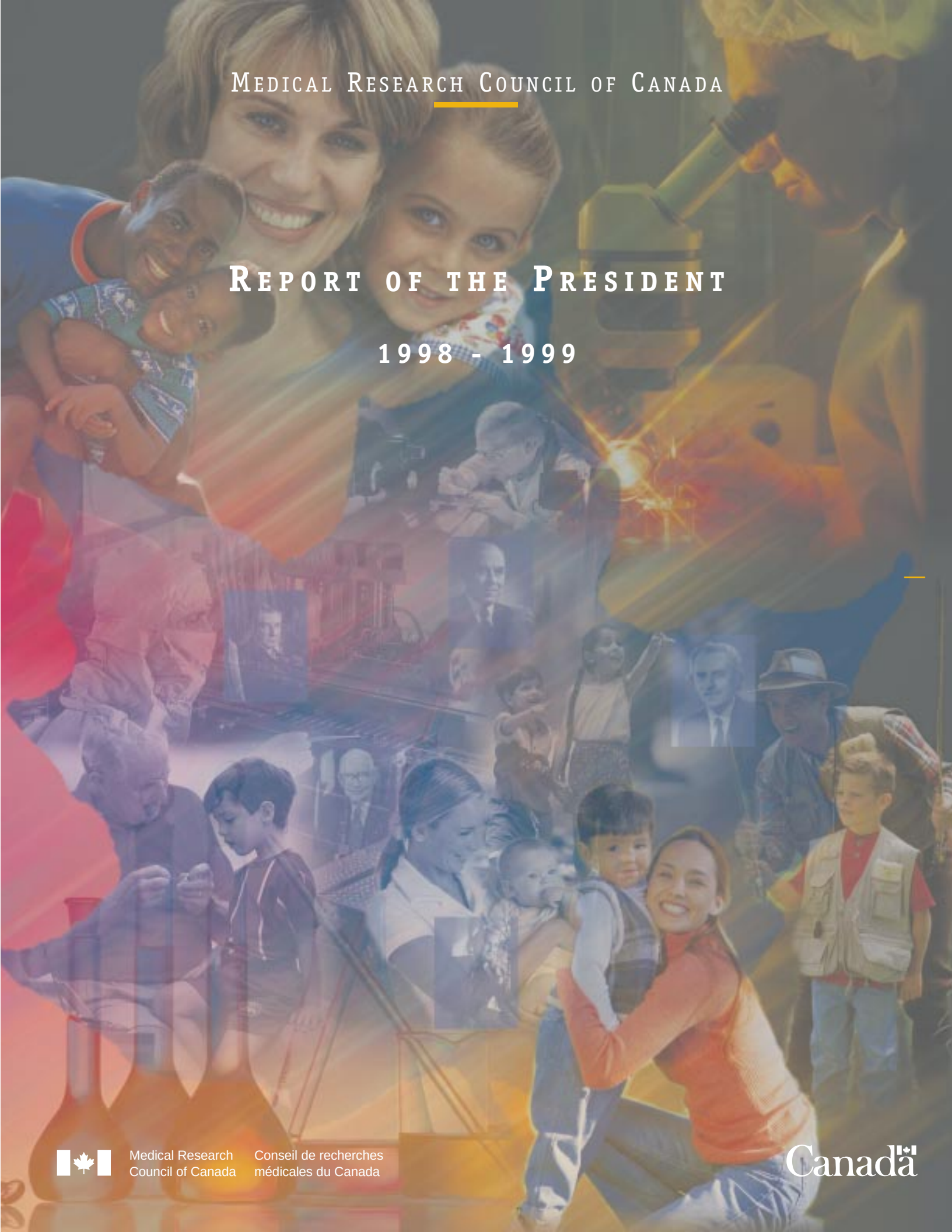

MEDICAL RESEARCH COUNCIL OF CANADA

REPORT OF THE PRESIDENT

1998 - 1999

Medical Research Council of Canada
Conseil de recherches médicales du Canada

Canada

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Medical Research Council of Canada
Holland Cross
Tower B, 5th Floor
1600 Scott Street
Postal Locator 3105A
OTTAWA, ONTARIO, CANADA
K1A 0W9

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Medical Research Council of Canada
Conseil de recherches médicales du Canada

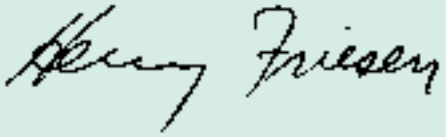
December 15, 1999

The Honourable Allan Rock, P.C., M.P.
Minister
Health Canada
Ottawa, Ontario
K1A 0K9

Dear Sir:

In accordance with the requirements of the Medical Research Council Act, I have the honour to present to you herewith the Report of the President of the Medical Research Council for the fiscal year 1998-99.

Yours sincerely,



Henry Friesen, M.D.
President

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President's message

Then and Now, an Investment in Health

Henry Friesen, M.D.

Strength, enthusiasm, renewal - all aptly describe the atmosphere in Canada's health research sector in 1998-99 - and apply to the remarkable coalition of interests at work in the field. At the Medical Research Council of Canada (MRC), 1998-99 will be remembered as a turning point when the federal government, recognized the importance of national health needs and gave the go-ahead for the establishment of the Canadian Institutes of Health Research (CIHR).

In his budget of February 16, 1999, Finance Minister Paul Martin announced a series of measures designed to strengthen Canada's health care system, improve the health of Canadians and expand health research. Acknowledging that research is an indispensable part of improving health, and therefore, a good investment, the government endorsed the development of the Canadian Institutes of Health Research (CIHR). As President of MRC, I have been entrusted with a new mission, which is to chair the Interim Governing Council responsible for offering advice to the Minister of Health on the establishment of the CIHR. It is expected that legislation will be tabled this year to enable the formation of CIHR on April 1, 2000, at which time MRC will become part of the new organization.

The creation of the CIHR is the culmination of the efforts of a task force composed, for the most part, of stakeholders in the health research field. A transitional budget of $27.5 million for this year and each of the two subsequent years was also announced. CIHR is also expected to receive $65 million in 2000-2001 and an additional $110 million the following year, bringing the annual budget of CIHR to $484 million.

CIHR will transform health research in Canada into a modern, innovative, multi-sectoral enterprise that will set new standards of excellence. It will enable researchers to aim higher, and meet the expectations of Canadians better than ever before. I would like to thank the federal government for providing us with the means of achieving these goals. I am delighted at the prospect of seeing Canada take this important step into the future, and look forward to working more effectively through CIHR to improve the lives of Canadians.

After all, the health of Canadians is what this transformation is all about. MRC, the federal agency with primary responsibility for funding, promoting and sustaining basic, applied and clinical research in the health sciences sector, has played a major part in efforts to obtain adequate resources for Canada's health research sector. Throughout its forty year history, MRC has taken this supporting role seriously, by funding the best projects and by creating training and partnership programs to ensure that excellent research and researchers are promoted. The direction laid out in the 1993 strategic plan, *Investing in Canada's Health*, means developing closer links with Canadians and governments in order to effectively mobilize the vital forces which make up our research establishment and deploy them for the greater benefit of the population. "Investing in Health" also means contributing to the protection and enhancement of the health of Canadians by supporting research in every corner of the country in such fields as genetics, cancer, memory, as well as heart, lung and blood diseases, aging and nutrition. Finally, "Investing in Health" means ensuring that beyond political, cultural or geographic divisions, Canadians support researchers, recognize the value of their work and endorse the assistance which their government provides.

Then and now, a common theme has characterized MRC's role. Not only has MRC fostered improved health through research, but it has also influenced how Canadians view their own health. People are not just living longer

and receiving better care when they are ill, but they are also more aware of the importance of prevention and of taking responsibility for their own well-being.

Then and now, MRC has been both witness to and agent of an unprecedented and rapid evolution in Canada's research-generated knowledge base. Inevitably, such change has necessitated alterations in the structures and concepts of health research. In response to these changes, the Canadian government has developed a comprehensive strategy, which it unveiled in its 1999 Budget, "Building today for a better tomorrow." For the health sector, "building today" means providing a new research framework. The government is now providing the means to effect this strategic transformation. In the years ahead, we will have the responsibility of taking part in the establishment of the Canadian Institutes of Health Research. Through these changes and the dedication of our researchers, who will enjoy increased support under the new research structure, a better tomorrow is indeed attainable.

The end of the century and the dawn of a new millennium have provided the impetus for large-scale projects and we intend to take full advantage of this momentum. It is also an auspicious time to take stock of our past accomplishments. I would ask readers to stand back from the momentous changes which are bringing renewed energy to health research in Canada, and consider the transformations that have taken place over time in the structures and values which form the basis of MRC's relationship with Canadians and the vast health research community.

This report will review past achievements and key events in the development of the Medical Research Council. Moving from then to now, we will look at what MRC has accomplished over the past year, as well as the series of events which have led to the restructuring of health research in Canada around the concept of institutes of health research. Finally, this report will consider future challenges in building a research infrastructure and improving the health of Canadians as we enter the new millennium.

Then...

Formative Steps

Although the MRC was officially created on July 4, 1960, its origins go back to the 1920s, when University of Toronto scientists **Frederick Banting**, **J.J.R MacLeod**, **J.B. Collip** and **Charles Best** produced the research which led to the discovery of insulin. This major event in medical history proved that Canada had world-class researchers worthy of government support and encouragement. In 1936, thanks to the perseverance of Dr. Banting, the National Research Council of Canada (NRC) established the Associate Committee of Medical Research, with the backing of the Canadian Medical Association and the Royal College of Physicians and Surgeons of Canada. Banting was appointed the first Chair of this Committee, which was largely made up of representatives of medical schools.

During the Second World War, the war effort dominated research concerns. The Associate Committee of Medical Research was divided into several sub-committees, each dealing with a specific aspect of war-related research. After the war, researchers resumed their earlier projects and were free once again to focus on basic research. In 1946, the Associate Committee was replaced by the NRC Division of Medical Research, headed by **J. B. Collip**, one of Banting's colleagues.

A developing framework

In 1957, the Association of Canadian Medical Colleges urged the newly-elected government, led by John Diefenbaker, to increase medical research funding by at least $500,000 in its first budget. The government responded by providing an increase of $629,000. By 1959-60, government funding had risen to $1.5 million.

Subsequently, a special committee was formed, chaired by **Dr. Ray Farquharson**, to conduct consultations and table recommendations. The committee called for the establishment of a medical research council under terms similar to those of NRC, with an initial budget of $4 million.

In 1960, the government responded to these recommendations by establishing the Medical

Research Council of Canada and endowing it with its own administrative structure and a budget of $2.3 million.

The Council took over the programs of grants and scholarships that had been administered by the NRC's Committee of Medical Research. It made special efforts to strengthen medical research in universities, for example, by providing general research grants to the dean of every faculty of medicine in Canada in order to further the development of medical research. In 1963, a scholarship program was established, providing talented young researchers with the means to conduct independent research after completing their formal training.

Following the death of Dr. Farquharson, which occurred during a Council meeting in 1965, his successor, **Dr. G. Malcolm Brown**, began his tenure with 20 years of experience in medical research and a considerable knowledge of MRC. Brown built upon the useful conceptual framework, as well as the goals, assessment mechanisms and administrative procedures established by Farquharson and the Council's founding members. Aware of the shortage of qualified research scientists in medicine and biomedicine and the scarcity of resources for medical research, Brown strove to give Canada the skills, facilities and funding mechanisms required to meet the growing need for health-related research.

Formal establishment

In 1969, the Medical Research Council of Canada Act created the MRC as an autonomous crown corporation, reporting to Parliament through the Minister of National Health and Welfare. During the decade from 1960 to 1970, the MRC budget increased fifteen-fold, the number of schools of medicine went from 12 to 16 and MRC funding parameters were broadened to include 10 schools of dentistry, 8 schools of pharmacy and a school of veterinary medicine. During the next decade, MRC assumed a leadership role in the area of ethics, developing and publishing a set of guidelines on both the ethics of research involving human subjects and genetic engineering.

Despite the financial limitations of its early years, MRC was determined to support high quality research. The Council pressed forward with a number of new initiatives, including support for perinatology and the establishment of program grants to promote multidisciplinary research. In 1971, a clinical trials grant committee was established to support research in the potential benefits and drawbacks of new diagnostic and treatment protocols.

Dr. Brown was determined to develop programming appropriate to the Canadian health research enterprise. His tenure saw an increased focus on the quality of Canadian biomedical research and the development of assessment and support procedures which won widespread acclaim. Dr. Brown viewed the development of research as a vital part of improving the information base available to Canadian health care practitioners.

Developing and maintaining a research infrastructure for Canada

In 1977, **Dr. Jean de Margerie** of the Université de Sherbrooke served as acting president for a year until the appointment of **Dr. René Simard** in 1978. Dr. Simard held the presidency for three years before stepping down to return to his position at the Cancer Institute of Montreal. During his term, Dr. Simard oversaw the gathering of data from medical schools and other research facilities and was particularly concerned about the declining number of clinician-scientists. A substantial increase in MRC's budget for 1981-82 attested to the success of his efforts to improve the resources and support mechanisms available for biomedical research.

The importance of planning as a critical tool in the funding of medical research was fully recognized under the leadership of **Dr. Pierre Bois**, formerly Dean of Medicine at the Université de Montréal. He assumed the presidential mantle in April 1981 and served two five-year terms. Under his leadership, the Council developed its first five-year plan. The plan was adopted by government and by the end of the decade, MRC's budget had tripled from $70 million to $202 million. Although challenged by high inflation in the early 1980s, and a growing demand for medical research funds, MRC successfully developed new research support mechanisms, including the MRC Scientist program and a new biotechnology training program.

By the late 1980s, the federal government began to emphasize the importance of science and technology to a healthy economy. It recognized the need to supplement government funding of medical research and find new ways of working with the private sector and industry. MRC responded by developing and implementing the University-Industry Program in 1987. Throughout the decade there was a growing trend toward supporting multidisciplinary research as well as the work of individual researchers. MRC's program grants mechanism supported increasing numbers of research teams as well as a new Clinician-Scientist program developed in 1989.

During Dr. Bois' tenure, there was an ongoing examination of MRC's peer review system aimed at keeping it relevant and up-to-date. Today, this system stands as a model of effectiveness and has been taken up by various organizations in Canada and abroad. It is important to remember that the peer review system depends on the efforts of thousands of Canadian researchers who have given of their time over the years to participate in the work of MRC committees.

The progress in funding and program development achieved under Dr. Bois' leadership provided the impetus for new growth in biomedical research. The work accomplished by MRC during this period was recognized in 1985 by Winnipeg's St. Boniface General Hospital Research Foundation, which awarded the Council its international prize for significant contributions to the development and support of research in medicine, pharmacy and dentistry across the country.

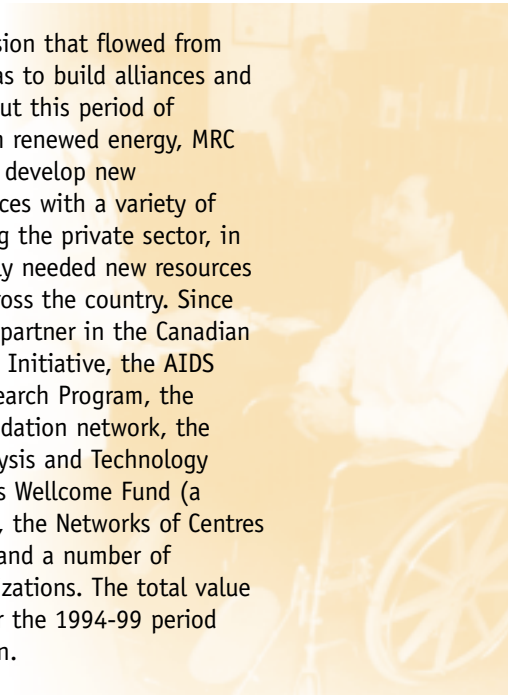
Dr. David Hawkins, then Dean of Medicine at Memorial University, served as Acting President of MRC for several months following the completion of Dr. Bois' term.

Preparing for the 21st century

My arrival in 1991 coincided with a time of change for MRC. Within a few months, the Council undertook its first strategic planning exercise examining all of its operations, to respond better to the challenges of the 21st century. Extensive consultations and workshops involving more than 4,000 people were held over a five-month period. These activities culminated in a national workshop in Ottawa where two major decisions were taken. The first was a decision to expand MRC's support to the full range of health research, extending its coverage of research to include psycho-social factors, population health, health services and health care delivery**.** In its 1993 strategic plan, *Investing in Canada's Health*, the MRC set out to become a broad health sciences research council.

This expansion of MRC coverage to embrace the full spectrum of health research was not easy because it occurred as the government of this period began to face the stark reality of growing deficits and debt. Budgets for most federal departments and agencies were reduced, including that of MRC and the other granting councils.

Productive partnerships



The second major decision that flowed from MRC's strategic plan was to build alliances and partnerships. Throughout this period of budgetary decline, with renewed energy, MRC increased its efforts to develop new partnerships and alliances with a variety of organizations, including the private sector, in order to attract urgently needed new resources to support research across the country. Since 1993, MRC has been a partner in the Canadian Breast Cancer Research Initiative, the AIDS Initiative, the Eco-Research Program, the Juvenile Diabetes Foundation network, the Canadian Genome Analysis and Technology Program, the Burroughs Wellcome Fund (a private US foundation), the Networks of Centres of Excellence program and a number of voluntary sector organizations. The total value of MRC partnerships for the 1994-99 period stands at $1.145 billion.

In 1997, a task force composed of representatives of all three councils ensured that a common approach to ethics across disciplines was developed. MRC undertook a review of its ethics guidelines in consultation with the Social Sciences and Humanities Research Council (SSHRC) and the National Sciences and Engineering Research Council (NSERC). For many years, MRC had provided leadership to the field of medical research ethics under the direction of the Chair of its Standing Committee on Ethics, Justice David Marshall. In September 1998, the three

councils published their policy statement, which provided a solid foundation for the work to come in the area of research ethics in Canada. For its part, MRC established a working group to identify the points at which ethical issues are dealt with as universities and industry interact in the conduct of clinical trials of new medicines.

MRC launched the Regional Partnerships Program in 1996 in order to offset the steep decline in the funding of health research in the health science faculties of the less populous provinces (Saskatchewan, Manitoba, Nova Scotia and Newfoundland). This five-year, $10 million program, in addition to funding additional research grants, also supported the recruitment of promising young scientists whose discoveries may, in turn, attract new sources of funding.

MRC has provided leadership in its support for genomic research. As part of Genome Canada and the larger global effort known as the Human Genome Project, the MRC Genomics Research Program (GRP) has as its goal to study human and other genomes. The program provides for the development of research-related technology and tools, as well as an examination of the medical, ethical, legal and social issues raised by this form of research. In July 1998, after considering a Task Force report on the project, MRC Council committed $5 million per year over five years to help attract other partners, the ultimate goal being to develop a research program supported by an annual budget of $50 million.

New programs have contributed to an expansion of the Canadian health research resource. For example, the MRC-Rx&D Health Program[1] has, to date, attracted approximately $208 million from members of Canada's Research-Based Pharmaceutical Companies, including $33 million[2] from MRC, for personnel and research projects initiated by MRC scientists and evaluated by MRC peer review committees.

Since 1994, another initiative, the Canadian Medical Discoveries Fund, a venture capital program to raise funds for the commercialization of Canadian health research discoveries has raised more than $250 million. Funds are invested in Canadian companies to bring Canadian academic research discoveries to the market. To date, a total of $150 million has been directly invested in over 40 companies.

Budgetary instability

Because federal funding has fluctuated throughout its history, MRC has often had to face the challenge of fulfilling its mandate to support health research with limited resources. The 1990s have been particularly difficult. The federal budgets of 1995 and 1996 cut 10% from MRC's operating funds, followed by a further 3% decrease for 1997-98. By 1998, this represented a $31 million reduction in annual funding and placed considerable pressure on research funding programs.

Primarily as a result of MRC's efforts, and in keeping with its strategic decision to embrace the full spectrum of health research, the government established the $65 million Canadian Health Services Research Foundation (CHSRF) to support research on health services. As a founding partner, MRC agreed to contribute $2 million a year to CHSRF for five years. The following year, 1997, saw the creation of the Canadian Foundation for Innovation (CFI), with a budget of $800 million earmarked for investments in research infrastructure for universities and hospitals. Taking into account partnerships with other levels of government and the private sector, this represents an investment of more than $2 billion, about 50% of which is directed to infrastructure related to health research.

Mindful of the growing concerns expressed by the scientific community as budget cuts took their toll, in 1995 the Council decided to obtain an external assessment of all its operations. This approach was a first in the history of Canadian federal granting councils. An international review panel was entrusted with three tasks: first, to review program and policy effectiveness in fulfilling MRC's mission (particularly in pursuing the specific objectives of its strategic plan); second, to examine the efficacy of the relationships between MRC and other participants in the health sciences sector in Canada; and third, to prepare a report and recommendations.

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1 The former Pharmaceutical Manufacturers' Association of Canada (PMAC) is now Canada's Research Based Pharmaceutical Companies (Rx&D).

2 As of July 1999.

The panel concluded that MRC was an outstanding agency doing first-rate work in increasingly challenging circumstances. It reported that the Council had taken a strategic view of its role and mission and was committed to responding positively to emerging challenges. It also complimented MRC for actively pursuing joint ventures with a variety of public and private organizations.

The panel endorsed MRC's efforts to diversify the sources of support for health research and stated that it had found no material evidence to support the concerns of some in the scientific community that the development of alternative funding pathways had occurred at the expense of the Council's core budget. At the same time, however, it observed that the new funding pathways had not halted or offset the ravages of government cutbacks.

In 1997-98, MRC's budget of approximately $237 million was clearly inadequate to meet present or future research needs. Intensive support for MRC, particularly by the health research community across Canada, convinced the federal government to restore the Council's core funding with an increase of $130 million over three years, along with $276 million to the two other research granting councils.

A grateful Council quickly approved 109 additional operating grants, extended the funding of 26 others, restored a clinical trials competition, funded all approved equipment grants and reduced the cuts applied to project budgets. All measures were applied retroactively to the September 1997 competition, increasing the success rate for the competition by 50% and greatly heartening Canada's health-research community.

Council was also able to increase funding for the March 1998 competition, providing additional money for equipment grants, salary and training awards and various other initiatives designed to attract funding in partnership with health research charities.

As the major federal government agency responsible for funding health research in Canada, MRC offers a range of programs which currently supports more than 10,000 scientists and staff as they endeavour to advance our knowledge, deepen our understanding of the health sciences and, above all, improve the health of Canadians.

Significant advances

As it prepares to undergo a transformation that will change the face of health research in Canada, MRC can take pride in the course it has charted and in its achievements in health research. In four short decades, MRC has gone from being a division of the National Research Council of Canada responding to short-term medical research demands, to being a forward-looking, effective and strategic organization which has succeeded in advancing health research in Canada. MRC's promise of *Investing in Canada's Health* has not been an empty slogan. "Investing in Health" will require us to harness change and turn it to our advantage. As Canada charts a new course in health research, MRC employees and researchers, past and present, can take pride in achieving their mission of improving the health of Canadians through scientific excellence in health research and researcher training.

Research Achievements

Most Canadians understand that research is responsible for the remarkable advances in medical science which have occurred in recent decades. Basic research projects have yielded health benefits such as improved diagnostic methods, drugs, treatment methods, surgery and effective disease control and prevention programs. For more than 40 years, MRC has funded a variety of research initiatives which have contributed to improving not only the health of Canadians, but, in many cases, the health of millions of people around the world. As we take stock of MRC's activities, it is important to review its major achievements in these areas.

The early years

Canadians began to value medical research in the early days of the 20th century when the benefits of the smallpox vaccine became evident. In 1921, the discovery of insulin made **Frederick Banting, J.B. Collip, J.J.R. Macleod** and **Charles Best** world famous and gave Canada its first Nobel Prize.

In the late 1930s, **W.E. Brown** of the University of Toronto demonstrated the value of bromide and ethyl chloride as anaesthetics. It was also during the 1930s and 1940s that **Wilder Penfield**, the eminent neurosurgeon and founder of the Montreal Neurological Institute, developed a brain-mapping technique that paved the way for modern neurology and the treatment of diseases affecting the central nervous system. Brain mapping permitted the surgical treatment of epilepsy, which became known around the world as the "Montreal method". At McGill University in 1942, **Harold Griffith**'s use of the muscle relaxing properties of curare, a plant extract also known as intocostrin, advanced the science of anaesthesiology. The work of **Hans Selye** at McGill provided the link between stress and disease and gave rise to the concept that the response to stress was an integral part of the body's defence system against disease. In the early 1950s, the **Connaught Laboratories** at the University of Toronto played an essential role in developing a polio vaccine to combat a poliomyelitis epidemic that threatened thousands of Canadians.

It was these successes, and the growing interest in medical research in Canada, that prompted the federal government to fund research studies, and led, eventually, to the creation of MRC. Over the years, the Council has funded a wide range of projects, from biomedical research to research into physical and mental health to fundamental laboratory research and applied research. Among the thousands of researchers funded by MRC, most of those listed below have been recognized by inclusion in the Canadian Medical Hall of Fame and/or with the prestigious Gairdner Foundation International Award.

- **Albert Aguayo** proved the seemingly impossible in 1980 by regenerating and regrowing damaged nerve cells from the spinal cord and brain in animals at the Montreal General Hospital. He discovered that nerve cells can regenerate if provided with the proper environment. This breakthrough has been part of a global effort to understand nerve regeneration factors as a means to prevent permanent disability following brain injury, stroke and spinal cord injury.

- **Henry Barnett,** at the University of Western Ontario, and **John Cairns, Mike Gent and Wayne Taylor** of McMaster University, have studied the effects of aspirin in preventing cerebrovascular accidents. Dr. Cairns has also conducted an important study into unstable angina. More recently, Professor Gent has invited researchers around the world to study clopidogrel, a new anti-clotting agent which his own research has shown to be more effective than aspirin.

- **Murray L. Barr's** identification of the sex chromatin body, now known as the Barr body, initiated a new era in research and diagnosis of genetic disorders. His work at the University of Western Ontario led to a greater understanding and ability to manage certain disorders that are associated with mental retardation.

- **Charles Thomas Beer's** major contribution to medicine was the isolation of the anti-cancer drug, vinblastine, at the University of Western Ontario in 1958. He worked closely with **Robert L. Noble** to isolate and purify vinblastine from the leaves of the Madagascar periwinkle plant, *Vinca Rosea*. While Noble discovered the compound, it was Beer, the chemist, who isolated vinblastine, one of the most useful chemotherapeutic agents available. Their work is considered to be a milestone in the history of cancer chemotherapy.

- **John S.L. Browne's** lifetime interest in endocrinology began while working under J.B. Collip, one of the co-discoverers of insulin. At McGill University, he began isolating oestrogenic hormones from placental tissue, and pursued steroid research until becoming chairman of the Department of Investigative Medicine in 1955. During his tenure at McGill, the university created a diploma program for clinical investigators - physicians who sought postgraduate degrees in order to become medical researchers.

- **Bruce Chown**, a pathologist at the Winnipeg Children's Hospital, devoted his career to understanding and treating erythroblastosis fetalis caused by a fetal blood factor commonly known as the Rh

factor. He subsequently set up the Rh Laboratory to manufacture Rh immune serum under license in 1968. Thanks to Dr. Chown's work, the vast majority of potential Rh disease in Canada and around the world was eliminated.

- In 1961, at the University of British Columbia, **Harold Copp**'s research into hormones led to the discovery of calcitonin, a hormone which regulates the level of calcium in the blood and is used in treating patients with bone disease.

- **Charles Drake**, a neurosurgeon at the University of Western Ontario, gained international recognition for developing surgical techniques for treating ruptured basilar aneurysms located deep within the brain.

- As one of the early scientists to introduce computers as a tool for medical research, **Claude Fortier's** research at Laval University focussed on neuroendocrinology. At the time of his death in 1986, Dr. Fortier was considered a world expert in the hypothalamo-pituitary-adrenal cortex axis.

- A team led by **Henry Friesen**, then at McGill University, discovered the human hormone prolactin and developed a simple blood test to identify patients with tumours that secrete excessive amounts of the hormone. This research enabled the successful treatment of many thousands of women and men with reproductive disorders related to prolactin.

- After years of working with children suffering from retinoblastoma tumours at the Hospital for Sick Children, in Toronto, **Brenda Gallie** developed a simple blood test to screen for retinal tumours that was faster and less complex than previous diagnostic techniques. She has developed the best treatment yet to prevent blindness and to cure retinoblastoma tumours without losing the eye.

- **Jacques Genest**, founder and scientific director of the Clinical Research Institute of Montreal, became the pre-eminent Canadian investigator of the cause and treatment of high blood pressure, exploring the roles of the adrenal gland and kidneys. He was the driving force behind the creation of what today is the Fonds de la recherche en santé du Québec (FRSQ).

- **Gustave Gingras** was a strong advocate for the rights of the handicapped from his medical research days at the Veteran's Hospital in Montreal. He lobbied government and social institutions to provide access, facilities for the handicapped and legislation that would integrate handicapped people into the work force and children into the public school system. Gingras also started a Canadian program to assist child victims of thalidomide.

- At the Montreal Neurological Institute, **Herbert Jasper** advanced the use of the electroencephalograph (EEG), a device used to observe the electrical activity of the brain and locate the sources of brain disorders including epilepsy, brain tumours and brain injury.

- Prior to **Harold John's** invention and development of the Cobalt-60 machine at the University of Toronto, cancer radiation therapy could only reach superficial tumours. His new machine, which could treat deep-set tumours that were difficult to access, had an immediate impact on cancer survival rates.

- McGill's **Charles P. Leblond** was responsible for the development of a number of essential techniques in the field of anatomy and cell biology. The technique of autoradiography, which he pioneered, has been critical in allowing researchers to visualize radioactively labelled tissues and/or cells under the microscope. Over four decades, his hundreds of original articles in histology have increased our understanding of differential rates of turnover of cells in the body.

- **Julia Levy**, a world-renowned immunologist associated with the University of British Columbia, is conducting research into porphyrins,

organic compounds that are normally broken down and excreted in healthy humans, but which have a tendency to accumulate in cancerous cells. The research involves injecting porphyrins into human tissue, then illuminating them with a fibre-optic laser. This causes the porphyrins to become toxic and destroy cancer cells while sparing healthy tissue.

- As a leader in respiratory research at McGill, **Peter T. Macklem** pioneered the study of small airway function and identified the early pulmonary damage caused by smoking.

- University of Toronto researcher **Tak Mak** discovered T-cell receptors in 1983 and went on to clone and sequence the gene for these receptors. He described T-cells as scavengers seeking to destroy toxic substances including infectious agents. The receptors are the surface recognition sites that "lock in" on the targets to be destroyed.

- **Brenda Milner's** neuropsychology research at the Montreal Neurological Institute involved detailed and methodical long term studies of patients before and after well documented brain surgery, particularly in epilepsy cases. As a founder of the McConnell Brain Imaging Centre in the 1980s, her work focussed on reducing damage to language skills caused by brain surgery. Today, the Centre is particularly interested in the role of the specific regions of the brain involved in the organization of learning, memory and speech.

- In 1960, at the Hospital for Sick Children in Toronto, orthopaedic surgeon **Robert Salter** developed the "Salter Operation" for hip dislocation in children, still used worldwide. Among his many innovative orthopaedic treatments, Salter recognized the therapeutic effectiveness of continuous passive motion to the repair of cartilage injuries, a finding which has been translated into clinical application throughout the world.

- **Charles R. Scriver** of McGill University and the Research Institute of the Montreal Children's Hospital led an MRC-supported research team that has contributed important new knowledge to the field of genetics. From these insights, new public health measures were introduced such as the addition of Vitamin D to milk which led to a major decrease in the incidence of rickets among children in Quebec.

- At the University of Toronto, **Louis Siminovitch** was instrumental in developing and promoting the field of genetics. He was the Founding Director of the Samuel Lunenfeld Research Institute at Mount Sinai Hospital. He recruited, influenced, and trained many of Canada's leading researchers in the field of genetics.

- In 1993, **Michael Smith**, a professor at the University of British Columbia and a career investigator with MRC since 1966, received the Nobel Prize for chemistry for his work in the field of genetic engineering. Dr. Smith developed a technique, known as site directed mutagenesis, which provided a method for modifying genes in a predictable fashion. The discovery provided an important tool that can be applied to better understand diseases such as cancer, as well as bacterial and viral infections.

- University of Toronto molecular geneticist **Lap-Chee Tsui** discovered the gene that causes cystic fibrosis. His work is now the basis of international research efforts to find a cure for this disease.

- At the University of Alberta, **Lorne Tyrell** developed a technique using duck liver cells to screen for molecules that might be effective antiviral agents. Using this screening method, he identified that a molecule supplied by his industrial collaborator proved to be effective in killing the Hepatitis B virus. The pharmaceutical, Lamivudine, is now available in markets worldwide.

These examples represent only a small fraction of the high quality work, both past and present, performed by Canadian researchers with the financial support of MRC. Canada's thousands of health science researchers have advanced our knowledge of disease and the factors which not only promote more effective

treatments, but also contribute to short and long-term health. To their commitment and dedication over the years we owe many of the scientific advances we now enjoy.

Now...

MRC continues to expand the research it supports, covering the full spectrum of health research in Canada, including basic biomedical, clinical, health services and health systems, psychosocial and population health. A brief look at recent research funded by MRC illustrates the importance of support for health research in improving the lives of Canadians. Only when combined with the hundreds of other MRC supported health research projects across Canada, can a true sense of the rich portfolio of scientific excellence that exists in every province across the country be fully appreciated.

Brain and motor function

- **Yves Lamarre** and a team of researchers at the Université de Montréal are studying motor diseases in the hope of developing better treatments to control tremors, and gaining new knowledge of normal motor functions and motor learning.

- Since 1994, a test designed by **Judes Poirier** of McGill University has been used to track people who carry the gene associated with Alzheimer's disease in order to assess their chances of developing the disease.

- **Harold Robertson** of Dalhousie University is studying the phenomenon known as "kindling" that occurs when the brain works differently because of activity in the brain cells. Kindling is usually associated with a part of the brain called the hippocampus which has a central role in memory. Understanding kindling could teach us a great deal about epilepsy.

- At the research centre of Hôpital Côte-des-Neiges in Montreal, a group directed by **André Roch Lecours** revealed new findings concerning the effects of aging on brain functions. Researchers have discovered that normal aging can have an impact on almost all aspects of linguistic behaviour.

- University of Alberta researchers **Richard Stein** and **Arthur Prochazka** are pioneers in the emerging field of functional electrical stimulation. Stein's research has led to the development of electrodes which can be implanted beneath the skin in order to establish permanent transmission of electrical signals between deep muscles and myo-electric prosthetic devices. This "touch control" technique has enabled amputee musicians to continue to play. Prochazka has designed a bionic glove for quadriplegics that stimulates the muscles and nerves of the wrist in order to trigger thumb and index opening and closing motions.

Cancer

- **Kristan Aaronson** of Queen's University is investigating environmental pollutants as risk factors for various types of cancer, including prostate cancer. She and her colleagues found the first evidence that PCBs and certain pesticides may cause breast cancer.

- A McMaster University research team, including **Silvia Bacchetti** and **Chris Counter**, may have discovered a new way of fighting cancer by blocking telomerase, an enzyme linked to the disordered proliferation of malignant cells. The team is hoping to test a drug designed to block this enzyme function and shorten the lifespan of cancerous cells.

- In 1998, a University of Toronto team comprising Drs. **Jeffrey Charuk**, **Reinhart Reithmeier** and **Arthur Grey** discovered that nonylphenolethoxylate, a synthetic detergent found in household cleaning products, may be effective in treating chemotherapy-resistant cancer. Due to its ability to penetrate liver cells, the substance may slow down the elimination of chemotherapy drugs, thereby increasing their effectiveness.

- One of the major obstacles to curing many cancers is their ability to develop resistance to a wide range of drugs. **Susan**

Cole and **Roger Deeley** of Queen's University found a gene that makes a protein which appears to be responsible for this drug resistance. By shutting off this gene, it is conceivable that the cancer cell would be rendered more vulnerable to conventional treatments.

- **Patrick Lee** of the University of Calgary is looking into the molecular basis for attacking cancer cells with the human Reovirus. Early findings showed that this unconventional approach could attack the cancerous cells much more aggressively while avoiding harm to normal healthy ones. It is expected that clinical trials will confirm this new approach to cancer treatment.

- **Victor Ling**, now at the BC Cancer Control Agency**,** discovered a mechanism in the cell membrane that allows cells to pump out toxins and helps to explain how cancer cells can become drug-resistant. His discovery has led to an international effort to find ways to block or disable this molecule as a means of overcoming resistance to anticancer drugs.

- At Mount Sinai Hospital's Samuel Lunenfeld Research Institute, **Anthony Pawson's** laboratory continues to examine the process of signal transduction in normal and cancerous cells. A particular focus of the lab involves the activation of intracellular signalling pathways by tyrosine kinases, and the functions of protein domains, in controlling protein-protein interactions in intracellular signalling.

- **Linda Pilarski** and a team of researchers from Toronto and the University of Alberta have discovered that the toxin produced by E. coli bacteria, usually associated with undercooked meat, can penetrate cancer cells and prompt them to self-destruct.

- **Karl Riabowol** of the University of Calgary has discovered a gene that could shorten the life of cancer cells by eliminating them as they appear. His research focusses on finding out how cancer cells avoid this gene and discovering how to counter this phenomenon.

Cardiovascular disease

- **Jack Hirsh** and his team of researchers at McMaster University are leaders in developing treatments for thrombosis. Their most noteworthy achievements include demonstrating that low molecular weight heparin and warfarin can effectively prevent deep venous thrombosis and pulmonary embolism.

- **Salim Yusuf** and his colleagues at McMaster reported this year in the HOPE Study that using beta blockers, aspirin, thrombolytic (clot-buster) agents and ACE-inhibitors (a special kind of blood pressure lowering agent), substantially improved survival after heart attack and reduced the risk of subsequent heart attacks. Yusuf is also part of the SHARE study (with the MRC and Heart and Stroke Foundation of Ontario) which is examining 1000 people from Toronto, Edmonton and Hamilton in an effort to find out if genetic or lifestyle differences are behind markedly differing risks for heart attacks among different ethnic groups.

Diabetes & endocrinology

- **Michel Chrétien**, at the University of Ottawa Loeb Institute, and **Nabil Seidah** at the Clinical Research Institute of Montreal are world leaders in the new field of the convertases, which can be found in diseases as widespread as cancer, AIDS, and Alzheimer's. Applications of this new knowledge could lead to novel rational therapeutical approaches in a number of conditions including cancer, neurological and endocrine disorders, proliferative diseases and infections.

- **Fernand Labrie**, of the University of Laval is one of Canada's preeminent endocrine researchers. He has introduced new approaches and better treatments for prostate and breast cancers. One of these depends on a new class of estrogen blockers which were developed and synthesized in the Centre de recherche du Centre hospitalier de l'Université Laval.

- **Ji-Won Yoon**, at the University of Calgary, has found a trigger for diabetes — an

enzyme produced in cells in the pancreas, called glutamic acid decarboxylase (GAD). Children who develop diabetes have an off-kilter immune system that allows that body's infection-fighting T-cells to attack the GAD enzyme when they should not, harming the pancreas and destroying the body's ability to produce enough insulin, resulting in Type 1 diabetes. He has developed a GAD vaccine for newborns that would build up a tolerance for the enzyme among T-cells and prevent them from destroying GAD later.

Genetics

- Understanding what each of the 100,000 plus proteins in cells do at the molecular level and how they interact with other proteins is the focus of the new science of proteomics. **John Bergeron** and his team at McGill University are taking a collaborative proteomics approach to determine the entire repertoire of proteins which make up cellular compartments. His studies have led to the discovery of various molecules including a protein called calnexin, which is believed to play a role in cystic fibrosis and juvenile hereditary emphysema.

- At the University of Calgary, **Leigh Field** has identified a number of disease-related genes. One determines susceptibility to diabetes and another makes people likely to inherit dyslexia, the leading learning disability in North America. This newly identified gene increases scientific understanding of dyslexia and may eventually mean that genetic screening could identify children with the condition early enough to allow them to receive assistance with reading and writing before they attend school.

- **Philippe Gros** of McGill University is performing insightful research in the area of molecular genetics. Among his accomplishments, he cloned two genes — the mdr gene, which is responsible for resistance to multiple anti-cancer drugs and the bcg gene, which appears to control natural resistance to a variety of infections that cause diseases such as tuberculosis, salmonella poisoning and leprosy. His discovery holds out the promise of finding new ways to counter such diseases and of using sophisticated gene therapy to enhance the body's disease-fighting mechanisms.

- **Peter St. George-Hyslop**, a Professor of Medicine (Neurology) and Director of the Centre for Research in Neurodegenerative Diseases at the University of Toronto, was the first to demonstrate that Alzheimer disease is not one single disorder. He and his team mapped and cloned a new family of genes called "presenilins" which, when mutated, are responsible not only for the aggressive early form of the disease, but also play an important role in all of its other forms.

Health care services

- A study by **Paul Hébert** of more than 800 patients admitted to intensive care at the Ottawa General Hospital demonstrated that it was possible to transfuse less blood and obtain similar or even better results. This study marked the first time that traditional blood transfusion practices were called into question. This research leads directly to a more efficient use of limited blood supplies.

- **David Naylor's** work, at the Institute for Clinical and Evaluative Sciences in Ontario, combines clinical practice, health services research and health policy to create a blueprint for a more effective and efficient health care system. His research with patients suffering from heart attacks or acute myocardial infarction (AMI) has included important assessments of the timeliness, use and cost-effectiveness of drugs used for treating heart attack victims.

Infectious diseases

- Viruses infect animals as well as people, which can have repercussions on human health. **Lorne Babiuk**, of the University of Saskatchewan, is studying viruses such as herpes in order to discover how they infect cells, how animal organisms react to them and what role genes play in the process. The results of this research should provide

a better understanding of this disease among humans.

- **Brett Finlay** of the University of British Columbia is applying techniques from several disciplines including microbiology, cell biology, and biochemistry, to understand the molecular mechanisms of bacterial pathogens such as Salmonella, E-coli and Listeria. His work could ultimately lead to the development of novel vaccines, diagnostics, and therapeutics that can be used in controlling infections caused by these organisms.

- Researchers at the University of Manitoba led by **Francis Allan Plummer** are studying individuals who appear to have immunity to HIV infection, a discovery which may advance research on HIV vaccines. They are now trying to find a genetic factor that would make some people resistant to the HIV virus.

- **Mark Wainberg**, director of the McGill AIDS Centre, is working to combat HIV resistance to AZT and other drugs as part of an effort to develop a comprehensive model of cost-effective care for treating HIV infection and disease. His lab at the Jewish General Hospital was the first to identify 3TC, one of the leading medications in the battle against AIDS, as an effective antiviral drug.

Public health

- One out of five Canadian families is a single-parent family, usually headed by a woman. **Marilyn Ford-Gilboe** and a team of researchers from the University of Western Ontario and the University of New Brunswick are studying the health of these families, particularly those broken up by violence or emotional abuse. The results of this study will make it possible to develop health programs and policies to support family health.

- **Katherine Gray-Donald, Noreen Willows** and **Johanne Morel** of McGill University are currently trying to discover the cause of anaemia in Cree infants. In the northern Quebec region east of James Bay, Cree babies are four times more likely to be anaemic than babies born to urban middle-class Canadian families and eight times more likely to have severe anaemia. This research should contribute to the treatment and prevention of such anaemia.

- **Christiane Poulin** of Dalhousie University's Department of Community Health and Epidemiology is conducting studies on the use of stimulants by adolescents. Given the growing number of adolescents who use illicit and prescription drugs, this research is particularly important.

Tissue engineering

- **François Auger** and colleague **Lucie Germain's** work focusses on tissue engineering using a patient's own cells to reconstruct a completely natural blood vessel containing no synthetic material. Because it uses a patient's own cells, there is no risk of rejection or need for long time use of drugs to overcome rejection. In the future, doctors may use this technique to graft vessels that would, through genetic engineering, produce anti-thrombotic secretion or insulin for a diabetic.

1998-99 in Review

In addition to funding over 2,500 grantees, 440 salary supported investigators and 1,500 research trainees in 1998-99, the Medical Research Council undertook a number of new partnerships and joint projects to build on the achievements of the past.

Partnership Challenge Fund
In the past fiscal year, 24 health charity and non-profit organizations partnered with the MRC to create an investment of up to $3.4 million dollars over two years. This will train about 80 young people in all fields of health research, in accordance with the objectives of the partner organizations. The Partnership Challenge Fund expresses, in a tangible way, the shared values of the MRC and non-government organizations which seek to improve the health of Canadians through new knowledge generated by research. MRC and its partners share the cost of personnel support on an equal basis.

Canadian Light Source
One of the new tools for very sophisticated analysis of the structure of molecules and materials is the synchrotron. The first such Canadian instrument is under development in Saskatoon. Funding for this development came from multiple sources, including $56 million from the Canadian Foundation for Innovation, $28.3 million from federal departments, $25 million from the Government of Saskatchewan, $2 million from SaskPower Inc. and $300 000 from the Universities of Alberta and Western Ontario. Because of the synchrotron's use in developing new drugs, designing new microchips for more powerful computers, manufacturing tiny biomedical implants and creating new materials, MRC will be contributing $5 million for its development.

Canadian Neurotrauma Research Program
Eight organizations, including the MRC, the NeuroScience Canada Foundation and the Rick Hansen Institute, have joined forces since February 1999, to contribute over $2 million, including $687,500 of MRC's support to finance neurotrauma research activities. The Canadian Neurotrauma Research Program will provide operating subsidies and postdoctoral research grants to strengthen capabilities and enhance training in this field. The primary goal of this partnership is to foster the exchange of ideas and innovations in research with a view to providing better treatment for brain and spinal cord injuries.

Research Chairs in Women's Health
The women's health sector received a boost on March 16, 1999, with the creation of Canada's first clinical research chairs in this field. This $4.4 million investment is part of a joint program involving MRC and Wyeth-Ayerst Canada Inc., which is a member of Canada's Research Based Pharmaceutical Companies (Rx&D). The company has agreed to contribute $2 million over a five-year period with the amount matched by participating universities. MRC's contribution is $400,000. The goals of the chairs will be to facilitate or lead multidisciplinary approaches to study the critical issues in women's health; to stimulate research and develop standards for clinical excellence in the study of women's health issues; and to champion women's health as a field of research.

Regional Partnerships Program
This year, eight health researchers at the University of Saskatchewan were the first to benefit from a new research grants program aimed at strengthening the health research community in Saskatchewan. The Saskatchewan Regional Partnerships Program is a joint initiative of MRC and the government of Saskatchewan. This grants program will provide $10 million for research over five years. Saskatchewan is committed to investing $1 million annually and MRC will match this contribution over and above its regular programs. The eight scientists will be conducting research on subjects ranging from public health to gene therapy and medical imaging. A similar partnership agreement has been concluded with the Government of Manitoba and discussions are underway with the Governments of New Brunswick, Prince Edward Island, Nova Scotia and Newfoundland.

A Modern Health Research Enterprise - the Canadian Institutes of Health Research

My December 1998 presentation to the government's Standing Committee on Health stressed the fact that the restoration of MRC's budget to 1994 levels—an increase of $40 million—had enabled us to support 225 additional projects, contribute to the training of over 600 researchers, create the Partnerships Challenge Fund with voluntary organizations in the health field, and increase the budget of the Regional Partnerships Program by $1 million. I also observed that 79% of Canadians feel that funding for health research should be increased in order to bring about improvements in population health and enable Canada to reap the economic benefits of sharing its discoveries with the rest of the world. Concerned about the Canadian level of research funding, I urged the Standing Committee on Health to consider a bold new initiative that would build on the excellence of Canadian research and maximize our growth potential both intellectually and economically: the Canadian Institutes of Health Research (CIHR).

My Report, last year, outlined the case for the development of a Canadian health research network whose benefits would extend not only to researchers, but also to individuals, communities, regions, provinces and,

ultimately, to the entire health-care system. In 1999, this dream became a reality, marking the culmination of a year of determined efforts on the part of a very broad coalition including the research community. Last fall, Health Research Awareness Week, sponsored by the Association of Canadian Teaching Hospitals (ACTH), promoted the importance of research to Canadians. Under the theme of *1% funding, 100% commitment*, this campaign made it possible for 82 institutions and 19 communities across Canada to participate. Their activities underscored the value of health research and called for an increase in public funding of such research. This 1% solution referred to a goal of federal funding equivalent to one per cent of Canadian health care costs, that is $800 million annually. Thanks to these efforts, 1999 has been an historic year in which ideas, paths and opportunities converged to facilitate the development of a large-scale collective endeavour.

The CIHR concept is based on six principles: innovation, integration and comprehensiveness; accountability and transparency; excellence and peer review; simplicity; effectiveness; and flexibility. For Canadian health research, this initiative represents a transformation of unprecedented scale and scope. CIHR is a logical development for MRC. It increases its commitment to the full spectrum of health research, its responsiveness to public health needs and its dedication to partnerships with other granting agencies, universities, research centres, as well as the voluntary and private sectors.

The CIHR concept will transform both the foundations and framework of health research in Canada. It is a bold initiative that entails some risk but promises much in the way of vision and possibility. Because of this, the concept won the support of the research community, the voluntary sectors, the provincial agencies, the teaching hospitals, the private sector and especially, Health Minister Allan Rock and his Cabinet colleagues. The CIHR initiative will transform Canadian research and allow new strengths to emerge: a research environment that offers hope and encouragement, funding that is internationally competitive, a framework that promotes cooperation and partnership, structures that are transparent and provide greater accountability, new intellectual capital that will enable Canada to improve its position on world markets, and a vigorous life sciences sector that will provide high-quality jobs to thousands of Canadians, as well as optimal levels of health care.

Research requires a stable base, hence it cannot be funded episodically. It is a long term investment. We must ensure sustained support to develop new ideas, renew our facilities and, above all, invest in people. Investment in health research will allow us to achieve these goals, as well as our vision of improving the well-being of Canadians. In an era of abundant and complex knowledge, our objective is clear. As Health Minister Rock stated, our objective must be to develop a system in the true sense of the word, which will provide Canadians with access to health information and services "at the right time, in the right place."

And Tomorrow?

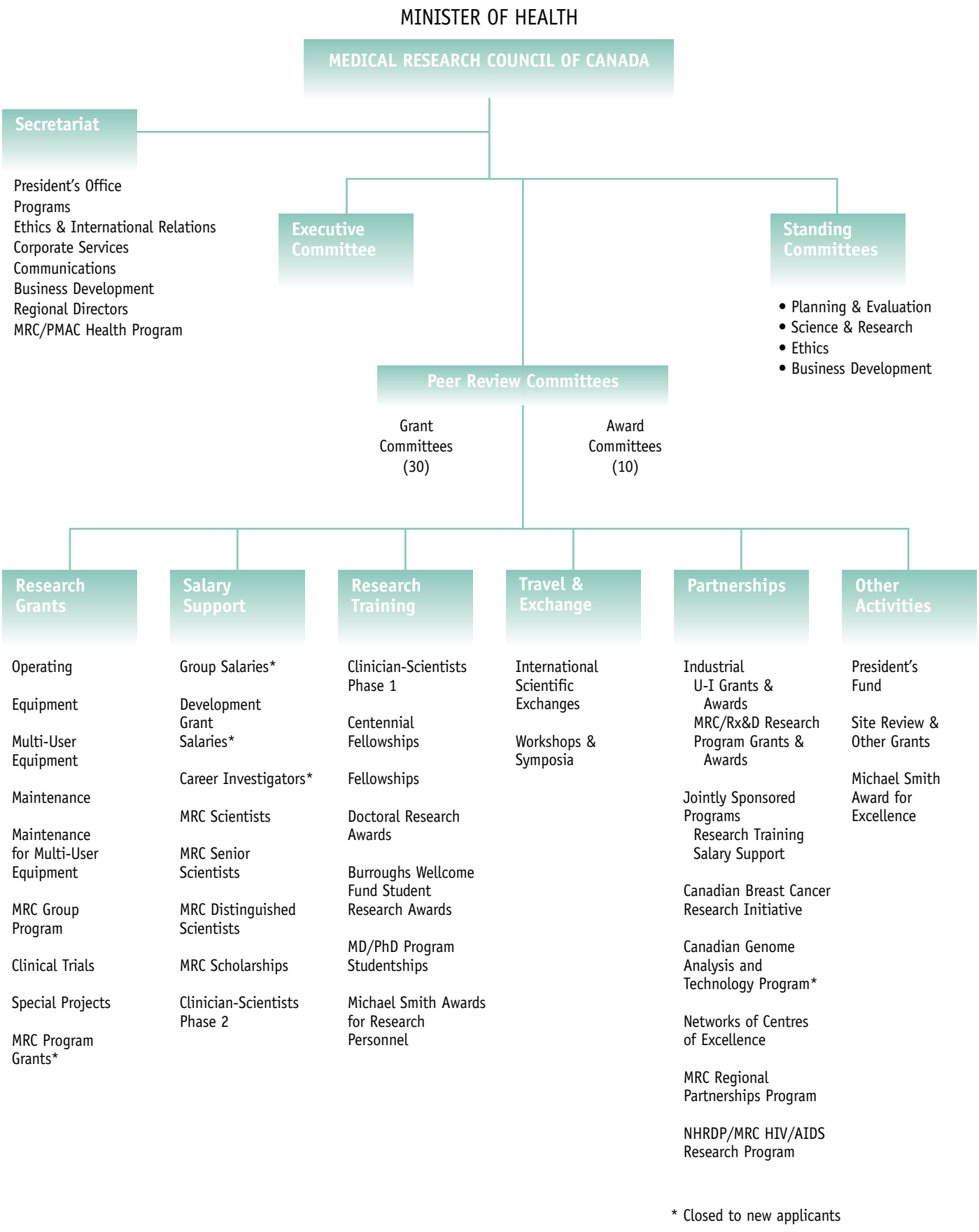
And Tomorrow?

CIHR will enable us to take a more integrated approach to research and to maximize the benefits of new research resources. It will offer researchers the best tools available to meet the health challenges of the coming century. This will require an enormous amount of work; in comparison, the collective efforts which have gone into establishing CIHR will seem like a mere prelude.

We in the Canadian health-research community have a duty to constructively shape the future. Our role will be that of agents of development for the CIHR and world ambassadors for the institutes we will help to build.

Building has, in fact, been the motto of the Medical Research Council of Canada since its inception. The Council has never strayed from this path, which now leads it toward integration within a new organizational framework. I hope that MRC will be remembered as the birthplace of health research in Canada as it is reborn as the Canadian Institutes of Health Research. The future begins today: Canadian researchers will one day recall that it all began in 1999, at the turn of the century and the dawn of a new millennium ...

MRC Organization and Program Chart



* Closed to new applicants

Membership of Council, 1998-99

MRC Council Members - *Front row*, l. to r., Noralou Roos, Denise Alcock, Henry Friesen, Kevin M. W. Keough, Mona Nemer - *Second row*, Raelene Rathbone, Yves Morin, Khaled Hashem, Judith Hall, Heather Munroe-Blum, Philip Seeman, Joel Weiner - *Back row,* Jacques Simard, David Goltzman, James Dosman, Gerald S. Marks, Bob McMurtry, Philippe Crine, Denis R. Roy - Hélène Desmarais, absent for photograph

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Heather Munro-Blum,
Ph.D,
Vice-President,
Research and International Relations,
University of Toronto

Mona Nemer, (UNTIL JULY 1999)
Ph.D., B.Sc.,
Professeur, Département de pharmacologie,
Université de Montréal,
Directrice du Laboratoire de développement et de
différenciation cardiaques,
Institut de recherches cliniques de Montréal

Raelene Rathbone,
M.D., Ph.D., M.B., B.S.,
Associate Vice-President, Faculty of Health Sciences,
McMaster University

Noralou Roos,
Ph.D.,
Professor, Department of Community Health Sciences,
University of Manitoba,
Director of Manitoba Centre for Health Policy and
Evaluation

Denis Roy,
M.D., M.B.A., F.R.C.P.,
Directeur,
Services professionnels et hospitaliers
Hôpital Royal Victoria de Montréal

Philip Seeman,
M.D., Ph.D., M.Sc., B.Sc.,
Professor, Departments of Pharmacology & Psychiatry,
University of Toronto

Jacques Simard,
Ph.D.,
Directeur,
Laboratoire des cancers héréditaires
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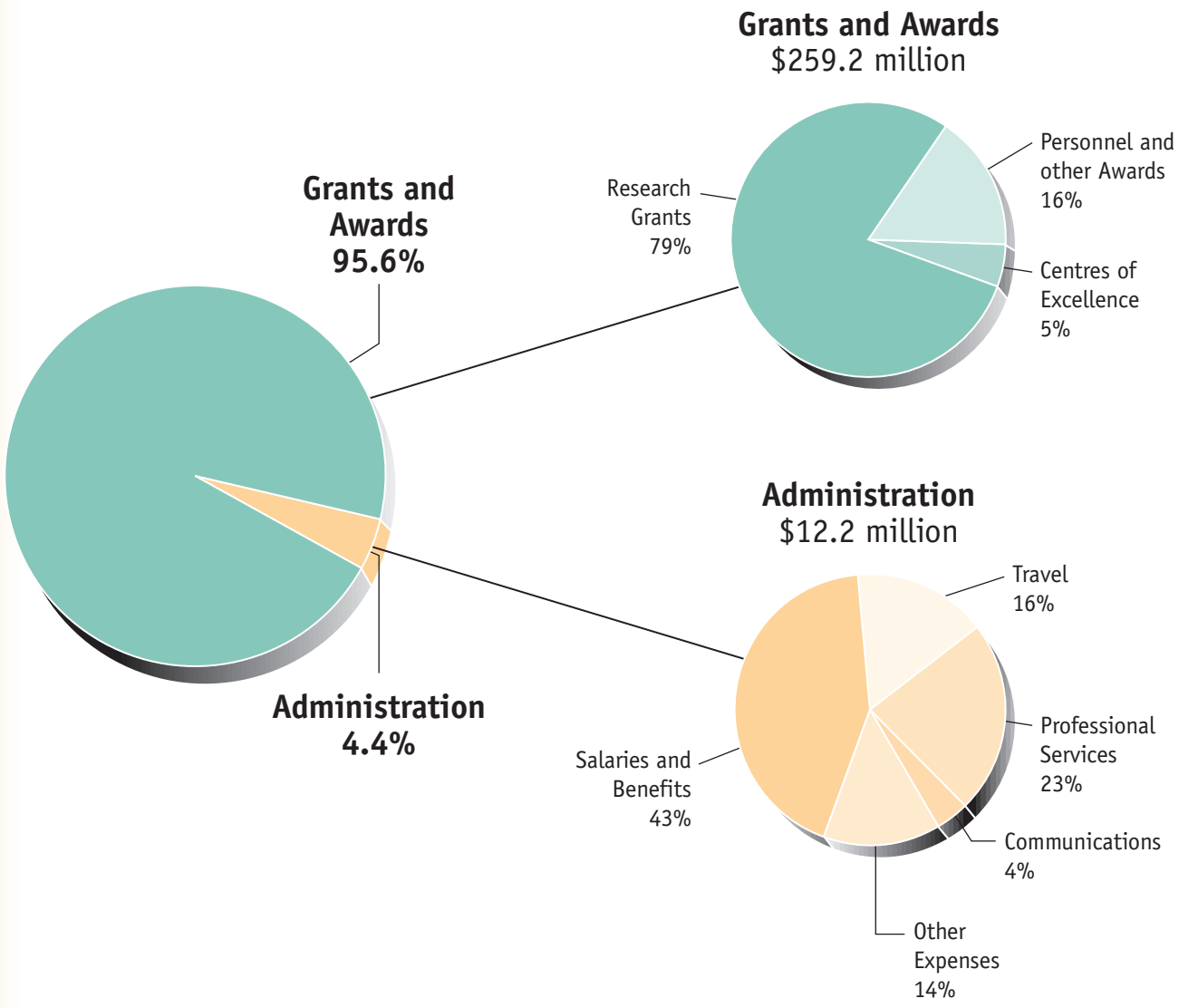
Statistical and Financial Data

MRC Expenditures, 1998-99

Total Expenditures
1998-99
$271.4 million



EXPENDITURES BY UNIVERSITY AND MRC PROGRAM 1998-99

(in thousands of dollars)

	GRANTS				MULTI-DISCIPLINARY			SALARY SUPPORT							
	Operating Grants[1]	Special Projects	MRC Genome	University-Industry Grants[2]	MRC Groups	Program Grants	Development Grants[3]	MRC Groups	Development Grants	Career Investigators	Distinguished Scientists	Senior Scientists	MRC Scientists[3]	Scholarships[3]	Clinician Scientists Phase 2
BRITISH COLUMBIA															
British Columbia	12,723	–	59	331	262	394	–	–	61	89	50	50	427	785	184
Simon Fraser	299	–	–	–	–	–	–	–	–	–	–	–	62	–	–
U. College of the Cariboo	65	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Victoria	666	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ALBERTA															
Alberta	10,839	–	19	619	1,180	468	–	–	44	–	100	100	160	751	–
Alberta Cancer Board	136	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Calgary	8,296	–	–	171	1,103	–	–	–	84	–	50	150	207	515	63
Lethbridge	144	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SASKATCHEWAN															
Saskatchewan	1,823	–	–	–	–	–	–	–	107	–	117	–	165	43	–
Health Services Util. & Res. Comm.	42	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Regina	62	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MANITOBA															
Manitoba	4,616	–	–	60	1,235	–	507	294	83	89	–	138	261	268	58
ONTARIO															
Carleton	174	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Guelph	837	–	–	–	–	–	–	–	–	–	–	–	–	59	–
Laurentian	54	–	–	–	–	–	–	–	–	–	–	–	–	–	–
McMaster	7,824	100	–	1,101	–	–	–	–	–	–	–	50	287	181	64
Northeastern Ont. Reg. Cancer Ctre.	142	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ottawa	5,390	–	–	470	662	–	–	–	155	–	50	38	248	581	–
Queen's	4,762	–	50	51	394	–	–	–	44	–	–	–	69	215	–
Trent	33	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Toronto	34,505	230	100	1,010	5,702	208	–	561	75	–	288	338	1,192	1,682	405
Waterloo	154	–	–	–	–	–	–	–	–	–	–	–	–	56	–
Western Ontario	8,131	–	37	54	2,045	–	–	411	243	22	33	50	104	605	–
York	493	–	25	–	–	–	–	–	–	–	–	–	–	59	–
QUEBEC															
Concordia	661	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Laval	6,958	–	–	180	2,162	–	–	–	71	–	50	–	262	658	–
McGill	24,783	70	24	750	2,912	–	–	47	57	183	200	238	919	1,432	240
Montréal	15,225	307	20	398	2,959	319	–	311	305	94	50	–	459	490	102
Univ. du Québec à Montréal	913	–	–	90	–	–	–	–	–	–	–	–	–	56	–
Univ. du Québec à Rimouski	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Univ. du Québec à Trois-Rivières	68	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Sherbrooke	3,296	–	–	–	1,474	–	–	–	–	22	50	–	16	202	74
NEW BRUNSWICK															
New Brunswick	58	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PRINCE EDWARD ISLAND															
Prince Edward Island	56	–	–	–	–	–	–	–	–	–	–	–	–	53	–
NOVA SCOTIA															
Dalhousie	4,212	–	–	20	–	421	176	–	182	–	38	–	184	339	–
NEWFOUNDLAND															
Memorial	1,115	–	–	–	–	–	201	–	118	–	–	–	–	–	–
OTHERS	4,000	1,618	–	34	–	–	–	–	–	–	–	–	–	–	–
OUTSIDE CANADA	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
GRAND TOTAL*	**163,555**	**2,325**	**334**	**5,338**	**22,090**	**1,810**	**885**	**1,625**	**1,628**	**498**	**1,075**	**1,150**	**5,023**	**9,028**	**1,190**

1. Includes Maintenance ($3,325); Equipment ($2,321); Aids ($896); Health Services Research ($2,000); Breast Cancer ($2,000).
2. Includes MRC/PMAC Health Program ($5,461).
3. Includes Regional Partnerships Program ($1,515).
4. Includes Dental Fellowships ($50); Centennial Fellowships ($741).

	RESEARCH TRAINING									
	Clinician Scientists Phase 1	Fellowships[3,4,7]	Studentships[7]	Burroughs Wellcome Student Research Fund	U-I Training Awards[2]	TRAVEL & EXCHANGE[5]	OTHER ACTIVITIES[6]	TOTAL CORE PROGRAMS	NETWORKS OF CENTRES OF EXCELLENCE	TOTAL ALL PROGRAMS
BRITISH COLUMBIA										
British Columbia	–	417	671	78	227	15	100	**16,923**	4,500	**21,423**
Simon Fraser	–	–	56	–	–	5	2	**425**	–	**425**
U. College of the Cariboo	–	–	–	–	–	–	–	**65**	–	**65**
Victoria	–	–	39	–	–	–	–	**705**	–	**705**
ALBERTA										
Alberta	–	494	575	23	169	13	107	**15,660**	2,250	**17,910**
Alberta Cancer Board	–	–	–	–	–	–	–	**136**	–	**136**
Calgary	48	194	471	9	186	5	100	**11,651**	1,900	**13,551**
Lethbridge	–	–	–	–	–	–	–	**144**	–	**144**
SASKATCHEWAN										
Saskatchewan	–	60	56	16	21	5	100	**2,514**	–	**2,514**
Health Services Util. & Res. Comm.	–	–	–	–	–	–	–	**42**	–	**42**
Regina	–	–	–	–	–	–	–	**62**	–	**62**
MANITOBA										
Manitoba	–	88	285	23	31	–	121	**8,156**	–	**8,156**
ONTARIO										
Carleton	–	–	–	–	–	–	–	**174**	–	**174**
Guelph	–	120	16	–	–	–	6	**1,038**	–	**1,038**
Laurentian	–	–	–	–	–	–	–	**54**	–	**54**
McMaster	40	210	242	53	116	2	105	**10,374**	1,800	**12,174**
Northeastern Ont. Reg. Cancer Ctre.	–	–	–	–	–	–	–	**142**	–	**142**
Ottawa	32	213	135	13	85	–	125	**8,195**	–	**8,195**
Queen's	51	83	316	45	51	–	100	**6,229**	–	**6,229**
Trent	–	–	–	–	–	–	–	**33**	–	**33**
Toronto	194	2,144	1,999	88	296	11	104	**51,132**	3,205	**54,337**
Waterloo	–	–	–	–	–	4	–	**213**	–	**213**
Western Ontario	–	100	528	21	52	–	102	**12,539**	–	**12,539**
York	–	20	56	–	–	2	–	**654**	–	**654**
QUEBEC										
Concordia	–	–	84	–	3	–	–	**748**	–	**748**
Laval	–	195	578	23	110	15	105	**11,367**	–	**11,367**
McGill	74	1,029	1,852	34	109	16	140	**35,109**	–	**35,109**
Montréal	–	526	755	37	184	14	107	**22,662**	–	**22,662**
Univ. du Québec à Montréal	–	51	28	–	–	6	–	**1,144**	–	**1,144**
Univ. du Québec à Rimouski	–	12	–	–	–	1	–	**13**	–	**13**
Univ. du Québec à Trois-Rivières	–	–	–	–	–	–	–	**68**	–	**68**
Sherbrooke	–	–	118	9	12	10	130	**5,414**	–	**5,414**
NEW BRUNSWICK										
New Brunswick	–	–	–	–	–	–	–	**58**	–	**58**
PRINCE EDWARD ISLAND										
Prince Edward Island	–	–	–	–	–	–	–	**109**	–	**109**
NOVA SCOTIA										
Dalhousie	–	24	268	28	36	–	100	**6,028**	–	**6,028**
NEWFOUNDLAND										
Memorial	–	49	47	32	25	–	100	**1,688**	–	**1,688**
OTHERS	–	1,186	488	–	211	164	1,546	**9,247**	–	**9,247**
OUTSIDE CANADA	571	4,015	2	–	30	–	–	**4,617**	–	**4,617**
GRAND TOTAL*	**1,008**	**11,230**	**9,664**	**533**	**1,955**	**287**	**3,301**	**245,533**	**13,655**	**259,187**

5. Includes Visiting Scientists ($150); Symposia ($137).
6. Includes President's Fund ($524); General Research Grants ($1,600).
Canadian Council on Animal Care ($482); Other Grants ($695).
7. Includes Doctoral Research Awards ($1,442); Partnership Challenge Fund ($1,693).

* Some additions may not agree due to rounding.

Number of Grants and Awards

1997-98 and 1998-99

	1997-98 Grants and Awards		1998-99 Number of Grants and Awards			Total	
	Number	Amount $(000)	Continuing	Renewals	New	Number	Amount $(000)
GRANTS							
Operating	2,185	131,649	1,357	418	405	2,180	153,909
Maintenance	57	3,694	41	8	11	60	3,325
Equipment	32	3,388	2	–	16	18	2,321
Health Services Research	1	2,000	1	–	–	1	2,000
Regional Partnerships	8	134	8	22	3	33	854
Breast Cancer Research Initiative	1	1,962	1	–	–	1	2,000
Special Projects	10	2,251	8	–	–	8	2,325
MRC Genome	3	390	–	–	11	11	334
University-Industry Grants	135	5,340	91	2	62	155	5,338
General Research Grants	–	–	–	–	16	16	1,600
	2,432	**150,808**	**1,509**	**450**	**524**	**2,483**	**174,006**
MULTI-DISCIPLINARY							
MRC Groups	34	18,856	31	2	6	39	22,090
Program Grants	13	3,787	5	–	–	5	1,810
Development Grants	11	394	1	–	–	1	31
	58	**23,036**	**37**	**2**	**6**	**45**	**23,931**
SALARY SUPPORT							
MRC Groups	29	1,847	25	–	–	25	1,625
Development Grants	43	2,037	32	3	–	35	1,628
Career Investigators	9	673	7	–	–	7	498
Distinguished Scientists	17	762	17	–	3	20	958
Senior Scientists	20	863	19	–	5	24	1,150
MRC Scientists	75	4,256	60	–	21	81	4,502
Scholarships	168	7,997	156	–	38	194	9,021
Clinician Scientists Phase 2	14	1,060	14	1	3	18	1,190
Regional Partnerships	–	–	1	–	4	5	643
U-I Salary Support Programs	54	1,007	39	–	45	84	1,019
	429	**20,502**	**370**	**4**	**119**	**493**	**22,234**
RESEARCH TRAINING							
Clinician Scientists Phase 1	29	1,119	22	3	3	28	1,008
Centennial Fellowships	25	787	10	–	11	21	741
Fellowships	391	8,731	239	–	145	384	9,218
Dental Fellowships	3	85	2	–	–	2	50
Studentships	478	5,936	407	–	197	604	9,176
Burroughs Wellcome Student Research Fund	303	404	–	–	305	305	533
Regional Partnerships	–	–	1	–	1	2	18
Partnerships Challenge Fund	–	–	–	–	59	59	1,693
U-I Training Awards	121	654	43	–	41	84	936
	1,350	**17,717**	**724**	**3**	**762**	**1,489**	**23,373**
TRAVEL AND EXCHANGE							
Visiting Scientists	44	163	–	–	34	34	150
Symposia & Workshops	25	119	–	–	26	26	137
	69	**282**	**0**	**0**	**60**	**60**	**287**
OTHER ACTIVITIES							
President's Fund	31	550	1	–	36	37	524
Grants to Other Organizations	6	1,677	5	–	–	5	1,177
	37	**2,227**	**6**	**0**	**36**	**42**	**1,701**
TOTAL CORE PROGRAMS	**4,375**	**214,573**	**2,646**	**459**	**1,507**	**4,612**	**245,532**
Networks of Centres of Excellence	6	13,518	4	–	2	6	13,655
	6	**13,518**	**4**	**0**	**2**	**6**	**13,655**
TOTAL ALL PROGRAMS*	**4,381**	**228,091**	**2,650**	**459**	**1,509**	**4,618**	**259,187**
PERCENTAGE OF 1998-99 TOTAL			**57.4%**	**9.9%**	**32.7%**	**100.0%**	

* Some additions may not agree due to rounding

Expenditures by MRC Program, 1996-97 to 1998-99 and Category of Support

(in thousands of dollars)

	EXPENDITURES			1998-99 CATEGORY OF SUPPORT				
	1996-97	1997-98	1998-99	Operating	Equipment	Salary Benefits & Stipends	Research Allowances	Travel, Honoraria & Other
GRANTS								
Operating	133,136	131,649	153,909	151,189	2,720	–	–	–
Maintenance	2,494	3,694	3,325	3,325	–	–	–	–
Equipment	929	3,388	2,321	–	2,321	–	–	–
Health Services Research	2,000	2,000	2,000	2,000	–	–	–	–
Regional Partnerships	–	134	854	854	–	–	–	–
Breast Cancer Research Initiative	–	1,962	2,000	2,000	–	–	–	–
Special Projects	2,468	2,251	2,325	2,325	–	–	–	–
MRC Genome	3,012	390	334	246	–	–	–	88
University-Industry Grants / PMAC Grants	5,168	5,340	5,338	5,323	–	–	–	15
General Research Grants	–	–	1,600	–	–	–	–	1,600
	149,207	**150,809**	**174,006**	**167,262**	**5,041**	–	–	**1,703**
MULTI-DISCIPLINARY								
MRC Groups	16,001	18,856	22,090	21,316	774	–	–	–
Program Grants	7,006	3,787	1,810	1,810	–	–	–	–
Development Grants	987	394	31	31	–	–	–	–
	23,994	**23,036**	**23,931**	**23,157**	**774**	–	–	–
SALARY SUPPORT								
MRC Groups	2,724	1,847	1,625	–	–	1,625	–	–
Development Grants	2,574	2,037	1,628	–	–	1,628	–	–
Career Investigators	882	673	498	–	–	498	–	–
Distinguished Scientists	400	762	958	–	–	958	–	–
Senior Scientists	518	863	1,150	–	–	1,150	–	–
MRC Scientists	3,948	4,256	4,502	–	–	4,502	–	–
Scholarships	8,746	7,997	9,021	–	–	8,876	145	–
Clinician Scientists Phase 2	1,027	1,060	1,190	–	–	870	320	–
Regional Partnerships	–	–	643	–	–	643	–	–
U-I Salary Support Programs	971	1,007	1,019	–	–	1,019	–	–
	21,790	**20,502**	**22,234**	–	–	**21,769**	**465**	–
RESEARCH TRAINING								
Clinician-Scientists Phase 1	1,162	1,119	1,008	–	–	936	72	–
Centennial Fellowships	676	787	741	–	–	672	69	–
Fellowships	10,065	8,731	9,218	–	–	8,772	446	–
Dental Fellowships	164	85	50	–	–	49	1	–
Studentships	5,221	5,936	9,176	–	–	8,920	256	–
Burroughs Wellcome Student Research Fund	442	404	533	–	–	533	–	–
Regional Partnerships	–	–	18	–	–	18	–	–
Partnerships Challenge Fund	–	–	1,693	–	–	1,621	72	–
U-I Training Awards	557	654	936	–	–	851	85	–
	18,287	**17,717**	**23,373**	–	–	**22,372**	**1,002**	–
TRAVEL AND EXCHANGE								
Visiting Scientists	175	163	150	–	–	124	–	26
Travel Grants, Symposia & Workshops	102	119	137	–	–	–	–	137
	277	**282**	**287**	–	–	**124**	–	**163**
OTHER ACTIVITIES								
President's Fund	566	550	524	–	–	–	–	524
Grants to Other Organizations	4,436	1,677	1,177	–	–	–	–	1,177
	5,002	**2,227**	**1,701**	**–**	**–**	**–**	**–**	**1,701**
TOTAL CORE PROGRAMS	**218,558**	**214,573**	**245,532**	**190,419**	**5,815**	**44,265**	**1,467**	**3,567**
Genome Programs	494	–	–	–	–	–	–	–
Networks of Centres of Excellence	14,704	13,518	13,655	13,655	–	–	–	–
	15,198	**13,518**	**13,655**	**13,655**	–	–	–	–
TOTAL ALL PROGRAMS*	**233,756**	**228,091**	**259,187**	**204,074**	**5,815**	**44,265**	**1,467**	**3,567**
PERCENTAGE OF 1998-99 TOTAL				**78.7%**	**2.2%**	**17.1%**	**0.6%**	**1.4%**

*Some additions may not agree due to rounding.

Distribution of MRC Expenditures by Province

1993-94 to 1998-99

	1993-94		1994-95		1995-96		1996-97		1997-98		1998-99	
Province	**$ (000)**	**%**	**$ (000)**	**%**	**$ (000)**	**%**	**$ (000)**	**%**	**$ (000)**	**%**	**$ (000)**	**%**
British Columbia	26,197	10.4%	30,017	11.7%	24,150	9.9%	19,915	8.5%	19,292	8.5%	22,618	7.4%
Alberta	26,123	10.4%	26,533	10.3%	28,255	11.6%	28,575	12.2%	28,225	12.4%	31,741	12.0%
Saskatchewan	4,141	1.6%	3,337	1.3%	3,050	1.3%	2,418	1.0%	2,315	1.0%	2,618	1.1%
Manitoba	9,948	4.0%	10,178	4.0%	9,123	3.8%	8,187	3.5%	7,511	3.3%	8,156	3.3%
Ontario	86,970	34.6%	85,366	33.1%	83,761	34.4%	82,125	35.1%	80,821	35.4%	95,782	39.0%
Quebec	79,612	31.7%	83,619	32.5%	77,699	32.0%	72,869	31.2%	71,818	31.5%	76,525	31.2%
New Brunswick	38	<0.1%	22	<0.1%	72	<0.1%	97	<0.1%	91	<0.1%	58	0.0%
Prince Edward Island	53	<0.1%	57	<0.1%	54	<0.1%	61	<0.1%	62	<0.1%	109	0.0%
Nova Scotia	5,751	2.3%	5,641	2.2%	5,120	2.1%	4,953	2.1%	5,383	2.4%	6,028	2.5%
Newfoundland	1,956	0.8%	1,614	0.6%	1,535	0.6%	1,584	0.7%	1,342	0.6%	1,688	0.7%
Others	2,060	0.8%	3,089	1.2%	3,029	1.2%	7,270	3.1%	6,505	2.9%	9,247	3.8%
Outside Canada	8,439	3.4%	8,158	3.2%	7,338	3.0%	5,702	2.4%	4,722	2.1%	4,617	1.9%
Total*	**251,288**	**100.0%**	**257,634**	**100.0%**	**243,187**	**100.0%**	**233,755**	**100.0%**	**228,091**	**100.0%**	**259,187**	**100.0%**

*Some additions may not agree due to rounding

Operating Grants by Area of Research

	Research Grants	Program Grants	Groups Grants	Funding $000	Percentage of Total
Bacteriology	42	–	1	3,336	1.8
Biochemistry	167	2	2	15,189	8.4
Blood	37	–	–	2,655	1.5
Cancer	143	–	1	10,903	6.0
Cardiovascular	174	–	10	14,951	8.2
Cell Biology	176	–	2	13,759	7.6
Dental Science	32	–	1	2,985	1.6
Drug Research	85	–	–	5,194	2.9
Endocrinology	87	–	3	8,129	4.5
Gastrointestinal and Liver	52	–	1	3,932	2.2
Genetics	129	–	1	11,901	6.6
Health Research	9	–	–	407	0.2
Health Services Research	31	–	–	1,817	1.0
Hearing	8	–	–	468	0.3
Imaging and Nuclear Medicine	36	–	1	2,676	1.5
Immunology and Transplantation	94	–	2	8,704	4.8
Metabolism (incl. Diabetes)	67	–	2	5,462	3.0
Molecular Biology	140	–	–	11,155	6.1
Musculo-Skeletal	64	–	–	4,052	2.2
Nephrology	24	–	–	1,719	0.9
Neurosciences	330	–	11	29,553	16.3
Nursing	4	–	–	259	0.1
Nutrition	24	–	–	1,514	0.8
Population Health	21	–	–	2,280	1.3
Psychosocial/Health Behavioral Res.	42	–	–	2,226	1.2
Reproduction (incl. Pregnancy)	53	–	2	5,583	3.1
Respiration	87	–	1	6,084	3.4
Virology	27	–	1	2,683	1.5
Vision	29	–	1	1,978	1.1
Total	**2214**	**2**	**43**	**181,554**	**100***

*Some additions may not agree due to rounding

Figures as at September 1999

AUDITOR GENERAL OF CANADA VÉRIFICATEUR GÉNÉRAL DU CANADA

AUDITOR'S REPORT

To the Medical Research Council
and the Minister of Health

I have audited the statement of operations of the Medical Research Council for the year ended March 31, 1999. This financial statement is the responsibility of the Council's management. My responsibility is to express an opinion on this financial statement based on my audit.

I conducted my audit in accordance with generally accepted auditing standards. Those standards require that I plan and perform an audit to obtain reasonable assurance whether the financial statement is free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statement. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In my opinion, this financial statement presents fairly, in all material respects, the results of operations of the Council for the year ended March 31, 1999 in accordance with the accounting policies set out in Note 3 to the financial statement.

Richard Flageole, FCA
Assistant Auditor General
for the Auditor General of Canada

Ottawa, Canada
June 30, 1999

MANAGEMENT REPORT

We have prepared the accompanying financial statement of the Medical Research Council in accordance with the reporting requirements and standards of the Receiver General for Canada. This financial statement was prepared in accordance with the significant accounting policies set out in Note 3 of the statement, on a basis consistent with that of the preceding year. Some previous year figures have been reclassified to conform to the current year's presentation.

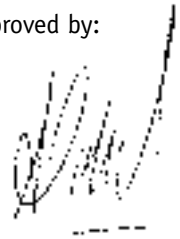
Responsibility for the integrity and objectivity of data in this financial statement rests with the management of the Council. The information included in the financial statement is based on management's best estimates and judgements with due consideration to materiality. To fulfill these accounting and reporting responsibilities, the Council maintains a set of accounts which provides a centralized record of the Council's financial transactions. Financial information contained in the ministerial statements and elsewhere in the *Public Accounts of Canada* is consistent with this financial statement, unless indicated otherwise.

The Council's Corporate Services Directorate develops and disseminates financial management and accounting policies, and issues specific directives which maintain standards of accounting and financial management. The Council maintains systems of financial management and internal control which give due consideration to costs, benefits and risks. They are designed to provide reasonable assurance that transactions are properly authorized by Parliament and are executed in accordance with prescribed regulations, and are properly recorded so as to maintain accountability of Government funds and safeguard the Council's assets. The Council also seeks to assure the objectivity and integrity of data in its financial statement by the careful selection, training and development of qualified staff, by organizational arrangements that provide appropriate divisions of responsibility, and by communication programs aimed at ensuring that its regulations, policies, standards and managerial authorities are understood throughout the organization.

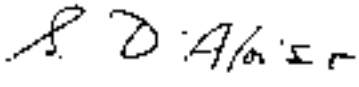
Management presents this financial statement to the Auditor General of Canada, who audits it and provides an independent opinion which has been appended to this financial statement.

The accounting system and financial statement of the Council have evolved over the years to meet the changes in the structure of the grants and scholarships programs and to give improved reporting and control of expenditures relating to those programs.

Approved by:



Alain Gélinas
Manager, Finance & Administration



Guy D'Aloisio
Director, Corporate Services

June 30, 1999

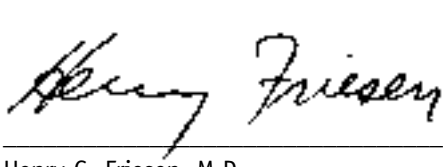
STATEMENT OF OPERATIONS FOR THE YEAR ENDED MARCH 31, 1999

(in thousands of dollars)

	1999	1998
Expenditure		
Grants and Scholarships (See Schedule)		
Grants (Note 4)	174,006	151,569
Multi-Disciplinary (Note 4)	23,931	22,776
Salary Support	22,234	20,502
Research Training	23,373	17,717
Travel and Exchange	287	282
Other Activities (Note 4)	1,701	1,727
Networks of Centres of Excellence	13,655	13,518
	259,187	**228,091**
Operations		
Salaries and employee benefits	4,000	3,314
Employee termination benefits	30	–
Professional and special services	2,054	1,334
Travel (Note 6)	1,667	1,441
Accommodation	322	295
Communications	315	242
Publications	313	264
Materials and supplies	312	162
Furniture and equipment	281	104
Equipment repair and maintenance	116	85
	9,410	**7,241**
Administration		
Salaries and employee benefits	1,522	1,357
Employee termination benefits	–	12
Professional and special services	786	475
Travel (Note 6)	332	182
Publications	275	222
Accommodation	121	114
Communications	120	99
Materials and supplies	119	66
Furniture and equipment	107	42
Equipment repair and maintenance	44	35
Interest	3	–
	3,429	**2,604**
	272,026	**237,936**
Non-tax revenue		
Refunds of previous years' expenditure (Note 4)	550	894
Adjustment of prior years' PAYE	107	80
Net cost of operations (Note 5)	**271,369**	**236,962**

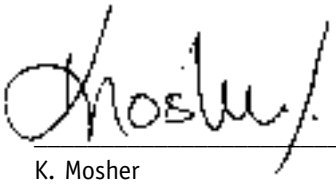
The accompanying notes and schedule are an integral part of this statement.

Approved by the Council:



Henry G. Friesen, M.D.
President

Approved by Management:



K. Mosher
Executive Director

NOTES TO THE STATEMENT OF OPERATIONS
MARCH 31, 1999

1. Authority and purpose

The Medical Research Council was established in 1969 by the Medical Research Council Act and is a departmental corporation named in Schedule II to the Financial Administration Act. The objective of the Council is to help attain the quality and scale of research in the health sciences essential to the maintenance and improvement of health services. The Council's operating and grants expenditures are funded by a budgetary lapsing authority. Employee benefits are authorized by a statutory authority.

2. Canadian Institutes of Health Research

In the February 1999 Federal Budget speech the Minister of Finance announced the creation of Canadian Institutes of Health Research which will provide an integrated framework for Canadian health science funders, researchers and users of research results. It is expected the law enacting the new Canadian Institutes of Health Research will be passed in the year 2000, at which time MRC will cease to exist as a separate entity and will be amalgamated with the new organization.

3. Significant accounting policies

The statement of operations has been prepared in accordance with the reporting requirements and standards established by the Receiver General for Canada for departmental corporations. The most significant accounting policies are as follows:

(a) Expenditure recognition

Grants and scholarships are charged to expenditure when disbursed. All operating expenditure is recorded on the accrual basis, with the exception of termination benefits and vacation pay which are recorded on the cash basis.

(b) Revenue recognition

Revenue is recorded on the cash basis.

(c) Capital purchases

Acquisitions of capital assets are charged to operating expenditure in the year of purchase.

(d) Services provided without charge from Government departments

Estimates of amounts for services provided without charge from Government departments are included in expenditure.

(e) Refunds of previous years' expenditures

Refunds of previous years' expenditures are recorded as revenues when received and are not deducted from expenditures.

(f) Contributions to the Public Service Superannuation Plan

Employees participate in the Public Service Superannuation Plan administered by the Government of Canada. The employees and the Council contribute equally to the cost of the Plan. Contributions by the Council are charged to expenditure on a current basis. The Council is not required under present legislation to make contributions with respect to actuarial deficiencies of the Public Service Superannuation Plan.

4. Changes in financial statement presentation

Some previous year's figures have been reclassified to conform with the current year's presentation. This was done to provide more details on the programs.

a) In the *Statement of Operations* the reclassified figures are as follows:

(in thousands of dollars)

	Revised Classification 1998	Former Classification 1998
Grants and Scholarships		
Grants	151,569	150,675
Multi-disciplinary	22,776	23,170
Other Activities	1,727	2,227
Non-tax revenue		
Refunds of previous years' expenditure	894	892
Sale of crown assets surplus	–	2

b) In the *Schedule of Grants and Scholarships* the re-classified figures are:

Grants		
Operating Grants	127,760	131,649
Clinical Trials	4,389	–
Regional Partnerships	394	–
Multi-Disciplinary		
Development Grants	134	528
Salary Support		
MRC Scientists	4,241	4,256
Regional Partnerships	15	–
Research Training		
Fellowships	8,726	8,732
Regional Partnerships Training Awards	6	–
Other Activities		
Other Grants	1,177	1,677

5. Parliamentary appropriations

(in thousands of dollars)

	1999	1998
Department of Health		
Vote 20 — Grants	259,267	228,120
lapsed	80	29
	259,187	**228,091**
Vote 15 — Operating expenditure	11,381	9,048
lapsed	97	430
	11,284	**8,618**
Statutory contributions to employee benefit plans	894	616
Spending of proceeds from the disposal of surplus Crown assets	2	–
Total use of appropriations	**271,367**	**237,325**
Add:services provided without charge by government department	659	611
Less: non-tax revenue	657	974
Net cost of operations	**271,369**	**236,962**

6. Travel

Expenditure for travel charged to operations is related to the peer review process and was incurred by the members of 30 grant committees, 10 award committees and the staff of the Council to meet, assess and rate grant and award applications. In addition, travel expenditure incurred by the Council, its executive and standing committees and other non-staff advisory personnel is also charged to operations.

Expenditure for travel charged to administration is for the general support of the Council's administrative activities and includes meetings of ad hoc advisory groups established to study specific issues for the Council. Details are as follows:

(in thousands of dollars)

	1999	1998
Operations:		
Grant Committees	782	769
Staff	197	185
Council/Executive	139	53
Canadian Institutes of Health Research	127	–
Award Committees	118	107
Standing Committees	117	120
Regional Retreats	80	91
Site Reviews	68	72
Advisory Groups	39	44
	1,667	**1,441**
Administration:		
Advisory Groups	206	83
Staff	126	99
	332	**182**

All members of the Council and the committees listed above serve without remuneration. Only their travel expenses are reimbursed by the Council.

7. Trust funds

As provided for in Section 4(3) of the Medical Research Council Act, the Council administers a number of trust funds separately from the activities funded through parliamentary appropriations. The purpose and accounting for these funds is described below. The balance of these funds is represented by deposit with the Receiver General for Canada.

(a) In 1974, the Council received $75,000 from an anonymous donor to establish a fund. The interest received is used for the payment of grants for research in the fields of dyskinesia and torticollis. Other donations received in prior years not earmarked for specific projects have also been credited to this fund.

(b) A fund was established to record donations and contributions received from organizations and individuals for biomedical research. When the Council receives such monies, they are placed in trust and disbursed in accordance with agreements between the contributor and the Council.

The transactions relating to these two funds are as follows:

(in thousands of dollars)

	Dyskinesia & Torticollis		Donations for Biomedical Research	
	1999	**1998**	**1999**	**1998**
Balance:				
Beginning of year	78	84	1,643	4,288
Add:				
Donations received	–	–	1,855	2,723
Interest received	3	3	76	112
Less:				
Grants paid	–	9	2,232	5,480
Balance:				
End of year	**81**	**78**	**1,342**	**1,643**

8. Commitments

The Council is committed to disburse grants and scholarships in future years subject to the provision of funds by Parliament. Future year commitments are as follows:

(in thousands of dollars)

Year of Payment	1999	1998
1998-1999	–	210,280
1999-2000	245,331	137,959
2000-2001	188,551	81,754
2001-2002	117,494	31,297
2002-2003	46,969	11,601
2003-2004	27,230	1,375
2004-2005	5,021	–
2005-2006	898	–
	631,494	**474,266**

9. Uncertainty due to the Year 2000 Issue

The Year 2000 Issue arises because many computerized systems use two digits rather than four to identify the year. Date-sensitive systems may recognize the year 2000 as 1900 or some other date, resulting in errors when information using year 2000 dates is processed. In addition, similar problems may arise in some systems which use certain dates in 1999 to represent something other than a date. The effects of the Year 2000 Issue may be experienced before, on, or after January 1, 2000 and, if not addressed, the impact on operations and financial reporting may range from minor errors to significant systems failure which could affect an entity's ability to conduct normal business operations. It is not possible to be certain that all aspects of the Year 2000 Issue affecting the Council, including those related to the efforts of customers, suppliers, or other third parties, will be fully resolved.

SCHEDULE OF GRANTS AND SCHOLARSHIPS FOR THE YEAR ENDED MARCH 31, 1999

(in thousands of dollars)

	1999	1998
Grants		
Operating (Note 4)	149,444	127,760
Clinical Trials (Note 4)	4,465	4,389
Maintenance	3,325	3,694
Equipment	2,321	3,388
Health Services Research	2,000	2,000
Regional Partnerships (Note 4)	854	394
Breast Cancer Research Initiative	2,000	1,962
MRC Genome	334	390
Special Projects	2,325	2,252
University-Industry Grants	5,338	5,340
General Research Grants	1,600	–
	174,006	**151,569**
Multi-Disciplinary		
MRC Groups	22,090	18,856
Program Grants	1,810	3,786
Development Grants (Note 4)	31	134
	23,931	**22,776**
Salary Support		
MRC Groups	1,625	1,847
Development Grants	1,628	2,037
Career Investigators	498	673
MRC Scientists (Note 4)	4,502	4,241
Senior Scientists	1,150	863
Distinguished Scientists	958	762
Scholarships	9,021	7,997
Clinician Scientists 2	1,190	1,060
Regional Partnerships (Note 4)	643	15
University-Industry	1,019	1,007
	22,234	**20,502**
Research Training		
Clinician Scientists 1	1,008	1,119
Centennial Fellowships	741	787
Fellowships (Note 4)	9,218	8,726
Dental Fellowships	50	85
Studentships	9,176	5,936
Undergraduate Scholarships	533	404
Regional Partnerships Training Awards (Note 4)	18	6
University-Industry Training Awards	936	654
Partnerships Challenge Fund	1,693	–
	23,373	**17,717**
Travel and Exchange		
Visiting Scientists and Professorships	150	163
Travel Grants, Symposia and Workshops	137	119
	287	**282**
Other Activities		
President's Fund	524	550
Other Grants (Note 4)	1,177	1,177
	1,701	**1,727**
All Core Programs	**245,532**	**214,573**
Networks of Centres of Excellence	13,655	13,518
	259,187	**228,091**

Grants and Awards Peer-Review Committees

The membership of the following grants and awards peer review committees for 1998-99 is listed below. Only the professional degree and/or PhD (or equivalent) is given; the university affiliation follows the name (and/or if applicable, the name of the company is mentioned in the case of university-industry committee members).

BEHAVIOURAL SCIENCES "A"

Michael Meaney, Ph.D. . . . . .Douglas Hospital
(Chairperson/présidence)
Terence Picton, Ph.D. . . . . .Toronto
(Scientific Officer/adjoint scientifique)
Shimon Amir, Ph.D. . . . . .Concordia
Peter Cain, Ph.D. . . . . .Western Ontario
Alain Gratton, Ph.D. . . . . .Douglas Hospital
Zulfiquar Merali, Ph.D. . . . . .Ottawa
Bruce Schneider, Ph.D. . . . . .Toronto
Carlyle Smith, Ph.D. . . . . .Trent
Esther Strauss, Ph.D. . . . . .Victoria
Henry Szechtman, Ph.D. . . . . .McMaster
Barbara Woodside, Ph.D. . . . . .Concordia
Robert Zatorre, Ph.D. . . . . .McGill

BEHAVIOURAL SCIENCES "B"

Peter Williamson, M.D. . . . . .Western Ontario
(Chairperson/présidence)
Roberta Palmour, Ph.D. . . . . .McGill
(Scientific Officer/adjointe scientifique)
Roger Bland, MBCHB . . . . . .Alberta
Gregory Brown, M.D., Ph.D. . . . . .Toronto
Kathryn Gill, Ph.D. . . . . .McGill
Murray Grossman, M.D. . . . . .Pennsylvania
Stanley Kutcher, M.D. . . . . .Dalhousie
Peter Liddle, M.D., Ph.D. . . . . .British Columbia
Denis Richard, Ph.D. . . . . .Laval
Marc-André Roy, M.D. . . . . .Laval
Donald Stuss, Ph.D. . . . . .Toronto
Rosemary Tannock, Ph.D. . . . . .Toronto

Comités d'examen par les pairs des subventions et des bourses

Les membres des comités d'examen par les pairs des subventions et des bourses pour l'année 1998-1999 sont énumérés ci-dessous. On indique uniquement le diplôme professionnel ou le doctorat (ou un diplôme équivalent); le nom est suivi de l'université à laquelle appartient le membre en question; dans le cas du comité université-industrie, on mentionne la société, le cas échéant.

BIOCHEMISTRY & MOLECULAR BIOLOGY "A"

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(Scientific Officer/adjoint scientifique)
John Baenziger, Ph.D. . . . . .Ottawa
John Bell, Ph.D. . . . . .Ottawa
Bruce Hill, Ph.D. . . . . .Queen's
Jeremy Lee, Ph.D. . . . . .Saskatchewan
Bernard Lemire, Ph.D. . . . . .Alberta
David Rose, Ph.D. . . . . .Toronto
Alice Vrielink, Ph.D. . . . . .McGill
Gerard Wright, Ph.D. . . . . .McMaster

BIOCHEMISTRY & MOLECULAR BIOLOGY "B"

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(Chairperson/présidence)
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(Scientific Officer/adjoint scientifique)
Caroline Astell, Ph.D. . . . . .British Columbia
Richard Collins, Ph.D. . . . . .Toronto
Benoit Coulombe, Ph.D. . . . . .Sherbrooke
Patrick Dennis, Ph.D. . . . . .British Columbia
Hara Ghosh, Ph.D. . . . . .McMaster
James McGhee, Ph.D. . . . . .Calgary
Paul Melancon, Ph.D. . . . . .Alberta
Barbara Papadopoulou, Ph.D. . . . . .Laval
Martine Raymond, Ph.D. . . . . .Montréal

BIOMEDICAL ENGINEERING
GÉNIE BIOMÉDICAL

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(Scientific Officer/adjoint scientifique)
Brian Andrews, Ph.D. . . . . .Alberta
Jason Bates, Ph.D. . . . . .McGill
Peter Burns, Ph.D. . . . . .Toronto
Henrietta Galiana, Ph.D. . . . . .McGill
B. Milan Horacek, Ph.D. . . . . .Dalhousie
Daniel Houde, Ph.D. . . . . .Sherbrooke
Hubert Labelle, M.D. . . . . .Montréal
Roger Lecomte, Ph.D. . . . . .Sherbrooke
J. Michael Lee, Ph.D. . . . . .Dalhousie
Thomas Ruth, Ph.D. . . . . .British Columbia
Brian Rutt, Ph.D. . . . . .Western Ontario

CANCER "A"

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Sylvie Mader, Ph.D. . . . . .Montréal
Anne-Marie Mes-Masson, Ph.D. . . . . .Montréal
Morag Park, Ph.D. . . . . .McGill
Karl Riabowol, Ph.D. . . . . .Calgary
Hung-Sia Teh, Ph.D. . . . . .British Columbia
Michel L. Tremblay, Ph.D. . . . . .McGill
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Mladen Korbelik, Ph.D. . . . . .British Columbia
Pierre Laneuville, M.D. . . . . .McGill
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David Murray, Ph.D. . . . . .Alberta
F. William Orr, M.D. . . . . .Manitoba
Dindial Ramotar, Ph.D. . . . . .Montréal
Ming-Sound Tsao, M.D. . . . . .Toronto

CARDIOVASCULAR SYSTEM "A"
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Michael Ward, M.D., Ph.D. . . . . .McGill

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PHYSIOLOGIE CELLULAIRE

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ESSAIS CLINIQUES

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Mary Hannah, MDCM . . . . . .Toronto
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Song Fong Lee, Ph.D. . . . . .Dalhousie
J. Paul Santerre, Ph.D. . . . . .Toronto
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ENDOCRINOLOGIE

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(Boston)
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Samuel Lee, M.D. . . . . .Calgary
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Richard Woodman, M.D. . . . . .Calgary

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GÉNÉTIQUE

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Louise Simard, Ph.D. . . . . .Montréal
Peter St. George-Hyslop, M.D. . . . . .Toronto
Maria Zannis-Hadjopoulos, Ph.D. . . . . .McGill

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GÉNOMIQUE

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(Scientific Officer/adjoint scientifique)
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Pieter de Jong, Ph.D. . .State University of New York
Henry Krause, Ph.D. . . . . .Toronto
Paul Lasko, Ph.D. . . . . .McGill
Heather McDermid, Ph.D. . . . . .Alberta
Robert Moyzis, Ph.D. . . . . .California (Irvine)
Eric Shoubridge, Ph.D. . . . . .McGill
Jeremy Squire, Ph.D. . . . . .Toronto
Silvia Vidal, Ph.D. . . . . .Ottawa

HEALTH SERVICES RESEARCH
RECHERCHE SUR LES SERVICES DE SANTÉ

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(Scientific Officer/adjoint scientifique)
Owen Adams, B.A., M.A. . . . . .Ottawa
Régis Blais, Ph.D. . . . . .Montréal
Peter Coyte, Ph.D. . . . . .Toronto
Cameron Donaldson, Ph.D. . . . . .Calgary
Mita Giacomini, Ph.D. . . . . .McMaster
Vivek Goel, MDCM . . . . . .Toronto
Paula Goering, Ph.D., R.N. . . . . .Toronto
Robin Hanvelt, Ph.D. . . . . .British Columbia
Paul Hébert, M.D. . . . . .Ottawa
Andreas Laupacis, M.D. . . . . .Ottawa
Peter Norton, M.D., Ph.D. . . . . .Calgary
Louise Pilote, M.D., Ph.D. . . . . .McGill
Moira Stewart, Ph.D. . . . . .Western Ontario
David Streiner, Ph.D. . . . . .McMaster

IMMUNOLOGY & TRANSPLANTATION
IMMUNOLOGIE ET TRANSPLANTATION

Michael Julius, Ph.D. . . . . .Toronto
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Michael Ratcliffe, Ph.D. . . . . .McGill
(Scientific Officer/adjoint scientifique)
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Bosco Chan, Ph.D. . . . . .Western Ontario
Vincent Duronio, Ph.D. . . . . .British Columbia
David Kelvin, Ph.D. . . . . .Western Ontario
Timothy Lee, Ph.D. . . . . .Dalhousie
Jean Marshall, Ph.D. . . . . .Dalhousie
Walid Mourad, Ph.D. . . . . .Laval
Hanne Ostergaard, Ph.D. . . . . .Alberta
Trevor Owens, Ph.D. . . . . .McGill
Fumio Takei, Ph.D. . . . . .British Columbia
Gillian Wu, Ph.D. . . . . .Toronto
Li Zhang, M.D., Ph.D. . . . . .Toronto Hospital

METABOLISM & NUTRITION
MÉTABOLISME ET NUTRITION

Paul Pencharz, MBCHB, Ph.D. . . . . .Toronto
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Dennis Vance, Ph.D. . . . . .Alberta
(Scientific Officer/adjoint scientifique)
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Christine DesRosiers, Ph.D. . . . . .Montréal
Catherine Field, Ph.D. . . . . .Alberta
Victor Han, M.D. . . . . .Western Ontario
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C. Bruce Verchere, Ph.D. . . . . .British Columbia
Andrew Watson, Ph.D. . . . . .Western Ontario
Gerald Zamponi, Ph.D. . . . . .Calgary

MELSI (MEDICAL, ETHICAL, LEGAL AND SOCIAL IMPLICATIONS OF GENOMICS/GENETICS RESEARCH) REQUEST FOR PROPOSALS
DEMANDES DE PROPOSITIONS PORTANT SUR CERTAINES QUESTIONS D'ORDRE MÉDICAL, ÉTHIQUE, JURIDIQUE ET SOCIAL (MEJS) SOULEVÉES PAR LA RECHERCHE EN GÉNOMIQUE ET EN GÉNÉTIQUE

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(Chairperson/présidence)
Bartha Knoppers, LL.B. . . . . .Montréal
(Scientific Officer/adjointe scientifique)
Jane Evans, Ph.D. . . . . .Manitoba
Patricia Kaufert, Ph.D. . . . . .Manitoba
Gerald Robertson, LL.M., LL.B. . . . . .Alberta
David Roy, Ph.D. . . . . .Montréal
Burleigh Trevor-Deutsch, Ph.D. . . . . .Ottawa
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