

Report of the 2005 Networks of Centres of Excellence Selection Committee June 2004

TABLE OF CONTENTS

	Page
REMARKS FROM THE CHAIR	2
BACKGROUND	4
COMPETITION PROCESS	6
NCE SELECTION COMMITTEE RECOMMENDATIONS	7
SUMMARY OF NETWORKS RECOMMENDED FOR FUNDING	8
APPENDIX I NCE Program Criteria	14
APPENDIX II Terms of Reference: 2005 NCE Selection Committee	16
APPENDIX III Membership of the 2005 NCE Selection Committee	17
APPENDIX IV Biographical Notes of the Selection Committee Members	18

REMARKS FROM THE CHAIR

Introduction

The 2005 Networks of Centres of Excellence Competitions that just ended were designed to evaluate 5 new proposed networks and 4 networks applying for a second NCE funding cycle. The NCE Selection Committee was composed of 12 members from Canada and abroad who, in total, were able to represent areas covered by all competing networks. Each member of the Selection Committee evaluated the extensive materials provided for each of the networks, so as to be able to discuss each application and ultimately provide a recommendation to the NCE Steering Committee. Throughout the deliberations, each network was assessed against the 5 requirements of Excellence established for the NCE program: excellence of the research program, development of highly qualified personnel, networking and partnerships, knowledge and technology exchange and exploitation, and the management of the network. The members of the Committee made individual evaluations of each application followed by several rounds of group discussions before making their recommendations.

This was a special competition as both new and renewing applications were evaluated by the same Selection Committee. All applications were of high quality.

Recommendation for new networks

As a result of the call for applications for new networks in March 2003, the Networks of Centres of Excellence (NCE) Directorate received 31 letters of intent. The NCE Selection Committee was directed to select excellent proposals. The entire process, from the announcement of the competition to the recommendation of new networks to the NCE Steering Committee, occurred over a period of approximately 18 months (review of the letters of intent, review of full applications, Expert Panel reports, and Committee deliberations).

In a first phase, the Selection Committee recommended that 5 groups be invited to submit full applications. In a second phase, in June 2004, the Committee reviewed carefully these 5 full applications, and identified 1 proposal that met all criteria of excellence within the NCE program.

The Selection Committee had access to the complete proposal documents, to the Selection Committee comments from the LOI stage, and to the reports of international Expert Panels that met each network. The Chair of each Expert Panel was consulted during deliberations to answer additional questions from the Selection Committee about the network, where appropriate.

Interest in this competition from all regions of the country was clearly evident as was the participation of industrial, commercial and community sectors. The Selection Committee was encouraged to see the extent to which multidisciplinary approaches to research themes within networks grew and matured during the proposal process.

The NCE Selection Committee is confident that the recommended network will create significant incremental improvement in both the capacity of Canadian research institutions to generate social and economic value within our society and the enhancement of Canadian leadership within the world community.

Recommendations for networks applying for a second NCE funding cycle

The Selection Committee recognized the national importance of the research areas represented by the 4 renewing applications. It was clear that networks were, in general, composed of many high quality researchers and innovative research programs. Overall, the Committee was impressed by the large number of researchers and partners from commercial, industrial, and community sectors involved in each network. It was also impressed by the quality of the training activities and personnel, and efforts made by most networks to retain these highly skilled individuals in Canada.

The Selection Committee had access to networks' progress reports and future strategic plans, and past reports of Expert Panels that met each network. The Chair of each Expert Panel was consulted during deliberations to answer additional questions from the Selection Committee about the network, where appropriate.

As required, each network was evaluated against each of the five NCE program criteria. As these networks were applying for their last funding cycle, the Committee also examined each network's vision for this funding cycle, its integrated research and training strategies, and the network's strategy with regards to transfer of knowledge and technology of network results to users sector. The recommendations represent the Committee's judgment of the relative merits of each case against the established criteria and the potential value added by additional investments in the networks.

Following review by individual committee members and extensive committee discussions, the Selection Committee recommended that all four networks be funded.

The NCE Selection Committee is confident that the additional funding cycle for the recommended NCE renewing applications will continue to increase the national research and training capacity of the universities and their network partners leading to social and economic value within our society.

Conclusion

The recommendations from the Committee reflect the commitment of all members to the principle of excellence that is trademark of the NCE program. As Chair, I would like to thank all members of the Selection Committee for their dedication and commitment ensuring that the goals of the NCE program are met through the recommended networks. Finally, I would like to thank all members of the international Expert Panels for their contributions and the NCE Directorate for their support for the entire process.

Verna M. Skanes, PhD

Chair, NCE Selection Committee 2005

BACKGROUND

The Networks of Centres of Excellence (NCE) program seeks to mobilize Canada's best research talent in the university, private and public sectors, and to apply it to the task of developing the economy and improving the quality of life of Canadians. Networks are selected on the basis of their excellence in research, their inclusion of the best cross-country talents, the extent of their partnerships with the receptor community, and their potential for socio-economic benefits. Industry Canada and the three granting agencies (the Natural Sciences and Engineering Research Council, the Canadian Institutes for Health Research, and the Social Sciences and Humanities Research Council) jointly manage the program.

Since its inception in 1989, the NCE program has been linking Canadian researchers from the university, public and private sectors to work collaboratively on the advancement of research on the development of new technologies. Networks provide opportunities to develop innovative research approaches that cross traditional disciplinary and sectoral boundaries, and promote collaborations among social, physical and medical scientists and engineers. These collaborations have contributed significantly to accelerating the uptake of new knowledge and technologies by the industry and other receptor communities, and they have led to important socio-economic benefits.

The call for applications for the 2005 NCE Competition was issued in March 2003 by the Government of Canada to establish new networks. University researchers and their private and public sector partners were invited to present letters of intent by September 8, 2003. A total of 31 letters of intent were received. The NCE Selection Committee met on September 16-17 to complete its review and prepare its recommendation to the NCE Steering Committee. A total of 5 applications were invited to submit a full application by April 5, 2004.

A competition for networks applying for a second NCE funding cycle was held in parallel with the 2005 competition for new networks. Four networks applying for a second NCE funding cycle were also evaluated by the same Selection Committee.

The NCE program follows a rigorous peer-review process to evaluate, first, the letters of intent (for new applications) and, later, the full applications (for new and renewing applications) against the five criteria of the program:

- ? Excellence of the Research Program
- ? Development of Highly Qualified Personnel
- ? Networking and Partnerships
- ? Knowledge and Technology Exchange and Exploitation
- ? Management of the Network

Criteria are detailed in Appendix I. The Committee's mandate and membership are provided in the other appendices.

Each full application (new and renewing) was also subjected to a review by an Expert Panel responsible for performing an in-depth evaluation of the strengths and weaknesses of the proposed network. Face-to-face visits by Expert Panels, were conducted in April and May 2004. Full applications and individual Expert Panel reports were submitted to the Selection Committee and were used in elaborating the final recommendation to the NCE Steering Committee.

For networks applying for a second NCE funding cycle, peer-reviewers also had access to networks' past Expert Panel reviews. A renewing network compared to a proposal for a new network had to demonstrate tangible achievements, and a higher level of maturity, efficiency and excellence in relation to each of the five NCE program criteria.

COMPETITION PROCESS

March 2003	Announcement of the 2005 NCE Competitions for new networks and networks applying for a second NCE funding cycle.
September 8, 2003	Deadline for submission of letters of intent for 2005 new Competition only.
September 16-17, 2003	Meeting of the NCE Selection Committee to review letters of intent of 2005 new Competition and recommend groups to be invited to submit full applications.
April 5, 2004	Deadline for submitting full applications (new and renewing Competitions).
April- May 2004	Expert Panel reviews of each new and renewing networks.
June 17-18, 2004	Meeting of the NCE Selection Committee to review the full applications and make final recommendations on funding to the NCE Steering Committee.
June 30, 2004	Meeting of the NCE Steering Committee to review funding recommendations of the NCE Selection Committee and make a final decision.
Summer 2004	New network receive first funding of its administrative centre, following the signing of a Memorandum of Understanding.
Fall 2004	Public announcement of newly awarded and second funding cycle networks.
Spring 2005	Signing of Network and Funding agreements, and launch of research activities for the new network and continuation of second funding cycle networks.

NCE SELECTION COMMITTEE RECOMMENDATIONS

The 2005 NCE Selection Committee identified the top applications that exceed the threshold of excellence for the NCE Program. The NCE Selection Committee recommended support for 5 networks as indicated below (in alphabetical order):

New Network of Centres of Excellence

Network Title	Scientific Director	Host Institution
AllerGen (Allergy, Genes and Environment Network)	Judah Denburg	McMaster University

Renewed Networks of Centres of Excellence for a Second NCE Funding Cycle

Network Title	Scientific Director(s)	Host Institution
CAN (Canadian Arthritis Network)	Jane Aubin/Robin Poole	Mount Sinai Hospital
CIPI (Canadian Institute for Photonic Innovations)	Robert Fedosejevs (University of Alberta)	Université Laval
GEOIDE (Geomatics for Informed Decisions)	Keith Thomson	Université Laval
MITACS (Mathematics of Information Technology and Complex Systems)	Arvind Gupta	Simon Fraser University

Funding these networks, now, is a high priority for Canada. These networks are recommended for funding through the point of mid-term review during their year 4 (2008-2009). Amounts recommended in years 5 to 7 are subject to successful reviews in year 4 and will be the subject of a future submission.

SUMMARY OF NETWORKS RECOMMENDED FOR FUNDING

A) New network

AllerGen (Allergy, Genes and Environment Network)

AllerGen, a new national Network of Centres of Excellence, aims to improve the health, well-being and productivity of the more than one-third of Canadians who suffer from allergies.

The incidence of allergic diseases such as hay fever, asthma, eczema and food allergies has reached unprecedented levels in Canada and the Western world. The economic impact of these disorders on performance at school or in the workplace is significant and growing. For example, lost productivity in North America because of allergies and asthma is valued at more than \$600 million a year. Direct expenditures on medical care for the more than five million North American children with asthma is estimated to be in excess of \$5 billion. Medical specialists and para-professionals trained in allergic diseases are in very short supply in most areas of the country, and patient waiting lists are growing unacceptably. Children with food allergies (such as peanuts) are at risk of sudden death from an allergic reaction, leading to constant fear and anxiety for them, their families, classmates and teachers. The important public health impact of occupational allergies, such as to industrial cleaning products or latex-based rubber gloves, is illustrated in many Canadian and U.S. health studies. In addition, more needs to be understood about the interplay between allergy risk factors and other environmental stimuli such as atmospheric pollution, which may cause increases in the severity and consequences of asthma and other allergic illnesses.

AllerGen will coordinate the activities of top Canadian research scientists, physicians, healthcare providers and groups representing allergic disease sufferers – in partnership with leading drug, food and biotechnology companies, institutes, school boards, workers' groups and government agencies – to study allergic disease and develop new tests, devices and treatments that will improve care and the quality of life for patients. AllerGen's research and development program unites more than 120 academic researchers and collaborators located at 14 Canadian universities, and more than 50 Canadian and international partners, to develop new genetic and other medical diagnostic tests, better medications, and environmental, health and workplace safety policies and improved care for allergic disease sufferers.

Through research on the genetic, psychosocial, environmental and economic aspects of allergic disease, new knowledge will be quickly transformed into innovative products and services, and will help health workers educate the public. Between 2005 and 2009, partner investments – matching the investment by the Networks of Centres of Excellence program – will stimulate the allergic disease research enterprise in Canada, and position Canada as an international leader in decreasing allergy-related disability and healthcare costs. AllerGen will also address the dire shortage of allergists and allergic disease researchers in Canada, offering new positions for more than 100 research trainees, and doubling the number of highly qualified Canadian clinical specialists and research scientists produced in this field each year.

Dr. Judah Denburg, Professor of Medicine and Director of Clinical Immunology and Allergy at McMaster University, and an internationally recognized leader in allergic disease research, will serve as Scientific Director of AllerGen. The research program includes many Canadian leaders in the fields of allergy, immunology, asthma, genetics, social sciences, and environmental, occupational and population health. The Host Institution for AllerGen will be McMaster University, which recently received a gift of more than \$100 million, some of which will be invested to create, with AllerGen, a leading international centre for infection, allergy and immunity.

B) Second funding cycle networks

B.1 Canadian Arthritis Network (CAN)

The vision of the Canadian Arthritis Network (CAN) is a world free of arthritis. It is a very old disease and treatments to attempt to alleviate the suffering it causes date back to 500 BC. Four million Canadians have arthritis and the number is expected to increase to over six million by 2026. The public perception is that arthritis is a disease of old age but three out of five people with arthritis are under age 65. It has a serious impact on the ability of people to earn a living. The economic burden of musculoskeletal conditions (mostly arthritis) in Canada is about \$15 billion a year, second only to the cost of cardiovascular disease. The economic burden of musculoskeletal conditions in Canada accounts for 10.3 per cent of the total economic burden of all illnesses but only accounts for 1.3 per cent of health science research.

CAN is the single point of contact that links 145 leading Canadian arthritis researchers and clinicians, 50 Canadian academic institutions, The Arthritis Society, Canadian Institutes of Health Research, pharmaceutical and biotechnology companies, and government. The Network funds research and acts as a facilitator, bringing scientific discoveries to market by providing access to cutting-edge techniques for product development and evaluation. It offers pre-clinical as well as clinical research services and facilitates technology transfer and the commercialization of new discoveries.

The research of the Canadian Arthritis Network is focused on finding the cause of arthritis, finding methods to diagnose it at an earlier stage before symptoms appear, finding treatments that cure arthritis and finding a way to repair damaged joints. There are treatments for rheumatoid arthritis that can often restore quality of life but there are no drugs that slow or stop the progression of osteoarthritis, which affects three million Canadians.

The Network is unique in that it involves people with arthritis – consumers – as equal partners in all Network decision-making including setting research priorities and research assessment. The consumers ensure that the research is relevant to people with arthritis and they put a human face on the disease.

The Canadian Arthritis Network conducts research from the bench to the bedside to the community. The Network played a pivotal role in the creation of the Canadian Rheumatology Research Consortium (CRRC) and continues to nurture its development. The CRRC is the first national clinical trials consortium of its kind. It is bringing new therapies to Canadians sooner and enhancing Canada's competitiveness in the global marketplace.

The research conducted in CAN-funded projects has resulted in the development and commercialization of new imaging and biomarker technologies to show the early presence of arthritis before joint damage is visible on an x-ray. These make it possible for physicians to diagnose disease at an earlier stage, identify patients where it is progressing rapidly, and monitor the effectiveness of treatment.

Canada is a global leader in the discovery and development of effective arthritis treatments. CAN's vision and leadership is having a major impact on the research landscape.

B.2 Canadian Institute for Photonic Innovations (CIPI)

Photonics will be to the 21st century what electronics was to the late 20th century. It is the science of generating, manipulating, transmitting and detecting light. Potential applications cover information technology, telecommunications, environmental monitoring, biomedical science and industrial processes. Photonics is changing the daily lives of Canadians both in the strong economic impact created by Canada's global leadership in telecommunications and in the medical and technological advances it has spawned.

In collaboration with industrial partners, CIPI's team of internationally-renowned investigators is developing photonics along three thrusts: Information and Telecommunications; Biophotonics; and Frontier Photonics. Work is being carried out in such diverse fields as the development of photosensitive polymer and chalcogenide glass materials for photonic devices; dynamic photonic components to steer light in communication networks; and the use of light to activate drugs in the body (photodynamic therapy or PDT) for therapeutics. CIPI brings together a large number of leading investigators from 88 Canadian universities, government laboratories, hospitals, industry to facilitate collaboration on new opportunities that the field of photonics offers.

PDT involves the administration of light-activated drugs that tend to accumulate in tumours or rapidly developing blood vessels. When light is directed onto the tissue via an optical fibre, it induces a chemical process that eventually leads to the destruction of the tumour. To date, this method has been most successful in treating the leading form of blindness in people over 50, called age-related macular degeneration.

CIPI investigators are proposing a novel method for light delivery which they believe may reduce damage to surrounding tissue. Although still in the initial stages of research, the work performed by the CIPI team could lead to a more effective treatment regime. The ability to localize the interaction to a small micron-sized spot at the focal point of the laser, resulting in less out-of-focus damage, suggests that PDT by two-photon excitation of the sensitizer will have very important applications in places where damage to healthy tissue must be avoided, such as in the eye or the brain.

This project is an exciting example of the emerging field of biophotonics. Recognizing the need to foster its growth, CIPI, in partnership with Vitesse Re-Skilling Canada, organized a three-day BioLIGHT workshop aimed at starting a creative inter-disciplinary dialogue among physicists, photonics experts, biologists, medical practitioners and industrial representatives. It featured talks by outstanding, internationally-recognized Canadian and US specialists. The success of the workshop has spawned a number of follow-up initiatives in the field, including a NATO Advanced Study Institute summer school in biophotonics. Plans for a second edition of BioLIGHT are also under development.

CIPI-trained graduate students find work in just about every sector of the economy. Because over 70% remain in Canada after graduation, CIPI is creating a pool of highly-qualified personnel in a strategic area that will fuel further growth and development. Intellectual property is also key to development. Many patent applications have been filed as a result of CIPI research projects, and CIPI is active in the transfer of technology. To date, five companies have been spun off, and the network continues to support the creation and development of others through its Technology Exploitation and Networking program.

CIPI's commitment to achieving synergy will provide Canada with new enabling capabilities in photonics to maintain its leadership in the telecommunications, health care and high technology industries.

B.3 Geomatics for Informed Decisions Network (GEOIDE)

The use of geomatics technologies has become part of everyday Canadian life. Global Positioning System (GPS) units are now commonly in use; Geographical Information Systems (GIS) represent a mature technology in both private and public sector planning; and the capacity to incorporate spatial information and associated statistics into a variety of decision-support applications is increasing. The benefits of location-based "where and when" information are enormous and span many sectors of society, including natural resources, disaster management, national security and defence, municipal and metropolitan city services, infrastructure of all sorts, shipping, retail, finance, real estate, health, education and the environment. Estimates of the 2005 world market for spatial information alone are in the order of \$25 billion. The growth in the geomatics world market is estimated to range from 6 percent to 30 percent a year, depending on the sector of activity.

In 2001, the Geomatics Sector Human Resources Study reported 27,000 jobs in the field, with 80% of workers having a university education, compared to the 15% reported 12 years ago. This reinforces GEOIDE's goal of training and graduating enough highly-qualified personnel to form the backbone of a self-sustaining network able to face the challenges of the future. This is being accomplished through an internal student network and annual summer school highlighting business skills and entrepreneurship, an annual scientific conference, the GEOIDE Web site and newsletter, and grants to facilitate networking.

GEOIDE projects are organized under a number of themes and thrusts. The Transportation and Disaster Management thrust covers topics such as basic navigational support via new GPS methods and new satellites, as well as making important contributions to disaster management. The problem of supporting a panicked population in the midst of a disaster, whether natural or human-caused, has made a number of headlines in the past few years. The problems of transport and transport management have a lot in common with dealing with such disasters. Data fusion is one of the key science issues that must be addressed to support effective disaster management. GEOIDE anticipates that developments in data fusion will be transferable to other disciplines both within the field of geomatics as well as in related information and imaging technologies.

Within its Health and Social Sciences thrust, GEOIDE is making inroads into new applications of geomatics. In one project, geomatics is enabling coronary thrombosis researchers to easily identify geographical and generational disparities not readily available from traditional statistics. The objectives of this project are to compare surgical procedures and short- and long-term medication and mortality rates, as well as study the demographic, social, geographic and medical characteristics of victims and offer support to medical professionals whose decisions may be affected by this information. Two projects focus on the development of interactive databases for sustainable community development. Another project targets the development of innovative geomatics tools for an archaeological dig. In all cases, the processes follow a similar pattern – they must adapt, extend, and sometimes develop new functional capabilities for existing GIS tools in order to meet the specific needs of new and challenging applications.

Under the Sustainable Land and Marine Resource thrust, research focuses not only on developing applications for more traditional resources such as forestry, agriculture, fishing, mining, and oil and gas, but also on solving problems in pollution monitoring, environmental assessment and climate change. For instance, one project is dedicated to the use of hyperspectral imaging techniques to support petroleum exploration while another innovative project seeks to combine different sources of data to provide fast, full coverage of water vapour estimates across the country.

GEOIDE has been instrumental in bringing together 61 universities with over 150 public and private sector partners to advance the field of geomatic research.

B.4 Mathematics of Information Technology and Complex Systems (MITACS)

Industry as a whole is beginning to realize that advanced technologies are critical to the bottom line and that direct links between competitiveness and efficiency can be identified through the application of mathematics. MITACS works with organizations to identify their problems, find scientists with the expertise to help solve those problems and provide significant funds towards research and innovative solutions. This explosion of activity in industrially relevant math has been largely due to MITACS. Its leadership position as an innovative model has been established through activities such as networking and collaboration, and student internships in industry. There is a growing international awareness of the success of the model, with China, Australia and others exploring avenues for cooperation and interest in establishing a similar entity.

To improve Canada's international competitiveness, MITACS research focuses on five key sectors of the economy: Biomedical & Health, Environment & Natural Resources, Information Processing, Risk & Finance and Communication, Networks & Security. Projects cover industrial issues that range from efficiency, cost-effectiveness and pricing improvements in business operations to privacy-enhancing technologies. They include applications of data mining in telecommunications, insurance and pharmaceutical industries, as well as real-time signal processing where applications will potentially be used in search and rescue operations. As a result of these projects, MITACS has evolved into a major scientific enterprise, involving 36 universities and 153 partner organizations.

In response to the emergence of SARS in the spring of 2003, followed by West Nile Virus and then bird flu, MITACS established a project to model and simulate the outbreak of infectious diseases and take a first step towards establishing a permanent national focus group on mathematical modeling and simulations for the prevention and control of future infectious diseases. The team, a cross-country network of scientists, started a crucial dialogue between the mathematical sciences and medical research communities. It developed a model of SARS transmission dynamics which concluded that a combination of two disease-control measures – stricter hospital procedures and quarantines – is key to the short-term containment of the epidemic, whereas quarantine is essential in the longer term. In a similar vein, research is now being carried out on West Nile Virus, examining how the migration of mosquitoes and birds from one region to another affects transmission dynamics. Reliable models help develop good public policy that puts government resources where they will have the most effect and directly impact the health of Canadians. The project pulls together different expertise from different areas of the network that become quite crucial to one another. The Internship program is playing a key role in bridging the academia-industry divide. Graduate students and postdoctoral fellows work on-site for 4-8 months with companies to determine opportunities for research under the direction of their academic professor and an industrial mentor. Within the next three years, over 200 students will benefit from this opportunity. The goal is to create a self-sustaining cycle of training for industry and academia. Industry benefits from the latest techniques, thereby enhancing its competitiveness. New job opportunities open to students through their experience and contacts at their internship placement, while those who choose academia leverage their industrial experience in the future training of their own students.

Technology transfer is integral to the success of MITACS. Research has spawned seven start-ups that have important commercial potential. One example is Random Knowledge Inc., a spin-off from the project *Prediction in Interacting Systems*. The company is commercializing research that helps with the prediction, tracking and signal enhancement in areas such as network security, fraud detection and finance. Two patents have been filed. As well, two copyrights and three licenses are currently under negotiation.

MITACS is demonstrating that the power of mathematical research is pervasive and can be used to provide revolutionary and wide-scale benefits to Canadians while continuing to meet the challenge of establishing an intellectual base of research expertise for the country.

APPENDIX I NCE PROGRAM CRITERIA

Program Criteria

To ensure that the program objectives are met, proposals are assessed against the five criteria outlined below. Networks are also evaluated on an ongoing basis during tenure of a grant against these same criteria. Research excellence is a necessary condition for the initial or continued funding of an NCE. It is not the sufficient condition, because the goals of the program are also reflected in the four additional criteria.

The five program criteria are described below:

Excellence of the Research Program

- The excellence, focus and coherence of the research program;
- The achievements of the researchers and their ability to contribute to the research program;
- The value added by the network approach, in terms of the quality of the research and achievement of the goals that can be pursued;
- The extent to which the program will contribute to Canada's ability to lead in areas of research with high economic and social impact;
- The extent to which new and emerging social and ethical issues, where relevant, will be addressed in the research program;
- The relationship of the research program to similar work conducted in Canada and abroad.

Development of Highly Qualified Personnel

- The ability to train and retain outstanding researchers in research areas and technologies critical to Canadian productivity, economic growth, public policy and quality of life;
- Training strategies that promote multidisciplinary and multisectorial research approaches and encourage trainees to consider the economic, social and ethical implications of their work.

Networking and Partnerships

- Effective research and technology development links between academic institutions, federal and provincial agencies and private sector participants;
- Multidisciplinary, multisectorial approaches in the research program;
- Evidence that an effort has been made to include all suitably qualified groups;

- Optimization of resources through the sharing of equipment and research facilities, databases and personnel;
- Presence, nature and extent of contributions from the private sector and federal and provincial agencies, and prospects for increasing commitments as the work progresses.

Knowledge and Technology Exchange and Exploitation

- Likelihood that new products, processes or services can be commercialized by firms operating in Canada and that these will strengthen the Canadian industrial base, enhance productivity, and contribute to long-term economic growth and social benefits;
- Prospect for social innovation and the implementation of effective public policy through collaboration with the public sector;
- Effective collaboration with the private and public sectors in technology, market development, and public policy development;
- The impact, or potential impact, on the partners' science and technology capabilities and practices;
- Effective management and protection of intellectual property resulting from network-funded research.

Management of the Network

Each network must possess an organizational structure appropriate for the management of the research and business functions of a complex multidisciplinary, multi-institutional program. These elements must include:

- A board and committee structure to ensure that appropriate policy and financial decisions are made and implemented;
- The presence of effective leadership and expertise in the research and the business management functions;
- Effective research planning and budgeting mechanisms;
- Effective internal and external communications strategies.

Review Context for first and second NCE funding cycle applications

For a new network, its future strategic plan will be evaluated against the NCE program criteria. For a network applying for a second NCE funding cycle, both the progress to date and the future strategic plan for will be evaluated against the NCE program criteria. A renewing network, as compared to a proposal for a new network, must demonstrate tangible achievements, and a higher level of maturity, efficiency and excellence in relation to each of the five NCE program criteria.

**APPENDIX II
TERMS OF REFERENCE:
2005 NCE SELECTION COMMITTEE**

The Selection Committee is responsible for:

Competition for new networks:

- Reviewing NCE letters of intent (LOIs) and selecting groups of applicants to be invited by the NCE Steering Committee to submit a full NCE application (September 2003); and
- Drafting confidential evaluation reports for all LOIs submitted in the competition (September 2003).

Competition for new and second funding cycle networks:

- Reviewing invited applications and Expert Panel reports (April-June 2004);
- Drafting confidential evaluation reports for all full applications submitted in the 2005 competition (June 2004); and
- Transmitting to the NCE Steering Committee a list of networks recommended for funding (June 2004).

APPENDIX III MEMBERSHIP OF THE 2005 NCE SELECTION COMMITTEE

Chair:

Dr. Verna Skanes, Consultant, NF, Canada

Members:

Dr. Patricia Baird, Consultant, BC, Canada

Dr. John Clement, QLT Inc., BC, Canada

Dr. Khadiyatoula Fall, Université du Québec à Chicoutimi, QC, Canada

Dr. Cathy Garner, Centre for the Management of Intellectual Property in Health R&D, England

Dr. Camille Limoges, Consultant, QC, Canada

Mr. David Lynch, Genum Corporation, ON, Canada

Dr. Renée Lyons, Dalhousie University, NS, Canada

Dr. Ian McDowell, University of Ottawa, ON, Canada

Dr. Sami Rizkalla, North Carolina State University, NC, USA

Dr. Eva Rosinger, Rosinger & Associates, BC, Canada

Dr. John Spence, University of Alberta, AB, Canada

APPENDIX IV BIOGRAPHICAL NOTES OF THE SELECTION COMMITTEE MEMBERS

2005 NCE Selection Committee

Patricia Baird

Dr. Patricia Baird was trained as a pediatrician then specialized in medical genetics. She was Head of the Department of Medical Genetics at the University of British Columbia for over a decade, being extensively involved in developing provincial services for families. Her own research has been in two phases; the first focusing on the distribution and natural history of birth defects and genetic diseases using a population based registry, the second on the societal, ethical and policy implications of genetic and reproductive technologies.

She has been a member of numerous national and international bodies, among them the National Advisory Board on Science and Technology chaired by the Prime Minister, and the Medical Research Council of Canada (and its Standing Committee on Ethics in Experimentation). Since the mid 80's she has been associated with the Canadian Institute for Advanced Research. She was appointed by the Prime Minister to head the Royal Commission on New Reproductive Technologies, which, after broad public consultation and extensive research, made policy recommendations to the Canadian Government.

She is an elected Fellow of the Royal Society of Canada, has received three honorary degrees, the Order of British Columbia, and is an Officer of the Order of Canada.

John Clement

Dr. John Clement is Director of Business Development at QLT Inc. QLT Inc. is a global biopharmaceutical company dedicated to the discovery, development and commercialization of innovative therapies to treat cancer, eye diseases, dermatology and niche areas for which treatments can be marketed by a specialty sales force. Prior to joining QLT Inc, Dr. Clement worked for BioChem Pharma in Montreal as the Associate Director of Pharmacology and Toxicology and then the Director of Extramural Research, responsible for the external research program. He was also employed at Medical Countermeasures section of Defence Research and Development Canada and for Ciba-Geigy. His expertise include pharmacology, toxicology and animal physiology.

Khadiyatoulah Fall

Dr. Fall holds the Chair in Intercultural Teaching and Research at the Université du Québec à Chicoutimi and is the Co-Director of CELAT, the interuniversity centre for studies on arts, letters and traditions, operated by the Université du Québec's Montreal and Chicoutimi campuses together with Université Laval. Dr. Fall's interdisciplinary research applies the tools of discourse analysis and the cognitive sciences to some of the most crucial issues under debate in modern society – democracy, human dignity, tolerance, citizenship, innovation, and globalization – in order to understand the determinants of differing perceptions of these issues across different socio-political and socio-cultural contexts. Dr. Fall has served on numerous expert committees at various national and international organizations, including SSHRC (where he chaired the Major Collaborative Research Initiatives Committee), 'Agence universitaire de la francophonie'; the 'Conseil national de la

recherche scientifique (CNRS)' in France, the 'Fonds québécois de recherche sur la culture et la société', and UNESCO.

Cathy Garner

Dr. Cathy Garner is Chief Executive Officer of MIHR (The Centre for the Management of Intellectual Property in Health Research and Development). MIHR is a not for profit organisation with UK charitable status based in Oxford, England. MIHR was founded in 2002 by the Rockefeller Foundation and has a mission to reduce health inequity through the promotion of creative management of intellectual property.

Dr. Garner has extensive international experience of intellectual property management and technology transfer having established and run the Research and Enterprise Office at the University of Glasgow in Scotland. She is a member of the Association of University Technology Managers (AUTM) in the USA and served for three years as their inaugural Vice President for International Relations. Her career includes ten years of academic research and eight years of policy and research management in the public sector. She has acted as an advisor to Committees in the UK, Canada, Japan and South Africa on intellectual property matters and served on ministerial reviews of enterprise in Scotland. She was a founder director of the Scottish North American Business Council, has held numerous Board positions and is a member of the Merchant Company of Edinburgh and a Fellow of the Royal Statistical Society of the UK.

Camille Limoges

Dr. Camille Limoges recently retired as Deputy Minister of Québec's ministère de la Recherche, de la Science, et de la Technologie. His three decades of work, both as a scholar and a civil servant, has made an indelible mark on science and technology research. Well-known as a pioneer in the field of the history of science and technology in Québec, Dr. Limoges founded the 'Institut d'histoire et de sociopolitique des sciences' at the Université de Montréal in 1973. Ten years later, he became the Deputy Minister of Québec's newly-created 'ministère de l'Enseignement supérieur et de la Science'. Returning to academia in 1987, this time to the Université du Québec à Montréal, Dr. Limoges joined a multi-university team to create the 'Centre de recherche en évaluation sociale des technologies'. Thereafter, he went on to found and serve as director of the 'Centre interuniversitaire de recherche sur la science et la technologie'. He also served from 1989 to 1990 as president of ACFAS (Association canadienne-française pour l'avancement des sciences). In 1997, he became president of the Conseil de la science et de la technologie (CST). The Government of Québec integrated a number of proposals developed by the CST into its most recent policy on science and technology, announced in January 2000. Dr. Limoges received his PhD from the Sorbonne in 1968.

David L. Lynch

Mr. David L. Lynch joined Gennum Corporation in April 1994 as Vice-President, Research and Development. He became Vice President and General Manager, Video Products in June 2000 and Senior Vice President and General Manager, Video Products in February 2004; he is responsible for all aspects of the video image processing and broadcast IC business, including marketing and sales, product development and sourcing. Between 1978 and 1994, Mr. Lynch held a variety of technical and management positions with Bell Northern / Northern Telecom and prior to leaving had global responsibility for semiconductor design, tools and methodology. Over his career, Mr. Lynch has developed advanced expertise in integrated circuit development, including mixed signal and digital silicon design, silicon new product introduction, tools and methodologies, and silicon and packaging technology development. An engineer by training, Mr. Lynch is a member of the Board of Directors of Gennum's Japanese and European subsidiaries. He is also actively involved with a number of industry associations; he is currently Vice Chairman of the Micronet Board of Directors and

Chairman of EMPOWR; and he has previously served on the Boards for the Canadian Semiconductor Design Association (CSDA) and the Canadian Microelectronics Corporation (CMC). He has also served on the technical and selection committees for the Custom Integrated Circuits Conference (CICC), Micronet and CMC. He has authored a number of technical papers and holds a number of patents.

Renée Lyons

Dr. Renée Lyons is Professor and Director of the Atlantic Health Promotion Research Centre, Dalhousie University with appointments in the Department of Psychology and the School of Health and Human Performance. She holds a Tier 1 Canada Research Chair in Health Promotion. As Director of the Atlantic Health Promotion Research Centre, she creates multidisciplinary research teams on health issues of particular concern to the four Atlantic Provinces; mentors researchers and is active in knowledge translation and health policy, and research training. Her primary research areas include social integration and health systems reform in chronic illness, and rural health. She has been involved in numerous initiatives related to research development in Canada and internationally, including national research review panels, Special Advisor to the President of the Canadian Institutes of Health Research, research development in the Balkans, and is currently a theme leader of the Canadian Stroke Network.

Ian McDowell

Dr. Ian McDowell is professor (and past chair) in the Department of Epidemiology and Community Medicine at the University of Ottawa. He has been conducting research on the epidemiology of aging for the past 15 years. From its inception in 1990, Dr. McDowell has been the principal investigator of the Canadian Study of Health and Aging. He has particular interests in health measurement, and in analyzing the way in which social circumstances influence health. Dr. McDowell has served on research grant review committees for the Ontario Ministry of Health, the U.S. National Institutes of Health, the Canadian Heart Foundation, the National Health and Welfare Department, the Medical Research Council of Canada and the Canadian Institutes for Health Research (1999-2001).

Sami Rizkalla

Dr. Sami Rizkalla is a Distinguished Professor of Civil Engineering and Construction and Director of the Constructed Facilities Laboratory at North Carolina State University. He is the Past President of the Canadian Network of Centres of Excellence on Intelligent Sensing for Innovative Structures (ISIS Canada). Dr. Rizkalla's current research is in the field of advanced composite materials and its use for civil engineering applications. He is Chairman of American Concrete Institute Technical Committee 440 on Fiber Reinforced Polymer for Reinforcement and is a member of ACI Committee 550 on Precast Concrete. He is a member of the Editorial Board of the ASCE Journal Composite for Construction, USA Editor of the Elsevier Science Construction and Building Material Journal and a member of the Advisory Board of the Japanese Journal of Advanced Concrete Technology. He is a member of the TRB Committee A2C07, Structural Fiber Reinforced Polymer and past Associate Editor of the Canadian Journal of Civil Engineering. He is Chief Editor of the FRP International Newsletter. Dr. Rizkalla is a Fellow of the American Society for Civil Engineers, Fellow of the Canadian Society for Civil Engineering, Fellow of the American Concrete Institute and Fellow of the Engineering Institute of Canada. Dr. Rizkalla has been active in the Association of Professional Engineers and Geoscientists of Manitoba (APEGM) as past Chairman and member of several committees, and served on the association's council. In 1994, the APEGM awarded Dr. Rizkalla the APEGM Award of Merit for his contributions and activities in engineering education and advancement of technology. In 1995 and 1996, Dr. Rizkalla was presented with an award for superior academic performance by the University of Manitoba. In November 1996, Dr. Rizkalla was

selected by the Canadian Council of Professional Engineers to receive the 1996 Meritorious Service Award for Professional Service.

Eva Rosinger

Dr. Eva L.J. Rosinger, scientist and engineer, is Principal of Rosinger & Associates, a consulting company providing comprehensive advisory services on multi-disciplinary issues in the field of environment, energy, and sustainable development. She has broad interests in the arts, culture and sports, as well as social and health issues. Her academic degrees are a M.Sc. in Chemical Engineering and a Ph.D. in Chemistry. From 1994 to 1998, Dr. Rosinger was Deputy Director for Environment at the Organisation for Economic Co-operation and Development (OECD) in Paris, France. She was responsible for co-managing the environment program at the OECD, overseeing inter-disciplinary co-operation within the OECD and with other international organisations, and leading OECD's delegations at major environmental conferences and meetings. Before accepting the OECD position, Dr. Rosinger was Director General and CEO of the Canadian Council of Ministers of the Environment (CCME). Dr. Rosinger is a member of the Public Advisory Panel for the Environmental Commitment and Responsibility Program, Canadian Electricity Association and of the Lectures Committee of the Royal Canadian Geographical Society. She is a past President of the Canadian Nuclear Society and a former member of the Board on Radioactive Waste of the US National Academy of Sciences, the Board of Directors of the Canadian Institute of Child Health, the Board of Directors of the Winnipeg Symphony Orchestra, the Council of the Association of Professional Engineers of Manitoba and a former vice-chair of the Advisory Development Board for the Banff, Yoho and Kootenay National Parks. Dr. Rosinger is a recipient of the 1992 YM-YWCA Woman of Distinction Award, the 1988 Certificate of Merit by the Government of Canada for Contribution to the Community, and the Order of Sport Excellence and Achievement Award by the Government of Manitoba. She is listed in Canadian Who's Who, Who's Who in Canadian Business, American Men and Women of Science, International Who's Who of Professional and Business Women, and other bibliographies.

Verna Skanes

Prior to her retirement to the private sector, Dr. Skanes was Professor of Immunology and Assistant Dean, Research and Graduate Studies, in the Faculty of Medicine at Memorial University. She is the Ethics Designate on the Advisory Board to the CIHR Institute of Circulatory and Respiratory Health and member of the Advisory Board of the Atlantic Innovation Fund. Dr. Skanes is also a member of the Board of Directors of Canadian Blood Services and chair of that organization's science, safety and ethics committee. She recently chaired the 2003 NCE Selection Committee and three NCE Expert Panels (the PENCE/CGDN/CBDN mid-term review, the Stroke review in 1998 and "Diversigen" in the 2000 NCE targeted competition).

John Spence

Dr. John Spence is the Chair of the Department of Renewable Resources at the University of Alberta. His current research is centred on a large, multidisciplinary study of how forestry practices affect traditional and non-traditional resource values, including biodiversity. This work incorporates fieldwork by students from Canada, Austria, Finland, the Netherlands and the United States. Dr. Spence has served on the governing board and various committees of the Entomological Society of Canada, the executive of the Entomological Society of Alberta and the board of the Alberta Forestry Research Institute. He has served as panel member and chair for several years on the Interdisciplinary Research (GSC21) panel of NSERC. He is the scientific leader of the EMEND (Ecosystem Management by Emulating Natural Disturbance) project of the Sustainable Forest Management Network for which he is a governing Board member from its beginnings in 1995. Dr. Spence has served on the University of Alberta Provost's Task Force for Strategic Planning. He is presently Deputy Editor of the journal *Ecography* and a member of the editorial board for *Agriculture*

and Forest Entomology. Spence was the 2001 Gold Medalist of the Entomological Society of Canada, the 2003 winner of the Canadian Institute of Forestry's Scientific Achievement Award and is an elected foreign member of the Finnish Academy of Science and Letters. The EMEND project has been recognized with both an Emerald Award and Alberta Science and Technology Prize in addition to a Natural Resources Canada Merit Award for team achievement and scientific collaboration.