

Report of the Networks of Centres of Excellence Selection Committee June 2003

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REMARKS FROM THE CHAIR¹

As a result of the call for applications for new networks in January 2002, the Networks of Centres of Excellence (NCE) Directorate received 53 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.

In a first phase, in September 2002, the Selection Committee reviewed 53 Letters of Intent and recommended that seven groups be invited to submit full proposals. In a second phase, in May 2003, the Committee reviewed carefully the full proposals prepared by these seven groups, and identified three that met the criteria of excellence within the NCE program.

The NCE Selection Committee included members from throughout Canada, as well as expert international participants. Interest in this competition from all regions of the country was clearly evident as was the participation of industrial, commercial and community sectors. It was encouraging to see the extent to which multidisciplinary approaches to research themes within networks has grown and matured.

The NCE Selection Committee is confident that the recommended networks would create significant incremental improvement in the capacity of Canadian research institutions to generate social and economic value within our society. As well, we anticipate that Canadian leadership within the world community will be enhanced through the recommended awards.

I am grateful to the members of the Selection Committee for their efforts, dedication, collegiality and commitment to the goals of the NCE program.

¹ N.B. The name of the 2003 NCE Selection Committee Chair will only be published once the results of the 2005 NCE competition results are made public in order to protect the privacy of peer reviewers during a competition.

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 2003 competition was issued on January 18, 2002 by the Government of Canada to establish new NCEs. University researchers and their private and public sector partners were invited to present Letters of Intent by July 12, 2002; 53 Letters of Intent were received and the NCE Selection Committee met on September 19-20, to complete its review and prepare its recommendation to the NCE Steering Committee. As a result, seven applications were retained and the applicants were invited to submit a full application by March 8, 2003.

The NCE program follows a rigorous peer-review process to evaluate, first, the Letters of Intent and, later, the full proposals 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 proposal is 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, originally planned for April 2003, were cancelled because of the SARS outbreak in Toronto, and replaced with written Questions and Answers and teleconference meetings with the groups of applicants. The individual

Expert Panel reports were submitted to the Selection Committee and were used in elaborating on the final recommendation to the NCE Steering Committee.

COMPETITION PROCESS

January 18, 2002	Announcement of the 2003 competition for new networks in the NCE program.
July 12, 2002	Deadline for submission of Letters of Intent.
September 19-20, 2002	Meeting of the NCE Selection Committee to review Letters of Intent and recommend groups to be invited to submit full applications.
March 7, 2003	Deadline for submitting full applications.
April 2003	Expert Panel reviews of each invited group.
May 22-23, 2003	Meeting of the NCE Selection Committee to review the full applications and make final recommendations on funding to the NCE Steering Committee.
June 18, 2003	Meeting of the NCE Steering Committee to review funding recommendations of the NCE Selection Committee and make a final decision.
July 2003	Public announcement of awarded networks.
Summer 2003	New networks receive first funding of their administrative centre, following the signing of a Memorandum of Understanding.
Fall 2003	Launch of the new networks and the signing of Network and Funding agreements.

NCE SELECTION COMMITTEE FUNDING RECOMMENDATIONS

The 2003 Selection Committee identified the top proposals that exceed the threshold of excellence for the NCE Program. The NCE Selection Committee recommends support for three networks as indicated below in alphabetical order:

Title	Leader Name	Host Institution
Advanced Foods and Materials Network	Rickey Yada	University of Guelph
ArcticNet	Louis Fortier	Université Laval

Third-ranked application²

The Committee, recognizing that the announced budget for the 2003 Competition (~\$12M) is insufficient to fund all three networks, recommends that additional funds be found as soon as possible. Funding these networks, now, is a high priority for Canada.

These networks are recommended for funding through to the point of mid-term review during their Year 4 (2007-08). The Committee advises NCE staff to prepare funding options for the Steering Committee, to match the available budget.

The Committee also identified a fourth proposal that did not meet all criteria of the NCE program but is nonetheless excellent. The Committee, therefore, recommends that funds or other avenues be located to support this proposal as soon as possible.

² Following discussion of the NCE Steering Committee, it was decided that due to limited funds, the top two networks recommended for funding by the NCE Selection Committee would be funded, while the third would be invited to automatically submit a full application in the next (2005) competition, thereby exempting it from having to submit a Letter of Intent.

SUMMARY OF NETWORKS RECOMMENDED FOR FUNDING

Advanced Foods and Materials Network

The Advanced Foods and Materials Network (AFMNet) brings together natural scientists, engineers, health researchers, social scientists and lawyers to work on various facets of food and bio-material advances in a manner that is unique in its field. AFMNet aims to create the next generation of multi-disciplinary scientists and researchers who will be able to actively contribute to large projects where their expertise is necessary to advance the research.

AFMNet addresses three broad themes: the structure, dynamics and function of foods and bio-materials; functional foods and nutraceuticals; and economic, environmental and societal issues (such as regulations and consumer attitudes and perceptions).

For instance, one project will focus on the production of non-latex rubber in sunflowers. Sunflowers produce a small amount of rubber naturally but with genetic modification, commercial-scale amounts may be possible. Even though this creates an alternative use for sunflowers and a value-added component, consumer attitudes come into play. With the recent hype over genetically-modified (GM) foods, will the consumer accept a crop of food-quality oil or seeds from such plants? If used in a medical context, is public opinion towards GM products that might save lives more accepting than in a food application? More than 400 medical devices are made from rubber. Add to that the 7 percent of the population with latex allergies, and the possible economic benefits are enormous.

Functional foods provide health benefits, such as basic nutrition and reducing the risk of chronic diseases. For example, fish is rich in omega-3 fatty acids and can reduce the risk of heart disease. A nutraceutical is any product that has been isolated or purified from foods and that is generally sold in a medicinal form not usually associated with food. Moreover, the product has been shown to provide medical or health benefits (e.g. calcium in relation to osteoporosis).

The research on functional foods and nutraceuticals will have important social and medical benefits. The development and social acceptance of advanced foods represent an exciting opportunity to move away from the traditional

medical—or reactive—model of health care to a preventative model. With health care costs increasing approximately 7 percent annually, the potential savings to the system are in the billions of dollars. For instance, a study has shown that using a nutraceutical that lowers blood cholesterol instead of a pharmaceutical drug can generate savings of more than \$3 billion a year—or 3 percent of Canada’s annual health care budget. Similar savings may be expected for many other diet-related diseases.

Other potential outcomes of the research are: improving healing through better wound dressings; improving food quality by better controlling texture, flavour and colour; improving food safety through the control of biofilms in foods and processing equipment; and increasing public confidence in the food supply by creating the necessary knowledge to help develop and define regulations and laws.

Advanced foods and biomaterials represent a large and growing market—from the molecule through processing and down to the retail level. Current world consumption of natural health products, functional foods and nutraceuticals is estimated at \$70 billion annually. Developments in consumer acceptance and regulatory frameworks will reduce business risk and stimulate investment in this emerging sector.

ArcticNet

ArcticNet connects well-established Centres of Excellence in the natural, medical and social sciences, and their partners in northern communities, federal and provincial agencies, and the private sector to study the impacts of climate change in the Arctic. ArcticNet researchers collaborate with the best research teams in the USA, Japan, Denmark, Sweden, Norway, Poland, the United Kingdom, Spain and Belgium.

Our climate is warming as the sustained combustion of fossil fuel increases the atmospheric concentrations of greenhouse gases (GHG) that trap solar energy. At the present rate, the complete burn-up of the remaining accessible fossil fuel reserves will raise the present average temperature of the globe from 15° to 23°C in the course of the next two centuries. All aspects of our environment and our economy will be deeply transformed. Despite the Kyoto Protocol, there is no indication that this scenario can be avoided. Therefore, societies must brace for the full potential impacts of human-induced climate change. Computer simulations of our future climate indicate that these impacts will start in the Arctic, where warming will be most intense. There are several signs that the Arctic meltdown predicted by computer models is occurring, including a significant temperature rise in the Western Canadian Arctic, a reduction of sea ice cover over the Arctic Ocean, and the degradation of the permafrost.

This meltdown of the Arctic will have tremendous environmental, socio-economic and strategic consequences for Canada. Negative and positive impacts will be felt first and most severely in the High Arctic, before spreading to the southern provinces of Canada. In the marine coastal environment of the Arctic, a reduction of coastal sea-ice already hinders traditional hunting; reduces the habitat of the unique Arctic fauna; increases biological productivity; favours the introduction of new species; and increases coastal erosion, inundation and threat to infrastructures. Moreover, this reduction of coastal sea-ice will soon open the way to intercontinental shipping, thus increasing risks of environmental catastrophes and creating international challenges to Canadian sovereignty over its High Arctic province. In the terrestrial coastal environment, warmer temperatures and permafrost thawing are already destabilizing roads and buildings, and increasing erosion and local floods. They will, however, reduce construction problems and favour an expansion of tourism. In addition, these developments will affect the traditional migration routes of mammals and birds, transform the tundra into bogs and wetlands, extend the northern distribution of plants and insects (both pests and beneficial ones), and alter potable-water and freshwater-resource availability.

ArcticNet will contribute the knowledge needed to formulate impact assessments, national policies and adaptation strategies to help Canada face the environmental and socio-economic consequences of an Arctic meltdown. The direct involvement of northerners in the scientific process is a primary goal of the network. ArcticNet will provide a unique multi-disciplinary cross-sector environment for the next generation of scientists and northerners – something that is urgently needed to ensure the stewardship of a new Canadian Arctic.

Over the next four years and beyond, ArcticNet will conduct Integrated Regional Impact Studies in the coastal marine Canadian High Arctic, the terrestrial ecosystems in the Eastern Arctic, and Hudson Bay. In turn, each Integrated Regional Impact Study will contribute the knowledge needed to formulate policies and adaptation strategies for the Canadian coastal Arctic that address the following concerns of northerners:

- the rate of change of the Arctic environment;
- the reduction of human vulnerability to hazardous events;
- the adaptation of the public health system to change;
- the protection of key animal species;
- maritime transport in an ice-free Canadian Arctic; and
- the economic impacts of environmental change in the Arctic.

APPENDIX I

SELECTION AND EVALUATION 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 the tenure of a grant against these same criteria. **A threshold of excellence must be exceeded for each criterion.** The quality of research is considered first and, unless it is deemed excellent, the network is denied NCE funding. In other words, research excellence is a necessary condition for the initial or continued funding of an NCE. However, it is not the only condition that networks must fulfil in order to be funded or continue to receive funding. Networks must reach a threshold of excellence for each of the other four criteria. The descriptors of the five criteria are given below for the guidance of applicants. They are not all-inclusive.

Criterion 1. 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 a high economic and/or 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.

Criterion 2. Development of Highly Qualified Personnel

- 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 multisectoral research approaches and encourage trainees to consider the economic, social and ethical implications of their work.

Criterion 3. Networking and Partnerships

- Effective research and technology development links between academic institutions, federal and provincial agencies, and private sector participants;
- Multidisciplinary, multisectoral 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.

Criterion 4. Knowledge Exchange and Technology Exploitation

- Likelihood that new products, processes or services can be commercialized by firms operating in Canada and that they 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;
- Effective management and protection of intellectual property resulting from network-funded research.

Criterion 5. 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; and
- effective internal and external communications strategies.

APPENDIX II

TERMS OF REFERENCE FOR THE 2003 NCE SELECTION COMMITTEE

The Selection Committee is responsible for:

- 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 2002);
- Drafting confidential evaluation reports for all LOIs submitted in the competition (September 2002);
- Reviewing invited applications, Questions and Answers documents and Expert Panel reports (March-May 2003);
- Drafting confidential evaluation reports for all invited applications submitted in the competition (May 2003);
- Transmitting to the NCE Steering Committee a list of networks recommended for funding, with the recommended duration and level of award for each network (June 2003);
- Drafting the Chair's Remarks and NCE Selection Committee Recommendations to be included in the NCE Selection Committee's Public Report that provides the rationale for the recommendations along with a summary analysis of each application.

APPENDIX III

MEMBERSHIP OF THE NCE SELECTION COMMITTEE³

³ The membership of the NCE Selection Committee will be published once the 2005 competition results have been announced, to protect the privacy of those members who are also part of the NCE Selection Committee for the 2005 competition.

**APPENDIX IV
BIOGRAPHICAL NOTES
OF THE SELECTION COMMITTEE MEMBERS⁴**

⁴ The biographical notes of the NCE Selection Committee members will be published once the 2005 competition results have been announced, to protect the privacy of those members who are also part of the NCE Selection Committee for the 2005 competition.