, it will also study the extent to which actors can work together toward producing innovation. The research will draw from the literature on policy learning, specifically the advocacy coalition framework and the actor network approach, hypotheses on actors' capacity to work together. These two perspectives agree that coordinating a wide diversity of actors, who possess complementary resources but also divergent ideas, requires learning. Without learning, actor coordination can only be limited and innovation compromised. The advocacy coalition framework provides intriguing hypotheses on the difficulties of learning. In contrast, the actor network approach proposes equally intriguing hypotheses about learning possibilities within wide scope networks. This research will test these competing hypotheses in view of contributing to the literature on national innovation systems and to a better understanding of the practice of innovation.

The test will be performed with a study of 15 to 20 university hospitals, which make key contributions to national innovation systems in North America, Europe and Asia. In line with the preferred method of most studies of national innovation systems, the research will begin with an in-depth case study of three university hospitals located on different continents. These case studies will provide a better understanding of the various contexts within which university hospitals operate. Methodologically departing from conventional studies of national innovation systems, this research will comprise a Qualitative Comparative Analysis, which is an innovative instrument situated between case studies and quantitative analyses. The Qualitative Comparative Analysis will be used to study the advisory committees and boards of university hospitals, in which network actors participate. The purpose of the Qualitative Comparative Analysis will be to provide a better understanding of the network configurations associated with different degrees of innovation success. Also departing from conventional studies of national innovation systems will be a web survey of the actors participating on advisory boards and committees. Surveys are one of the key instruments policy scholars use to study learning.

Three graduate students will be closely associated with this research. The research will be highly relevant for their training. Besides becoming familiar with the literature on national innovation systems and on policy learning, students will be involved in qualitative and quantitative data collection and analysis. This experience will sharpen their research skills.

2. Detailed Description

Objectives

The purpose of this study is to contribute to the understanding of innovation, biotechnology innovation in particular, as it occurs in university hospitals. Scientifically advanced countries endeavour to create environments conducive to innovation, understood as the creation of socially acceptable scientific knowledge capable of sustaining economic growth. Several of these countries have adopted policies to reassure citizens who have ethical concerns with scientific advances, they have allocated money to improve research infrastructures, notably university hospitals, and they have increased research funding (Montpetit et al. 2007). Despite favourable policy environments, innovative projects often fail to take off in a timely fashion. Why? The literature on National Innovation Systems (NIS) insist on policy and structural factors: some countries fail because they do not have institutions enabling the development of networks comprising universities, industry, capital, state and various other stakeholders (referred to bellow as wide scope networks). In contrast, complementary resources, ideas and expertise would come into interaction in countries where wide scope networks exist, breading innovation (Edquist 1997; Owen-Smith et al. 2002; Balzat et al. 2004; Lee et al. 2007). Few scholars have approached the question of innovation success and failure from an actor-centred perspective, however, asking whether researchers, industry, banks, governments and other stakeholders are able to work effectively together in view of realising innovation. While the absence or presence of wide scope networks affect innovation, the capacity of network actors to work together is neglected in the literature. Therefore, *this study will investigate the extent to which actors with wide expertise and a diversity of ideas can coordinate their efforts behind innovation.* The investigation will proceed through a comparison of university hospitals in North America, Europe and Asia.

Context

With a prosperous pharmaceutical industry, Montreal is one of the leading Canadian cities in biotechnology (biotechnology here includes all health technology). The city's success in this sector of the knowledge economy surely rests on an adequate policy environment. Montreal's biotechnology edge, however, depends also on two reputed university hospitals: the Centre hospitalier de l'Université de Montréal (CHUM) and McGill University Health Centre (MUHC). University hospitals are the production sites of innovative biotechnology knowledge, appropriate for transfer to industry (Thorsteinsdòttir et al. 2004: 49). Montreal's university hospitals, unfortunately, are confronted with serious difficulties: governments, university administrations, professional research associations, industry groups and local communities have been discussing restructuring and new infrastructure projects for more then ten years and progress has been too slow to update research facilities to international standards. Discussions among these actors, who disagree over what these university hospitals should be, have often halted progress in the past ten years. Meanwhile, university hospitals elsewhere in the world kept investing in their infrastructures and human capital, attracting reputed researchers and catching up on Montreal's biotechnology cutting edge. Why do discussions over university hospitals in several places in the world encourage innovation, while discussions in places like Montreal slow it down? Does the innovation success and failure rest with differences in the constellation of actors, the scope of the network they form, or with their individual capacity to work together despite their differences of view?

Relevant literature: The few social science studies of university hospitals were realised within the perspective of NIS (Thorsteinsdòttir et al. 2004: 49; Owen-Smith et al. 2002). A NIS is a network configuration of institutions and actors participating in the development of innovations within a given country. Early NIS studies focused on innovation at the national level, but more recent research insists on local networks (also known as clusters) within large decentralised countries (Owen-Smith et al. 2002), as well as on the international network connections of national actors (Taylor 2007). The purpose of the literature on NIS is to understand which configurations of policies, institutions and networks are most conducive to innovation. For some particular sectors, such as biotechnology, university hospitals are often at the centre of innovative network configurations. University hospitals can be the meeting

places of the members of NIS. When they provide adequate research infrastructures, university hospitals attract reputed researchers. Industry and capital meets these researchers when they invest in their centres and laboratories. University hospitals organise conferences and meetings bringing together scholars of various fields, including specialists in bioethics and in the social sciences. Representatives of the governments, local communities and actors interested in biotechnology and health technology development participate on the various advisory boards or committees of university hospitals.

The literature on NIS has not identified a single network configuration conducive to innovation (Taylor 2007). In fact, this literature rejects the idea of a one best way (Thorsteinsdòttir et al. 2004: 49). Innovation would be territorially and historically contingent (Balzat et al. 2004). Nevertheless, innovation failures in this literature are associated frequently with narrow network configurations. Places and periods of failures are most of the time related to network configurations bringing together too narrow a scope of actors. These networks were frequently missing actors whose material resources, expertise, ideas or legitimacy are essential for innovation. Network scope, however, cannot be a sufficient condition for successful innovation. In Montreal, for example, university hospitals seem to offer effective meeting places for a wide scope of actors with complementary resources, expertise and legitimacy. The problem appears to rest on the capacity of these actors to engage effectively in discussions in view of agreeing on innovative projects.

This study begins with the theoretical insights provided by the NIS literature. In other words, the capacity of university hospitals to provide meeting places for a wide network of actors will be an important control variable in this study. However, the main focus of this research is the capacity of actors who belong to wide scope networks to work together in coordinating their efforts behind innovative projects. On this matter, the literature on policy learning will be useful. In fact, this literature suggests that coordination in wide scope networks can only be achieved through learning (Sabatier et al. 2001). Jenkins-Smith et al. (1993: 42) define policy learning as "relatively enduring alterations of thought … concerned with the attainment or revision of the precepts of the belief system of individuals." To the extent an innovative project requires the agreement of several diverse actors, such as in a successful NIS, learning is essential. Refusal on the part of actors to revise their thoughts and beliefs can only result in a failure to coordinate efforts and in obstruction to innovation. Knowledge on the capacity of actors to learn should therefore make a useful contribution to the literature on NIS.

The advocacy coalition framework (ACF) has produced pioneering work on policy learning (Sabatier et al. 1993; 1999) and is increasingly turning to coordination capacity (Leach et al. 2005; Wieible et al. 2005). Interestingly enough, the ACF's predictions regarding learning within wide scope networks are bleak. At any given time, the ACF predicts, learning rarely reaches deeply into actors' belief systems, defined as the hierarchical and logical organisation of beliefs. Learning mostly alters beliefs located at the margin of actors' belief systems. According to the ACF, the types of changes in actors' belief systems required for coordinating efforts behind an innovative project occur only under a set of restrictive conditions. Thanks to their cognitive limitations, actors ally and oppose each other as a function of the distance between the beliefs at the core of their beliefs systems. In other words, actors surrounding a university hospital are likely to be reluctant allying with the entire network, preferring close association only with actors who share their core beliefs regarding the nature of innovative projects. Sabatier et al. (1993; 1999) call "advocacy coalitions" these narrow networks. The realization of the core beliefs of any given advocacy coalition would always be made difficult by the presence of competing advocacy coalitions. In fact, the ACF suggests that any subsystem (a university hospital can be treated as a subsystem) is likely to be characterized by the presence of at least two competing coalitions. The learning limitations predicted by the ACF are related to the opposition dynamics of advocacy coalitions. Leach et al. (2005) explain that individuals involved in policy subsystems weigh more heavily the costs than the benefits associated with the actions of their opponents. This "devilshift", they argue, accentuates the distance between potentially complementary actors. Distant, actors of competing coalitions would distrust each other and rarely interact directly. In turn, the scarcity of

interactions between actors who hold distinctive core beliefs would reduce the possibilities of any significant learning, coordination and innovation (Jenkins-Smith et al. 1993: 48). Weible et al. (2005), however, show that actors can learn from tractable information (mostly scientific information), obtained from actors in adversary coalitions, when they interact for information, as opposed to when they interact for coordination. In other words, the ACF would predict successful innovation only when network actors are curious and know little limits when it comes to seeking scientific information.

The Actor Network Approach (ANA) is more optimistic about policy learning (Marsh et al. 2000; Marsh 1998; Toke et al. 2003; Rhodes 1997). Rejecting the ACF's devilshift, the ANA emphasises cooperation more than competition (Schneider et al. 2007). In contrast with the ACF, the ANA predicts networks involving a wide diversity of actors trying to cooperate. Actors, the ACF assumes, ally instrumentally in view of realizing their core beliefs. The ANA does consider the possibility that actors also join networks for non-instrumental reasons. When they do so, they learn significantly. Interest in cooperation within wide scope networks may vary along the particular legitimacy concerns of different groups of actors (Robinson 2006: 596). Government actors, for example, are likely to worry about their legitimacy and seek association with a wide network to avoid perception of capture by special interests (Lertzman et al. 1996:127; Toke et al. 2003; Salter et al. 2006). Carpenter (2001) even argues that administrative actors, university hospital administrators for instance, when they participate in wide and diversified networks and learn from this participation, gain credibility and influence over time. The deliberative ethics of some actors may encourage them to join wide scope networks. A deliberative ethics values exchange of ideas and debates over a wide range of policy perspectives (Cohen 1997). Actors with such an ethics will generally hold positive views of wide scope networks, considering them as normal in democracy and useful in the search of policy ideas (Mansbridge 2003; Risse 2000; Schön et al. 1994). In short, in networks where actors share a deliberative ethics, learning, coordination and innovation occur more often than predicted by the ACF.

In short, the ACF and the ANA provide several hypotheses upon which this study will rest. The goal will be to draw from these literatures in view of adding to existing knowledge on NIS.

Relationship with Ongoing Research: Thanks to grants from SSHRC, I spent the past seven years conducting research on biotechnology policy development at the national and supranational levels in North American and in Europe. Throughout this research, I familiarized myself with the scientific and organisational aspects of the complex issues of genetic engineering in the agri-food sector and human genetics (Montpetit forthcoming; Montpetit 2005; Montpetit et al. forthcoming; Montpetit et al. 2007; Montpetit et al. 2005). Given the time and resources that I have invested in this endeavour, it is worthwhile building on this knowledge of biotechnology for this new program. This knowledge of biotechnology will be particularly useful for the preparation of a survey that I discuss bellow. In addition, the comparative research that I have conducted on biotechnology policy has enabled me to develop fruitful collaborations with international scholars. Several of my recent publications result from it (e.g. Montpetit et al. 2007), and this program will enable me to pursue these collaborations.

My ongoing research is concerned with the legitimacy of policy development in network environments (Montpetit 2003 and 2005). As indicated above, however, a favourable policy context is insufficient for biotechnology innovations, which rarely occur at the scale of an entire country. Rather, biotechnology innovations are site specific, occurring in a city or territory unlikely contiguous with that of an entire country. These observations are behind my decision to focus this new research on university hospitals. University hospitals play an important role in biotechnology innovation and they are site specific. My ongoing research focuses on North America and Europe. In the past few years, however, Asia has become an important continent for biotechnology innovation. Currently, it is difficult for a scholar in the area of biotechnology to ignore what is occurring on this continent; the policy and innovation literature is rich in information on Asian biotechnology developments (Wong 2005). Moreover, I was invited to give talks in Japan, China and Korea in the last 18 months. These trips were occasions to learn more about biotechnology development in these countries and to develop

relationships with Asian scholars. Scholars from Beijing Foreign Studies University, in particular, have offered me their help for this project. For these reasons, I believe that it is appropriate that I expand the territorial focus of my research by including Asian university hospitals.

Originality and Contribution: The originality and the contribution of this research can be understood in relation to its theoretical and practical implications. The practical implications are straightforward. The knowledge produced by this study will be useful to actors involved in university hospitals or any innovation projects. This study should provide them with a better understanding of the conditions under which innovation occurs. In the context of the knowledge economy, in which growth rests on innovation, understanding these conditions is important, notably for Canada where preserving a competitive advantage will be challenging given the rise of Asian countries. Awareness of these conditions can convince some actors to change their attitude. In addition, the institutionalisation of advisory committees in university hospitals and other innovation-centred organisations should benefit from the knowledge produced by this research. The theoretical contribution of this research rests on its combination of relatively isolated theoretical approaches. As indicated above, the literature on NIS insists on the structure of successful network configurations. The scope of networks appears particularly important. In contrast, the literature on policy learning has focused on policy-making actors, but has paid little attention to innovation projects in science and technology. However, this latter literature has produced significant knowledge on the capacity of actors to coordinate their respective policy efforts. Therefore, the literature on policy learning may be useful to understand the success or failure of wide scope networks. I believe that knowledge on policy learning can be fruitfully combined with NIS knowledge to better understand innovation.

Methodology

Strategy: The study will begin with the identification of between 15 and 20 university hospitals located in North America, Europe and Asia. The list will include university hospitals differentiated by their degrees of success in producing biotechnology innovations. The idea here is not to produce an original ranking of university hospitals, but to maximise the probability of relevant variations among the cases in the sample. If two university hospitals experience significantly different innovation success, they are also likely to vary in terms of network scope and actor capacity to learn. Therefore, I will not propose any new method to measure success, but rely on the existing scholarly literature, notably on NIS, to identify between 15 and 20 variously successful university hospitals (Cortright et al. 2002; Edquist 1997; Owen-Smith et al. 2002). This literature often uses analyses of patents to measure success. Again in view of maximising variations, I will rely also on rankings published in professional biotechnology publications and OECD documents (van Beuzekom et al. 2006).

I plan conducting three in-depth case studies of university hospitals, one on each of the three continents covered by this study. Montreal is an obvious choice, but also Geneva and Shanghai. Geneva and Shanghai also are important cities for biotechnology. Moreover, Frédéric Varone, a colleague from the University of Geneva with whom I have been collaborating for several years, can be of precious help. A student from Beijing Foreign Studies University can help me with the case of Shanghai. For each of the three cases, I will conduct 5 to 10 semi-directed interviews with university hospitals managers, researchers and other stakeholders. The main purpose of these case studies will be to familiarise myself sufficiently with the functioning and the issues facing university hospitals to prepare a survey questionnaire. These in-depth case studies will also provide occasions to interviewees to explain at length their views on the scope of the networks supporting innovation and on the capacity of actors to learn in view of coordinating their efforts. The interviews will be fully transcribed and their content will be coded so as to retrieve relevant citations rapidly.

Data on variables such as size, budget and policy environment will be collected for each of the 15 to 20 institutions of my list. More importantly, I will collect information on the composition and activities of the advisory boards and committees (including ethics committees) of each of the 15 to 20 university hospitals. As a reminder, university hospitals are often the meeting places of NIS network

actors, meetings concretely occurring on boards and committees. In other words, a study of advisory boards and committees of university hospitals can reveal differences in network configurations, including network scope. Annual reports and official documents will be the main source of information on boards and committees, but I will also identify a reliable informant in each institution to fill in the gaps. This information on university hospitals and their boards will be organised in a data set to perform a Qualitative Comparative Analysis (QCA), explained at length bellow.

While collecting information on advisory boards, a special attention will be given to the contact information of their members. Contact information will be used to conduct a web survey of board members. Surveys are commonly used to study learning and in particular the propensity of actors to alter their thoughts and their related capacity to coordinate their efforts behind a project. Sabatier and his colleagues have conducted surveys of actors on watershed management boards and these surveys provide a wealth of questions, which I will use in the preparation of my own survey. Moreover, my knowledge of biotechnology, acquired in my past research, as well as the in-depth case studies, will allow me to adapt these questions to the context of university hospitals. My last SSHRC grant was used to prepare a comparative web survey of biotechnology policy-making actors. This research will benefit from this experience.

The in-depth case studies, the Qualitative Comparative Analysis of advisory boards and the web survey of their members will be challenging particularly for Asian university hospitals. To manage this challenge effectively, I will limit the number of cases from this continent to no more than four. As mentioned above, however, I will be able to count on the collaboration of Asian colleagues. I spent three weeks in the spring of 2007 at Beijing Foreign Studies University and I discussed at length this project with some professors. The director of the French department, M. Fu Rong, and the coordinator of the centre for Quebec studies, Ms. Hongfeng Li, agreed to help me find a student capable of assisting me in the collection of information on Asian university hospitals. Beijing Foreign Studies University emphasises the teaching of foreign languages and as a result a large number of students speak French, English and other Asian languages, potentially useful to understand documents and translate surveys for Asian university hospitals. Moreover, my department hired a professor of Chinese origin last year, Zhiming Chen, who has a degree from Beijing Foreign Studies University. He will be of precious assistance to overcome the difficulties I may encounter in communicating with Asian university hospitals.

Naturally, the questionnaires for the web survey and the semi-directed interviews will be subjected to a close examination by the ethics committee of the Université de Montréal. The three in-depth case studies will be completed within the first year of this research. The collection of data for the QCA should be completed at the end of the second year. The questionnaire for the web survey will be prepared once the in-depth case studies are completed. All contact information will be organised in a data base before the end of the second year of the project and the survey will be administered during the first six months of the third year of the project. I have considerable experience with in-depth case studies, QCA, and web-based surveys and therefore I am confident that I have the capacity to complete this research within the three years of the program.

Instruments: This study seeks (1) a better understanding of the network configurations surrounding university hospitals and (2) of the capacity of network actors to work together. As alluded to above, the first objective will be met, thank to a QCA. A web survey will allow me to meet the second objective. Below, I present these two instruments.

A QCA seeks to identify patterns of multiple conjunctures and is particularly well-suited for small-N research designs (Ragin 1987; De Meur et al. 2002). The purpose of the QCA method is to "…integrate the best features of the case-oriented approach with the best features of the variable-oriented approach" (Ragin 1987: 84). In fact, the QCA possesses some of the key strengths of qualitative research, namely seeking holistic and case-sensitive qualities (De Meur et al. 2002: 20). The method considers that each individual case can require a specific explanation. The method thus employs a

complex conception of causality. That is to say that the combination of conditions is more important than the individual conditions in the explanation of an output, successful innovation in this case. This is particularly useful in network analysis, often criticized for its focus on independent network characteristics rather than on the network as a whole (see Dowding 1996 and 2001). The QCA also shares some of the key strengths of quantitative methods (De Meur et al. 2002: 20). The QCA allows for the analysis of more than simply a few cases and can thereby produce limited generalizations. Moreover, it relies on formal tools, namely Boolean algebra, which allows one to identify 'causal regularities' that are parsimonious, combining only a few minimum conditions. QCAs are replicable, enabling other researchers to corroborate or to falsify results.

The process of the QCA begins with the production of a raw data table in which cases are summarized as combinations of conditions (notably aspects of network configurations such as scope), expressed in 0 or 1 values, related to an output (successful innovation in this study), also expressed in 0 or 1 values. The production of the raw data table will be achieved using the information collected on the 15 to 20 university hospitals and their advisory boards. From the raw data, a software (fs/QCA) generates a "truth table". The truth table will reveal, in a rough manner, the configuration of conditions associated with the variation in the success observed across university hospitals. The next step of the analysis is Boolean minimization. Here the QCA software reduces the long Boolean expression, which is a full description of the truth table, into shorter expressions, the so-called "minimal equations". The minimal equations reveal regularities, in the form of a configuration of conditions, notably network configurations, most frequently associated with outputs. Equations account also for the absence of given conditions in the production of outputs. I used the QCA in my past research and I found it very useful, especially for network studies (see Montpetit et al. 2007; Varone et al. 2006).

The learning capacity of network actors will be assessed with a web survey. Survey questions will be consistent with those of surveys used by reputed scholars studying policy learning (Leach et al. 2005; Wieible et al. 2005). These scholars, however, have relied on mailed surveys. A web-based survey is particularly appropriate here given the comparative nature of this research and the professional status of respondents. Web surveys can also be sent by mail to respondents who prefer paper. Web surveys can easily be retrieved by respondents and, unlike telephone surveys, can be fill out at respondents' convenience. This is not a small advantage for this research given the professional responsibilities of respondents. The cost of web surveys is relatively low and email reminders can be sent frequently at no cost. Web surveys include frequently large space for additional comments and respondents to web surveys indeed provide more qualitative information than respondents to mail survey. In addition to these benefits, the literature on web surveys identifies some difficulties, such as anti-spam softwares that screen out invitations to participate emailed to respondents (Couper 2000; Couper et al. 2001; Cook et al. 2000; Fricker et al. 2005). The web survey of biotechnology policy-making actors that I conducted with my last SSHRC grant convinced me that these difficulties can be overcome and are outweighed by the benefits of web surveys. In the last three years, I have developed a considerable expertise with web surveys and I intend to take full advantage of it for this research. When the survey will be completed, I will conduct standard multivariate regressions on the data (for an example see Montpetit 2007).

Communication of Results

I have participated in the various scholarly conferences and my books and articles were published by reputed university presses and journals. Among the journals in which I published are the *Journal of Public Policy*, the *Journal of European Public Policy*, *World Politics*, *Policy Sciences*, *Public Administration*, *Administration & Society*, *Governance*, the *European Journal of Political Research*, and *Comparative Political Studies*. I found these venues efficient to diffuse my research results among peers and I intend to keep publishing in such venues. On three occasions in the past two years, I was invited to present my research results, in an accessible manner, to civil servants and biotechnology stakeholders (see other research contributions in my CV). I found these venues to be efficient for the communication of my research's practical implications. I intend to seek actively invitations to such events in the future.

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4. Proposed student training and previous output

A. Description of the Research Team:
Not applicable.

B. Students Training:

During the three years of this program, I plan to hire two University of Montreal students, preferably one M.A. student and one Ph.D. student for ten hours a week, forty-five weeks a year. One additional M.A. student, from Beijing Foreign Studies University, will be hired ten hours a week during the first two years of the program. These jobs will provide graduate students with excellent training and steady financial support.

The first student, the M.A. student from the University of Montreal, will assist me in the collection of data for the QCA. At the beginning of the program, he or she will collaborate with the Ph.D. student in the preparation of the list of 15 to 20 university hospitals. This task involves a literature review about NIS, a search for rankings of university hospitals in professional biotechnology publications as well as an examination of OECD documents. Once the list is completed, the M.A. student will be responsible for filling out the QCA raw tables for each university hospital located in North America and Europe. This will involve going through the official documents of each institution. In several cases, it will also involve identifying an informant for each institution. Under my supervision, the student will be authorised to make contact with informants in order to obtain the missing data. These tasks will be excellent training for a M.A. student, as obtaining information from institutions spread out on two continents will contribute to the development of a sense of perseverance and initiative, two qualities valued by employers. Naturally, the student will be encouraged to use the collected information in his or her M.A. thesis.

The second student, a Ph.D. student from the University of Montreal, will first supervise and participate in the search for the 15 to 20 university hospitals. He or she will also participate actively in the preparation of the grid for the QCA raw tables. Therefore, it will be important for this student to familiarise himself or herself with the relevant NIS and policy learning literatures rapidly. Moreover, the Ph.D. student will follow closely the three in-depth case studies of university hospitals. He or she will be invited to assist to the interviews that I will conduct in Montreal. He or she will supervise the transcription of the interviews and he or she will code their content. This should prepare the Ph.D. student well for his or her main task: the supervision of the web survey. This task involves working closely with the M.A. student to make sure contact information for members of university hospitals advisory boards are adequately collected and organised in a manner suitable for the survey. It will involve also working closely with me over the formulation of the survey questions. This will require prior research of similar surveys. The student will also work with the private firm responsible for transposing the survey in a web format and managing the technological aspects. Lastly, the student will closely follow respondents to ensure an adequate response rate. These tasks will be excellent training in survey-type empirical research. The student will be given the possibility to use the data for his or her dissertation and will co-author articles reporting the results of this research. Several employers of graduating students highly prize experience with such quantitative empirical research.

The M.A. student located in Beijing will first conduct some preliminary research on Asian university hospitals to ascertain the feasibility of research for the 3 to 4 university-hospitals selected on this continent (ascertain the availability of documents). Once the Asian hospitals are selected, this student will perform tasks similar to those performed by the M.A. student located in Montreal, namely filling out the raw tables for the Asian hospitals. The M.A. student in Beijing will also be of precious help in the realisation of the in-depth Asian case study. He or she will help contact potential interviewees and he or she will accompany me during the interviews. If the interviews cannot be conducted in English, he or she will serve as interpreter and he or she will be responsible for transcribing

the interviews in English or French. Students at Beijing Foreign Studies University have considerable experience as interpreters and translators. This experience will be an occasion for a Chinese student to become familiar with the type of research we conduct in Canada.

With my past SSHRC grant I was able to hire two Ph.D. students, two M.A. students and one B.A. student. Thanks to the training and financial support made possible by this grant, the two Ph.D. students have completed their degrees a year ago. I have good reason to believe that the training in research they received though my last SSHRC program helped them find excellent jobs. One of them, Francis Garon, was hired as an assistant professor at York University, Glendon College. The other one, Isabelle Paré, was hired as policy analyst by Quebec's federation of general physicians. The two M.A. students are one the verge of completing their degrees. One of these two students, Catherine Pelletier, worked intensively on this program. She was indeed responsible for supervising a web survey of biotechnology policy-makers in four countries. She will be completing her M.A. this fall in preventive medicine at the Université de Montréal's medical school and I encourage her strongly to continue at the Ph.D. level. I decided also to associate a promising B.A. student, Rukmini Canape-Brunet, with my last SSHRC funded program. Stimulated by the program, she decided to pursue her studies at the graduate level, beginning a M.A. under my supervision in my department this fall. I plan to keep associating this student with my research.

C: Previous and Ongoing Research Results by Grants

SSHRC410-2005-1770: Managing Controversy in Biotechnology: Canada, the United States, France and the United Kingdom Compared

The key objective of this research was to contribute to the knowledge and practice of controversy management in the sector of biotechnology. Promising in matters as important as the improvement of human health, the provision of effective cures to terrible diseases, or the reduction of hunger, biotechnologies also raise environmental, humanistic and ethical concerns. Intractable biotechnology controversies have not only disturbed regular policy and administrative processes; they have arguably reduced the capacity of societies to refuse or accept biotechnologies and therefore avoid their risks or capture their potential. How have public officials managed biotechnology controversies so far? What can they do to increase the legitimacy of biotechnology policy and administrative decisions? This program was a test of two theories that provide answers to these questions: 1) policy transfer theory; 2) and deliberative theory. Using a web survey, the two theories were empirically tested in the areas of human genetics and agri-food biotechnology policy in Canada, the United States, France and the United Kingdom. The analysis of the results of the survey is still underway, with several articles and a book currently under preparation (see Montpetit 2007). I can however affirm that, unexpectedly, little evidence support policy transfer theory, even for European countries where transfers are allegedly frequent. Equally surprising is the evidence supporting deliberative theory, often depicted as idealistic. In the face of controversy, actors accept exposing their ideas to debates, hoping better ideas will emerge. Several caveats, however, apply, notably the limit to which actors accept all inclusive debates.

The program that I currently propose directly follows from this latter one. First, I was surprised to find evidence of deliberation. I expected actors to act in the strategic manner depicted by transfer theory. It then occurred to me that deliberation might be a source of legitimacy for citizens and actors who value debate for its own sake. Deliberation, however, may produce insufficient legitimacy for actors who seek policy results; actors who value output-oriented legitimacy, a concept coined by Scharpf (1997). In fact, deliberation may very well produce new policy ideas, but it may not end controversy. The opposite might even be true since the valued debates are well-served by controversy. I then became convinced that studying deliberation, while important, was insufficient; there was also a need to understand the extent to which deliberation produces learning and improve actor coordination behind a

project. This reasoning led me to pay attention to Paul Sabatier's recent work on learning and coordination, which inspired the proposed program.

2) SSHRC410-2001-0338: Le développement de politiques, les avancées scientifiques et les inquiétudes du public

This project was about biotechnology policy formulation in Canada, France, the United Kingdom and the United States. The objective was to better understand the interaction between scientists and representatives of NGOs in policy networks during the preparation of each country's major biotechnology legislations. During this project, I have shown that good will on the part of policy-makers drawing from wide knowledge during biotechnology policy development does not suffice to overcome the difficulties posed by the interaction between scientists and representatives of NGOs. In fact, I documented several examples when attempts to strike a compromise between scientists and representatives of NGOs led to delays, policy failures and delegation to administrative agencies. Thanks to this research, I published articles in reputed public policy journals and edited collections: *Policy Sciences; Swiss Political Science Review; Canadian Journal of Political Science; European Journal of Political Research; Comparative Political Studies; Canadian Public Policy*. A book, published by Lexington Press, also came out of this research in 2007 (Montpetit et al. 2007)

The ideas for the current research program are also related to this past project, which was concluded almost three years ago. The focus of this past project was on policy development and on policy failures at the national level (my last SSHRC also focused on the national level). While conducting the research, I realised that a lot was occurring at a more local level. In other words, policy failures and success at the national level was rarely the main reasons behind concrete biotechnology innovation success or failures. This observation led me to become increasingly interested by actor interactions at the local level, hence the focus of this current research program on university hospitals.

3) FQRSC 2002-NC-72634: Le développement de politiques, les avancées scientifiques et les inquiétudes du public

The project behind this grant is identical to the previous one. SSHRC funded 50% of it, FQRSC the other 50%.

4) FQRSC 2005-SE-96167: Politiques publiques et enjeux du développement social

As director of the Centre de recherche sur les politiques et le développement social (CPDS), I am the lead researcher for this team grant, devoted entirely to funding infrastructures. The grant is currently in renewal. Thanks to this grant, I will have office space within the CPDS for the two University of Montreal students that I plan to hire for the current research program. The CPDS provides students who work as research assistant an interesting social environment, particularly conducive to training and learning.

7. Budget Justification
Student Salaries and Benefits/Stipends

Doctorate: One (1) student, $16.64/hour, 10 hours a week for 30 weeks (fall and winter semesters) and 30 hours a week for 15 weeks (summer semester) for the three years of the program.
Duties: Conduct a web survey; assist in the preparation and coding of the semi-directed interviews; supervise the collection of data for the QCA.
Remuneration: Salary: $12480; Fringe Benefits (11%): $1372.80; Total (rounded): $13900 per year.

Masters: One (1) student, $15.00/hour, 10 hours a week for 45 weeks for the three years of the program.
Duties: Help prepare the list of university hospitals; collect data on North American and European university hospitals for the QCA; Learn to work with the QCA software.
Remuneration: Salary: $6750; Fringe Benefits (11%): $742.50; Total (rounded): $7500 per year.

Masters (in China): One (1) student, $15.00/hour, 10 hours a week for 45 weeks during the first two years of the program.
Duties: Help with the semi-directed interviews conducted in China; collect data on Asian university hospitals for the QCA.
Remuneration: Salary: $6750; Total (rounded): $7000 per year for the first two years.
Note: this person will be under a contract, which does not involve fringe benefits.

Travel and Subsistence Costs

Applicant

Travel to Switzerland: Ten (10) days in Geneva during the first year of the program.
Purpose: Conduct semi-directed interviews for the in-depth case study.
Cost: Transportation: $1100; Hotel: 10*$180; Meals: 10*$52; Total (rounded): $3420 first year.
Note: For October 2007, Air Canada lists tickets between Montreal and Geneva at $1017.42.

Travel to China: Five (5) days in Beijing and five (5) days in Shanghai early in the second year of the program.
Purpose: Meet the student working for me at Beijing Foreign Studies University and conduct semi-directed interviews with him in Shanghai.
Cost: Transportation: $2000 (including internal travel with my assistant in China); Hotel (1 room in Beijing and 2 in Shanghai): 5*100+10*100; Meals: 10*$52; Total (rounded): $4020 in the second year of the program.
Note: For October 2007, Air Canada lists tickets between Montreal and Beijing at $1402.41. Two tickets between Beijing and Shanghai can be purchased from a Chinese airline for $500.00.

Travel to academic conferences: two (2) each year of the program, one in Canada and one in Europe or the United States.
Purpose: diffuse results and obtain comments on papers at the meetings of the European Consortium of Political Research, the European Group for Organizational Studies, the American Political Science Association, the Canadian Political Science Association.
Cost: Transportation: 2*$500; Hotel: 2*(3days*$180); Meals: 2*(3days*$52); Registration: 2*$300; Total (rounded): $2300 per year.
Note: the cost of travel to conferences includes economies realised when taking advantage of the travels for the semi-directed interviews. Registration fees exclude membership fees to professional associations.

Other Expenses

Cost for the transposition of the survey in web format and for hosting it (contracted to a private firm): $6000 the first year and $1000.00 each of the two subsequent year.
Note: web surveys are too heavy to be hosted on the university server. The cost estimates are based on the real costs of my previous web survey.

Transcription of interviews: 30 transcripts * $100 = $3000 or $1500 per year for the two first years.

One lap top computer for the Ph.D. student: $1300 in the first year of the program.
Note: the other student can use the computer of the CPDS.

Purchase of software (fs/QCA and STATA): $2000 in the third year of the program.
Note: other software is provided by the university; fs/QCA and STATA will not be needed in the first two years of the program.

Telephone, fax and photocopies; telephone and fax expenses will be incurred for the planning of the semi-directed interviews, as well as for communication with informants during the preparation of the QCA raw tables: $300 per year.

Research Time Stipend

Purpose: the RTP is for the applicant the first year of the program only. It will provide sufficient time to launch the program, notably the in-depth case studies. The questionnaires will have to be prepared and will require traveling to Switzerland and China. These crucial tasks will prove to be time consuming for the applicant during the summer and fall of 2008 and the spring of 2009. A reduced teaching load in the first year should allow the applicant to devote sufficient time to these tasks.

Cost: $4500 the first year only

Total Funds Requested From SSHRC

Year 1: $47 720
Year 2: $37 520
Year 3: $27 000

The total for the three years is $112 240. 69.7% of this amount will be spent on students.