

Institute of Infection and Immunity

Strategic Plan
2002



Science driven...

Integrating across disciplines...

Committed to partnership...

and better health for all Canadians



CIHR IRSC

Canadian Institutes of
Health Research

Instituts de recherche
en santé du Canada

Canada

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Foreword



The Institute of Infection and Immunity (III) is one of 13 institutes of the Canadian Institutes of Health Research (CIHR) that together share responsibility for implementing the mission and mandate of CIHR. As the founding Scientific Director of III, I strongly believe there has never been a better opportunity nor a greater need to shape a health research agenda in infection and immunity in Canada.

This, our first strategic plan, was developed in collaboration with our stakeholders across Canada – health research scientists, professional societies, non-profit agencies, patient groups and our Institute Advisory Board (IAB), chaired by Dr. Lorne Babiuk. It was developed as a framework to guide the Institute's development over its first five years.

We are committed to our vision and mission. In addition, we have established that flexibility and an ability to react quickly and coherently to new demands in the Canadian and global health research landscapes are critical capabilities that will be specifically maintained. We believe we are poised to implement the CIHR mandate and achieve our mission and vision by focusing on:

- supporting internationally competitive research
- stimulating knowledge exchange by translating research, including encouraging clinical and policy uptake and technology exploitation
- integrating research across the four CIHR themes (biomedical research, clinical research, health services and systems research; and research into the health of populations and the societal, cultural and environmental dimensions of health)
- partnership with stakeholders in infection and immunity health research

Finally, we anticipate that the development of this plan is the first step in a continuous and iterative process — one that will involve many other stakeholders and Institutes. It will be revised and updated on a regular basis. Our goal is to provide the leadership, innovative programs and resources to achieve CIHR's mandate and our own vision and mission. The potential rewards of nurturing research excellence and innovative health research advances are what drive this process. We are developing strong communication links to all stakeholders to ensure this happens.

Bhagirath Singh, PhD
Scientific Director, CIHR Institute of Infection and Immunity
Scientist, Robarts Research Institute
Professor, The University of Western Ontario



Executive Summary

This is the first strategic plan developed for the Institute of Infection and Immunity (III) – one of 13 virtual institutes of the Canadian Institutes of Health Research (CIHR). As articulated in this document, our strategic plan is provided for all stakeholders in a health research agenda pertaining to infection and immunity. We expect that this plan will be a “living document”; this is merely the first step in a continuous and iterative process – one that will involve many stakeholders and institutes.

Mission: Establish national leadership, priorities and programs that promote innovative research to reduce the global burden of infection and immune-based diseases and improve the quality of life.

Vision: Achieve national and global leadership by strongly supporting research in health and public policy on infectious disease control, and on the harnessing of healthy immune responses to protect against or mitigate health challenges.

To broaden, enhance and complement investigator-initiated research in the areas of infection and immunity, the Institute will develop Requests for Applications (RFA) through priority-setting exercises involving our Institute Advisory Board and stakeholders. After extensive consultation over the past year across Canada, the Institute has identified the following strategic research priority themes for initial development:

Research Training and Career Development

Innovation in attracting, training and retaining a broad spectrum of health researchers prioritized within the broad complementary areas of “microbes and disease pathogenesis” and “host defence and health” is key to the Institute’s long-term goal of building research capacity and disease-preventive strategies.

Microbial Safety of Food and Water

The growing concern about the microbial safety of food and drinking water and its impact on our social, psychological and economic well-being requires interventions informed by systematic research initiatives and effective knowledge translation.

Antimicrobial Resistance in Pathogens

From a public health perspective, drug resistance caused by increased and/or inappropriate drug use is a growing health and environmental threat. The extensive use of antibiotics in livestock and pesticides on crops is contributing to the creation of drug-resistant disease-causing microbes.

The HIV/AIDS Health Challenge

HIV/AIDS is a global health problem with serious social and economic impacts. A new research strategy is needed to increase the quality and duration of life of HIV-infected individuals, to reduce disease transmission and progression and to improve treatment.

Hepatitis C/Blood-borne Infections

Liver disease due to the hepatitis C virus is a major and growing health problem and building research capacity in this area is an urgent priority.

Innovative Vaccine Development and Delivery

Vaccines are safer and more cost-effective than other therapeutic interventions for infectious diseases. Vaccine development and delivery platforms coupled with mechanisms for rapid knowledge translation are crucial research areas for future challenges to infectious diseases and microbial pathogens.

Asthma, Allergy, Host Resistance and Innate Immunity

Asthma and allergy are growing health problems in young children and adults. Research is needed to understand the interactions among predisposing genes, allergens, environmental factors and the host immune system to better treat diseases in these areas.

Autoimmune Diseases, with a Focus on Type 1 Diabetes

Autoimmune diseases such as lupus, rheumatoid arthritis, type 1 diabetes and multiple sclerosis cause major suffering and morbidity. Research efforts that integrate new knowledge of genetics, immunology and molecular biology are needed to understand, manage and prevent autoimmune diseases and their complications.

Stem Cell Biology, Transplantation and Regenerative Medicine

Tissue regeneration and replacement are likely to become important therapeutic modalities for many diseases resulting in end-stage organ failure. Research in transplantation and stem cell biology offers both great opportunities and significant challenges, especially with regard to ethical and legal considerations.

Response to Emerging Challenges

Health disparity in rural and inner city areas, global health problems and the threat of biological terrorism require collaborative research efforts, with the co-ordinated support of other CIHR institutes, governmental and non-governmental partners.

While III has established that all areas of health research based in infection and immunity are priorities, it has decided to focus on the strategic research priorities listed above for initial program development. Among the 13 institutes, the Institute of Infection and Immunity currently has the third-largest funding base of the investigator-initiated CIHR programs. III proposes to develop novel funding mechanisms through RFA for innovative proposals that will complement research already funded through investigator-initiated grants. Our goal is to plan strategically rather than comprehensively and specific strategic priorities have been selected to fill critical gaps or develop new research capacities. A major initiative in knowledge translation specific to infection and immunity research has also been slated for development.

Using standard measures of research impact, we expect to monitor and measure our progress and impact with respect to the four over-arching directions articulated by CIHR in the document *r:evolution – CIHR: Towards a National Health Research Agenda*:

- How III is contributing to building international leadership through national excellence in health research
- How III initiatives are playing a role in integrating the biomedical, natural and social sciences, engineering, mathematics and the humanities
- How III initiatives are helping to improve the health status of vulnerable populations
- How III is playing a role in strengthening health research and the health system in the genomics era

The Institute also expects to act on unique challenges in infection and immunity as they arise to effect positive outcomes for the health of Canadians.

The Institute will target its initiatives by using four specific strategies:

- Supporting internationally competitive research by developing and advancing a research agenda, building capacity through research training and focusing on major gaps
- Translating research results and contributing to public policy issues by stimulating knowledge translation
- Integrating the four CIHR health research themes (biomedical science, clinical science, health services and systems research; and research into the health of populations and the societal, cultural and environmental dimensions of health)
- Partnering with other CIHR institutes, funding agencies, volunteer sector organizations and professional associations in sectors relating to infection and immunity



1.0 Introduction and Background

1.1 Critical Need

- Diseases due to infection and immune disorders are some of the most costly health care problems in Canada and worldwide.
- These major health care problems are becoming more complex, more difficult to treat and more expensive due to factors such as antibiotic and antiviral resistance, the immunocompromised status of patients, and environmental stresses.
- Infectious and immune-related disorders and diseases affect all sectors of our society and have particularly significant impacts on vulnerable populations.

Infectious disease and diseases related to immune dysfunction remain as major threats to human health throughout the world. More than a third of all deaths worldwide are due to infectious diseases, which are the largest single cause of productivity loss in Canada. Moreover, immune disorders that cause conditions including diabetes, rheumatoid arthritis and lupus typically strike relatively young, productive individuals, leading to long-term disability and death.

For infectious and immune-based diseases, the complexity of both diseases and treatments is increasing. Resistance to antibiotics and antiviral agents is making some of the most powerful drugs ineffective, and the prevalence of “superbugs” with resistance to multiple antibiotics is on the rise. New viral and bacterial threats are emerging, and these threats often present new therapeutic challenges. Other important challenges include the growth of the pool of susceptible hosts (especially the immunocompromised and the aging), the emergence and re-emergence of infectious diseases, and risks from biological warfare or terrorism. Similarly, resistance to existing antimicrobials (antibacterials, antivirals, antifungals and antiparasitics) is of tremendous concern because of the reduced efficacy of these medications in combating disease-causing organisms. For example, multiresistant pneumococci, methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE) are becoming urgent health care issues as in some cases there is no treatment alternative. Evolving pathogens from abroad – such as antibiotic-resistant tuberculosis or multiresistant malaria introduced into Canada through trade, travel and the globalization of the food supply – are also clearly problematic. At the same time, researchers are developing a broader understanding of the possible microbial origin of important diseases that have traditionally been classified as “chronic.” This understanding is particularly important in view of the increased susceptibility to microbial diseases of Canada’s aging population.

The Canadian media have recently focused on another emerging threat posed by microbes: the safety of our food and water. Food- or water-borne illnesses, including “hamburger disease” and diarrhea, cause millions of children’s deaths annually in developing countries. These illnesses also cause occasional but serious and life-threatening outbreaks and loss of productivity in Canada. Moreover, the advent of infectious bovine spongiform encephalopathy (BSE or mad cow disease) in cattle and the recognition of a possible relationship to Creutzfeldt-Jakob disease in humans have sent a shock wave through Europe, which was followed in 2001 by a foot-and-mouth disease epidemic that had tremendous economic impact. The ramifications extend to Canada’s donated blood supply, which is vital to the entire health care system, and has already encountered major systemic contamination by HIV and hepatitis and may be vulnerable to other diseases such as BSE.

All of these concerns, in the context of the current therapies for infectious and immune-related diseases, make this a high priority area in any country’s health care research agenda.

1.2 History and Background of the Institute

The Institute of Infection and Immunity (III) is one of 13 institutes of the Canadian Institutes of Health Research (CIHR) that together share responsibility for achieving the principal objective of CIHR:

“... to excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian health care system” (CIHR Act).

All 13 Institutes have been created to promote and build upon Canada’s foundation of health research excellence with support from volunteer, professional and lay communities. They are expected to engage the research community and encourage interdisciplinary and integrative health research. Through their scientific directors and Institute Advisory Boards, and under the guidance of the Governing Council, the Institutes will work together to forge a health research agenda across disciplines, sectors and regions. This agenda is expected to embrace scientific opportunity and reflect the emerging health needs of Canadians, the evolution of the health care system and the information needs of health policy decision-makers. Each Institute is expected to facilitate partnerships and work to accelerate the transfer of knowledge into benefits for Canadians.

Dr. Bhagirath Singh was appointed Scientific Director of the Institute of Infection and Immunity in December 2000. Dr. Lorne Babiuk was appointed Chair of the III Institute Advisory Board in January 2001. The IAB was appointed by the Governing Council and includes:

Lorne A. Babiuk, PhD, DSc, FRSC, FIDSA (IAB Chair), Director, Veterinary Infectious Disease Organization, Canada Research Chair in Vaccinology, and Professor in the Department of Veterinary Microbiology, University of Saskatchewan, Saskatoon, Sask. *Areas of expertise:* viral pathogenesis, vaccine development and delivery.

Michel G. Bergeron, MD, FRCPC, Director, Division of Microbiology and Infectious Diseases Research Centre, Laval University, Sainte-Foy, Que. *Areas of expertise:* infectious diseases, antimicrobial resistance, AIDS, pathogenesis.

R. Chris Bleackley, PhD, Professor, Department of Biochemistry, University of Alberta, Edmonton, Alta. *Areas of expertise:* molecular and cellular analysis of lymphocyte functions.

Abdallah Daar, DPhil (Oxon), FRCPC (Lon), FRCS, FRCSEd, Professor, departments of Public Health Sciences and Surgery, University of Toronto, Toronto, Ont. *Areas of expertise:* bioethics, transplantation.

B. Brett Finlay, PhD, Professor, Biotechnology Laboratory, University of British Columbia, Vancouver, B.C. *Areas of expertise:* bacterial diseases, virulence mechanisms, cellular microbiology, pathogenesis, *E. coli* and *Salmonella*.

Jack Gauldie, PhD, FRSC, Professor and Chairman, Department of Pathology and Molecular Medicine, McMaster University, Hamilton, Ont. *Areas of expertise:* gene therapy, immunomodulation.

Kevin Glasgow, MD, MHSc, MBA, DTM&H, FACPM, FRCPC, Chief Executive Officer, Cardiac Care Network of Ontario, Assistant Clinical Professor, Department of Family Medicine, McMaster University; Lecturer, Department of Public Health Sciences, University of Toronto, Toronto, Ont. *Areas of expertise:* infectious diseases research background from population health, clinical trial, and basic research perspectives, including experience in international health and the pharmaceutical industry.

Philip Halloran, MD, PhD, Professor, Department of Medicine, Director, Division of Nephrology and Immunology at University of Alberta, Edmonton, Alta. *Areas of expertise:* transplantation biology, immunosuppressive drugs and clinical transplantation.

Noni MacDonald, MD, MSc, FRCPC, Dean, Faculty of Medicine, Dalhousie University, Halifax, N.S. *Areas of expertise:* vaccine research, viral infections in children with chronic diseases, cystic fibrosis, STD prevention and diagnosis in adolescents.

Danielle Malo, DMV, PhD, Associate Professor, McGill University Health Centre and Montreal General Hospital, Montreal, Que. *Areas of expertise:* host resistance, infectious diseases, complex trait analysis, *Salmonella*, mouse models of disease.

William Paul, MD, Chief, Laboratory of Immunology, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, Md. *Areas of expertise:* immunoregulation, cytokines.

Francis Plummer, MD, FRCPC, Scientific Director, National Microbiology Laboratory, Health Canada, Winnipeg, Man. *Areas of expertise:* HIV/AIDS, infectious diseases.

Helaine Shiff, Member, Research Partnership Program for the Juvenile Diabetes Research Foundation; Partner, Focus on You Consultants, Toronto, Ont. *Areas of expertise:* communications, fundraising, volunteer organizations.

Bhagirath Singh, PhD, Scientific Director, CIHR Institute of Infection & Immunity; Professor, Department of Microbiology and Immunology, University of Western Ontario and Scientist, Robarts Research Institute, London, Ont. *Areas of expertise:* molecular immunology, antigen presentation, microbial regulation of autoimmunity, diabetes.

Steffanie Strathdee, PhD, Associate Professor, Infectious Diseases Program, Department of Epidemiology, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md. *Areas of expertise:* HIV/AIDS, epidemiology.

Robyn M. Tamblyn, PhD, Associate Professor, Department of Medicine, Health Services and Outcomes Research Group, Royal Victoria Hospital, Montreal, Que. *Areas of expertise:* epidemiology, health services, drug utilization, knowledge translation and evaluation.



2.0 Strategic Planning Process

2.1 Background and Rationale

In March 2001, the Institute embarked on a strategic planning process to set its direction and identify strategic research priorities for its first five years. The Institute Advisory Board first met in March 2001 to discuss its mandate and responsibilities. The framework for accepting proposals for the funding of workshops and meetings was established, and the vision, mission and guiding principles were developed. In concert with Institute priority-setting exercises, CIHR's Governing Council requested a Strategic Direction Outlook in June 2001, a summary strategic plan in November 2001 and a full draft strategic plan for March 2002. Planning processes were designed to build on the extensive consultation conducted during the start-up phase of the Institute. The Institute sought to identify and refine the key research themes of initial priority and to target the actions that would position the Institute as an international leader in its field. The process engaged consultation between the Institute Advisory Board and the community throughout and included a number of steps:

- Interviews and requests for broad participation and suggestions from constituents, key stakeholders, societies, professional organizations, health charities and the lay community
- Development of criteria for establishing research priorities
- Establishment of strategic research priorities
- Identification of mechanisms for advancing the research agenda
- Thematic and research priority-setting workshops
- Development of an implementation framework and timelines
- Finalization of a strategic plan for submission to CIHR

2.2 Framework for Planning and Priorities

At the beginning of the priority-setting process, the Institute Advisory Board articulated the following guiding principles from which our vision and mission developed and which provided a context for the planning process:

- Base initiatives on high-quality science:
 - short-term strategic initiatives based on existing excellence
 - long-term initiatives to build capacity and excellence in areas with identified gaps
- Build partnerships and relationships for priority development and leveraging of national initiatives
- Design and develop research funding programs that integrate at least two of the four CIHR research theme areas and build intra-institutional research
- Provide research funding necessary and sufficient for impact over the short- and long-term
- Provide rapid and research-based responses to challenges and urgent health care issues related to III
- Address knowledge gaps in areas under the III mandate
- Demonstrate the importance of Institute activities for the long-term health and health care of Canadians

Mission: Establish national leadership, priorities and programs that promote innovative research to reduce the global burden of infection and immune-based diseases and improve the quality of life.

Vision: Achieve national and global leadership by strongly supporting research into health and public policy issues of infectious disease control and the harnessing of healthy immune responses to protect against or mitigate health challenges.

2.3 Strengths, Opportunities and Challenges

The information gathered during the consultation process yielded significant insights into the current strengths of our research environment, as well as the opportunities and challenges facing the Institute and its priority-setting exercises. A summary of strengths, opportunities and challenges is provided in Table 1.

Table 1

Canadian Strengths in Health Research in Infection and Immunity

- Creation of CIHR with its mandate of transforming health research in Canada
- New federal and provincial government awareness of the importance of research to the health of Canadians
- Federal commitment to increased investment in innovation
- Existence of many non-governmental organizations and agencies with which to partner and to foster research and collaborations
- A foundation of excellence in infection and immunity research and a strong history of collaborations among III researchers as indicated by two Networks of Centres of Excellence: the Canadian Bacterial Diseases Network and the Canadian Network for Vaccines and Immunotherapeutics
- Models for the integration of many research disciplines to combat specific diseases
- International links of III-associated researchers to global health problems

Challenges and Opportunities for Health Research in Infection and Immunity

- Establish a national health research agenda in infection and immunity
- Fund critical gaps in research in areas of high priority for the Institute
- Enhance communication and knowledge translation of Canadian research to stakeholders
- Develop a process to identify future large projects using new and evolving technologies
- Mobilize resources against new challenges and threats such as food and water safety, antimicrobial resistance and biological terrorism
- Form partnerships with other CIHR institutes, voluntary sector agencies and provincial and federal government departments
- Perform knowledge translation to facilitate clinical development and the uptake of technologies, therapeutics and vaccines
- Act on global health research opportunities in Institute priority areas
- Focus on health research in vulnerable populations in both rural and urban areas



3.0 Strategic Research Themes

3.1 Criteria for Selecting Research Priorities

The information-sharing and consultation process, undertaken at the inception of the Institute, yielded more than 65 topics judged relevant and valuable to advancing knowledge in the fields of infection and immunity. The multiple-step strategic planning process included significant input from stakeholders. The following criteria (see Table 2), established by CIHR in consultation with the scientific directors of its 13 Institutes, were key in selecting research priorities. CIHR guidelines for prioritizing requests for applications (RFA) are provided in section 5.3.

Table 2

Criteria for Prioritizing Strategic Initiative Ideas for Action

- All initiatives must address research that is both ethical and excellent
- Initiatives must focus on and develop those criteria embodied in the CIHR Act:
 - Advance science
 - Improve health
 - Encourage innovation
 - Build capacity
 - Promote integrated approaches across CIHR themes, research disciplines, communities
 - Potential to improve effectiveness of health services and products
- All Initiatives must also contribute to:
 - National competitive advantage/niche
 - Ability to obtain partnership funding
- Initiatives will address CIHR over-arching goals:
 - Building international leadership through national excellence in health research
 - Integrating biomedical, natural and social sciences, engineering, mathematics and the humanities
 - Improving the health status of vulnerable populations
 - Strengthening health research and the health system in the genomics era

3.2 Establishing Strategic Research Priorities

3.2.1 Overview

The Institute of Infection and Immunity has established that all areas of research into aspects of human health and disease based in infection and immunity are priorities for the Institute and areas where we will provide national leadership. The Institute will strongly encourage development of integrated health research programs in all areas under the III mandate, and has selected a number of strategic research priorities for program development in the first years of its mandate. Our rationale is to develop novel funding mechanisms for innovative proposals that will complement investigator-initiated research already funded. RFA funding decisions from III will be based upon our strategic research priorities, and will be designed to enhance and broaden health research by establishing and nurturing a new research area, addressing gaps that exist in investigator-initiated research capacity or fostering new opportunities that span the priorities of multiple Institutes.

In addition, a preliminary list of large, cross-Institute CIHR strategic initiatives (CCSI) has been selected by the CIHR Research Priority and Planning Committee (RPPC) and will be considered for funding from a central pool of strategic funds (see Table 3). Most of these CIHR cross-cutting initiatives intersect III strategic research priority areas, and are thus aligned with our strategic plan.

Table 3

CIHR Cross-Institute Strategic Initiatives (CCSI)

1. Genetics and Environmental Interactions in Determining Health and Disease
2. Regenerative Medicine
3. Rural and Northern Health
4. Reducing Health Disparities and Promoting the Health of Vulnerable Populations
5. Clinician-Scientists: Recruitment and Retention
6. Environment Influences on Health
7. Global Health Research
8. Tobacco Abuse and Nicotine Addiction
9. Strategic Injury Research Initiatives

3.2.2 Strategic Research Priorities

To broaden, enhance and complement investigator-initiated research in the areas of infection and immunity, the Institute will develop Requests for Applications through priority-setting exercises with our Institute Advisory Board and stakeholders. After extensive consultations over the past year across the country, the Institute has identified the following initial strategic research priority themes for development:

Research Training and Career Development

Innovation in attracting, training and retaining a broad spectrum of health researchers prioritized within the complementary areas of “microbes and disease pathogenesis” and “host defence and health” is key to the Institute’s long-term goal of building research capacity and devising disease-preventive strategies. This research priority area intersects CCSI 5.

Goals

- Support innovative and transdisciplinary research training programs in infectious diseases, microbiology and host immune defence
- Increase capacity in health research through clinician-scientist career development programs

Microbial Safety of Food and Water

The growing concern about the microbiological safety of food and drinking water and its impact on our social, psychological and economic well-being requires interventions informed by systematic research initiatives and effective knowledge translation. This research priority area intersects CCSI 1, 3, 4, 6 and 7.

Goals

- Develop a framework and mechanism for the co-ordination of a national strategy with various stakeholders for research leading to microbiologically safe food and water
- Enhance our ability to predict and prevent conditions that lead to disease by understanding the complex dynamic among pathogens, host carriers and the environment

Antimicrobial Resistance

From a public health perspective, drug resistance caused by increased and/or inappropriate drug use is a growing health and environmental threat. The extensive use of antibiotics in livestock and pesticides on crops is contributing to the creation of drug-resistant disease-causing microbes. This research priority area intersects CCSI 1, 4, 6 and 7.

Goals

- Establish a national strategy with various stakeholders for research into the epidemiological, health care and socioeconomic practices that cause antimicrobial resistance in microbes
- Increase our understanding of the genomes of pathogens and use this knowledge to identify new therapeutic targets and diagnostic tests for resistance genes

The HIV/AIDS Health Challenge

HIV/AIDS is a global health problem with serious social and economic impacts. A new research strategy is needed to improve the quality and duration of life of HIV-infected individuals, reduce disease transmission and progression, improve treatment and reduce drug toxicity. This research priority area intersects CCSI 4, 6 and 7.

Goals

- Establish a national HIV/AIDS research advisory partnership involving stakeholders from research, health care and affected communities
- Support research into the translation and evaluation of novel interventions for HIV prevention
- Expedite research into the elucidation of mechanisms responsible for the adverse effects of HIV therapies
- Develop mechanisms and partnerships to support the HIV/AIDS global health research effort

Hepatitis C/Blood-borne Infections

Liver disease due to the hepatitis C virus is a major and growing health problem, and building research capacity in the area of blood-borne infections is an urgent priority. This research priority area intersects CCSI 4, 6 and 7.

Goals

- Develop an estimate of the burden of disease in Canada and define risk factors for transmission, viral clearance and progression of hepatitis C infection in different populations
- Catalyze research programs that fill specific gaps in research into hepatitis C and blood-borne infections, their transmission and progression
- Characterize the impact of HIV-HCV co-infection on the progression of both diseases

Innovative Vaccine Development and Delivery

Vaccines are safer and more cost-effective than other therapeutic interventions for infectious diseases. Research in vaccine development and delivery platforms, coupled with mechanisms for rapid knowledge translation, are crucial areas for future challenges to infectious diseases and microbial pathogens. This research priority area intersects CCSI 1, 3, 4 and 7.

Goals

- Develop new technological platforms, methods, vaccine targets, formulations and delivery systems for the induction and measurement of mucosal, humoral and cell-mediated immunity against viral or bacterial infections of importance to human health, including hepatitis C and HIV/AIDS
- Explore public health concerns involving cost, efficacy and ethical issues in the use of vaccines

Asthma, Allergy, Host Resistance and Innate Immunity

Asthma and allergy are growing health problems in young children and adults. Research is needed to understand the interactions among predisposing genes, allergens, environmental factors and the host immune system to better treat diseases in these areas. This research priority area intersects CCSI 1 and 6.

Goals

- Support the development and use of new technologies in immunology and microbiology to determine the role of infectious agents and environmental factors in the development of disease
- Develop new molecular biological tools to identify markers of disease and risk factors underlying the onset, progression and severity of asthma and allergy
- Support the exploration of host resistance factors and innate immune responses to prevent infections that may trigger and aid the progression and severity of allergy, asthma and other immunological diseases

Autoimmune Diseases, with a Focus on Type 1 Diabetes

Autoimmune diseases such as lupus, rheumatoid arthritis, type 1 diabetes and multiple sclerosis cause major suffering and morbidity. Research efforts that integrate new knowledge of genetics, immunology and molecular biology are needed to understand, manage and prevent autoimmune diseases and their complications. Research is also needed to elucidate the basic mechanisms and the genetic and environmental factors that may cause autoimmune diseases. The Institute's initial focus on type 1 diabetes is based upon the establishment of critical cross-institute and partnership opportunities. This research priority area intersects CCSI 1, 4 and 6.

Goals

- Promote interdisciplinary programs focused on understanding the common mechanisms that cause autoimmune diseases and support research into the health impacts of new therapies for the management and prevention of such diseases
- Support novel and innovative genetic, immunological and cell-based therapies to predict, prevent and manage type 1 diabetes and its complications

Stem Cell Biology, Transplantation and Regenerative Medicine

Tissue regeneration and replacement are likely to become important therapeutic modalities for many diseases resulting in end-stage organ failure. Research in transplantation and stem cell biology offers both great opportunities and significant challenges, especially with regard to ethical and legal considerations. This research priority area intersects CCSI 2.

Goals

- Support research in the development of new bioinformatics systems that integrate both traditional clinical techniques and new molecular markers to expand knowledge about the factors underlying acute and chronic graft rejection
- Support research in new therapeutic strategies that induce effective immunological tolerance to prevent graft loss
- Expand research capacity in the use of stem cells to address health problems and support social and ethical impact studies of the use of stem cells for tissue and cell transplantation and organ regeneration

Response to Emerging Challenges

Health disparity in rural and inner city areas, global health problems and the threat of biological terrorism require collaborative research efforts with the co-ordinated support of CIHR institutes, governmental and non-governmental partners.

Goals

- Support collaborative health research initiatives in vulnerable, rural and northern populations
- Support global health research as a cross-institute CIHR theme, in collaboration with other CIHR institutes, government agencies and non-governmental organizations
- Support the creation of a new Network of Centres of Excellence in biosecurity to conduct research on emerging biological threats to human health and our food and water supply



4.0 Partnerships and Knowledge Translation

4.1 Partnership Development

It is clear that many organizations, professional associations, societies, charities, private sector organizations and government agencies share the goals and interests of the Institute. These groups bring valuable expertise, commitment, excitement and resources to potential research initiatives directed at improving the health of all Canadians. Thus, it is critical for III to elucidate strategies to develop and strengthen the links, collaborations and partnerships with other Institutes, external organizations and groups.

Currently the Institute welcomes input from all stakeholders and incorporates this into decision-making processes and strategic planning. Since December 2000, the III Scientific Director has been meeting constantly with stakeholders, interest groups and organizations, and has participated in numerous meetings across Canada and internationally. Ideas and strategies from such partnership meetings were tabled with the Institute Advisory Board and integrated into Institute planning exercises.

As the Institute moves forward, it will develop a partnership strategy by:

- Formulating criteria to guide the Institute in developing partnerships
- Working with the CIHR Strategic Partnerships and Alliances Branch in identifying and developing potential partnerships
- Providing partners the opportunity to participate in all Institute activities, such as the development of training programs and new strategic initiatives, the creation or support of workshops, the formulation of Requests For Applications on specific research themes, information dissemination, research transfer, and monitoring and measuring outcomes and communications
- Establishing an Institute-specific database or inventory of organizations, agencies, groups and consortia that may be potential partners for research scientists
- Conducting workshops with various stakeholders and industry representatives to explore opportunities

4.2 Knowledge Translation

Knowledge translation is the exchange, synthesis and ethical application of knowledge among researchers and users to accelerate the capture of the benefits of research. In the transformation from MRC to CIHR, CIHR was given a mandate for establishing a health research agenda for Canada. Knowledge translation is one of the enabling mechanisms that will ensure this transformation.

The CIHR vision is to create new knowledge and effectively translate it into improved health and more effective health services and products, with the major outcomes being better health care and healthier Canadians. The Institute of Infection and Immunity also recognizes the importance of translating research to effectively inform policy makers, health care providers and the Canadian public. The Institute believes this is critical to achieving the national and international impacts expected to accrue from research supported by CIHR in the areas of infection and immunity. Because III is more than a health research funding mechanism, we plan to develop strong communication links with research and stakeholder communities. In addition, it is critical to be responsive to individual research scientists in all areas of our mandate to facilitate flexibility and the evolution of our strategic plan.

While III research can be considered well established in biomedical and clinical science theme areas, the Institute must implement enhanced knowledge translation so that it can develop its future plans to support and build research capacity in health services and systems research, and research into the health of populations and the societal, cultural and environmental dimensions of health. In addition, specific strategic priority themes such as HIV/AIDS, food and water safety and autoimmunity require interdisciplinary research that crosses the CIHR theme areas, and tailor-made knowledge translation strategies.

Institute knowledge translation activities will mirror those proposed by CIHR in “A Framework for Knowledge Translation.” III will focus on:

- Developing new methods of knowledge translation while funding the training of new scientists and novel RFA
- Establishing knowledge translation mechanisms with our partners in the health research community
- Utilizing knowledge translation mechanisms to build a Canadian health research agenda in infection and immunity

A number of strategies and actions have been proposed through our strategic planning process. III will develop a process that informs and engages policy-makers, and a work plan for knowledge translation and outreach that targets the health provider community and the general public. The Institute will explore potential partnerships to leverage existing outreach and dissemination mechanisms.



5.0 Implementation

5.1 Strategies and Actions to Advance Initiatives – The III Development Approach

The Institute will target its initiatives using four specific strategies:

- Supporting internationally competitive research by developing and advancing a research agenda, building capacity through research training and focusing on major gaps
- Translating research results and contributing to the resolution of public policy issues by stimulating knowledge translation
- Integrating the four CIHR health research themes (biomedical research, clinical research, health services and systems research; and research into the health of populations and the societal, cultural and environmental dimensions of health)
- Partnering with other CIHR Institutes, other funding agencies, volunteer sector organizations, and professional associations in sectors relating to infection and immunity

The Institute has defined a modular approach that facilitates a cohesive III-specific protocol for development activities (see Table 4). Selected modules may be omitted for some initiatives, but the majority of these elements will be needed for major strategic initiatives and multiple iterations may be indicated in certain cases. Strategic initiatives will be designed to catalyze existing research programs that fill significant complementary research gaps or that maintain, attract or establish new expertise or increased capacity.

Table 4

III Development Approach

- Conduct a broad-based consultation with stakeholders
- Organize partnership meetings to inform national III policy and health research agenda
- Involve the Institute Advisory Board in prioritizing new opportunities
- Develop, facilitate or fund workshops to establish partnerships and alliances
- Validate approaches and proposed funding mechanisms at consensus conferences
- Investigate an integrated approach with other Institutes or the CIHR Secretariat
- Draft the RFA/strategic initiative
- Lead development of integrated approaches or programs for building capacity in new areas in collaboration with existing funding strategies/partners
- Launch the RFA/strategic initiative
- Track the RFA/strategic initiative using measurable outcomes and report in the III annual report

5.2 Summary of Initial Activities

To achieve the goals of the Institute, the focus in the first year is to target activities that build a strong foundation for supporting the Institute's mandate, such as providing for workshops and supporting a number of partnered strategic initiatives. From its inception, the III has undertaken the following actions: 1) strategic initiatives, 2) formalized partnerships and affiliations, and 3) development activities.

5.2.1 Strategic Initiatives

CIHR Interdisciplinary Training Programs

Training programs based around existing teams of researchers and targeted towards building the capacity of Canada's research community were one of the first major strategic initiatives launched. For the Institute of Infection and Immunity, applications were invited for all areas of its mandate, with a specific focus on research in hepatitis C, allergy and asthma, and the microbial safety of food and water.

Health Research Programs of Excellence

Health Research Programs of Excellence are trans-disciplinary research programs representing at least two of the four themes of health research with an emphasis on research translation between the themes. In the first launch of this program, the Institute requested applications in the areas of *Innovation in Organ and Cell Transplantation* and *Innovative Vaccine Development and Delivery to Prevent Infectious Diseases*.

New Emerging Teams (NET) Program

The NET program is designed to catalyze the creation or development of teams of independent investigators undertaking collaborative multidisciplinary research in Canadian research institutions. Anchored around at least two investigators with an established track record in areas relating to the projects in the program, the initiative is intended to foster the development of new researchers in target areas. In its first iteration, the Institute called for applications in *Type 1 Diabetes and its Complications* and in *Asthma and Allergy*.

Clinician-Scientists in Infectious Diseases

In a unique partnership with the Office of the Chief Scientist and the National Microbiology Laboratory of Health Canada, the Institute of Infection and Immunity has agreed to co-fund clinician-scientists who will undertake research in the area of infectious disease pathogens and who will work at the National Microbiology Laboratory, the first facility in the world designed to accommodate both human and animal level 4 pathogen research laboratories.

In all of these initiatives, the active participation of partners is a key factor in their ultimate success. Major partners include the Juvenile Diabetes Foundation International, the CIHR Institute of Nutrition, Metabolism and Diabetes, the CIHR Institute of Human Development, Child and Youth Health, the CIHR Institute of Circulatory and Respiratory Health, and Health Canada. Extending and enhancing partnership participation in both the strategic and development activities of the Institute will be an ongoing goal for III.

5.2.2 Formalized Partnerships and Alliances

A number of partnerships and alliances that will directly impact the strategic activities of the Institute have been formalized in Letters of Agreement or Memoranda of Understanding. Such instruments clarify the scope and roles of partners in the funding, stewardship and reporting of joint initiatives. Many of these alliances will directly support strategic programs. Five such agreements that have implications for III were signed in 2001:

Letter of Agreement for HIV/AIDS Extramural Research: *Transfer of Funds and Administrative Responsibility from Health Canada to CIHR*

Memorandum of Understanding in Support of Better Health for the Poor – A Canadian Collaboration for Global Health: *A partnership between the Canadian International Development Agency, CIHR, Health Canada and the International Development Research Centre*

Memorandum of Understanding for New Emerging Teams in the Research Areas of Type 1 Diabetes and its Complications: *A partnership between the Juvenile Diabetes Research Foundation International, the CIHR Institute of Nutrition, Metabolism and Diabetes, the CIHR Institute of Human Development, Child and Youth Health, and the CIHR Institute of Infection and Immunity*

Memorandum of Understanding to Fund Clinician Scientists in Infectious Disease Research: *A partnership between the Office of the Chief Scientist (Health Canada), the National Microbiology Laboratory (Health Canada), and the CIHR Institute of Infection and Immunity*

Memorandum of Understanding between the Hepatitis C Disease Prevention, Community-based Support and Research Program [Health Canada] and the Medical Research Council [now CIHR]: *A partnership to fund research and training programs in the area of hepatitis C*

CIHR - INS (Mexico) Memorandum of Understanding for Research Collaborations: *An agreement between CIHR and Mexico's Institutos Nacionales de Salud to pursue joint research programs*

5.2.3 Development Activities

The Institute has initiated activities directed at the development of new funding programs and RFA. Early in January 2001, the Scientific Director established a schedule of visits to major centres in Canada and the United States to meet scientists representing all disciplines of infection and immunity research. These consultation visits and “town hall meetings” established a dialogue with III’s research community from which the strategic priority areas and ideas for RFA developed.

Other development activities include III participation in consensus meetings with research partners, other CIHR institutes and the CIHR Secretariat. Since the Institute’s inception, III has been actively involved in, and/or has developed consensus meetings in the areas of global health, rural health, microbial safety of food and water and HIV/AIDS research. Outcomes from these meetings were incorporated into III priority setting and RFA development agenda. In addition, III has funded a number of specific workshops in other areas of its mandate in priority areas under development.

5.3 Future Research Development Activities

As III looks to 2002/03 and beyond, it will continue to develop actions that address specific research priorities. Consensus workshops and conferences will be important tools in developing RFA and the expectation is that the III will support at least one major Request for Applications annually over the next five years. The timing and amount of investment in these RFA will be subject to:

- Annual availability of CIHR strategic funding envelopes to the Institutes
- Partnership initiatives and the ability to leverage support and funding from alternate sources
- Scientific advances that result in revised priority research areas
- Cross-cutting themes developed by the CIHR Research Priority and Planning Committee
- Readiness and capacity of the research community for a specific initiative



6.0 Expected Outcomes and Measures of Success

In order for III to assess its impact on the Canadian health research landscape, it must establish ways to monitor and measure its progress toward its intended goals and objectives. At the outset, its goals will be those already identified by CIHR. Other goals may be added as measurement criteria are refined or as III determines other means to appropriately measure the realization of its goals. To monitor its performance the Institute will be establishing a database of sponsored RFA and participants. Specific outcomes will be examined in each of CIHR's four over-arching directions and in areas of emerging challenges and opportunities.

Building international leadership through national excellence in health research

The Institute will be tracking funded RFA and will be summarizing the outcomes of the research in terms of international impact (publications, invited lectures), increased capacity (training of new scientists and their placement after training), and innovation (uptake of technologies and research in science, technology and health care).

Integrating the biomedical, natural and social sciences, engineering, mathematics and the humanities

Within its strategic areas, the Institute will develop mechanisms for funding workshops, symposia, and cross-Institute RFA or RFP (Requests for Proposals) that seek to establish novel research initiatives utilizing the expertise of partners from non-traditional health research areas. A possible outcome of such activities will be to enhance the integration of multiple scientific disciplines to address health issues in unique ways. The goals of the process are to form new partnerships and research collaborations.

Improving the health status of vulnerable populations

III expects that most of its RFA will have an impact on many populations that are especially vulnerable to disease – the elderly, the very young, aboriginal Canadians and disadvantaged people in both rural and urban settings. For all RFA where III is the lead sponsor or partner, III will be attempting to quantify research outcomes as they pertain to vulnerable populations and to facilitate appropriate knowledge translation in order to maximize impact.

Strengthening health research and the health system in the genomics era

The Institute will be involved in RFA and training programs where genomic and proteomic approaches will be utilized. It will also target microbial genomics, vaccines, host defence and transplantation as areas for genomic research development.

Emerging challenges and opportunities

The Institute has proposed a number of strategic priority areas that are clearly unique challenges for the health care system and the health research community. III expects that strategic initiatives in these areas will make an impact internationally on health services and health research. Specifically, III has identified regenerative medicine and biosafety as research areas where Canada has the potential to make an impact. III will determine research outcomes and identify impacts on health services in these areas as a monitor of its performance.



7.0 Conclusion

Since the appointment of its scientific director in December 2000, III in its consultation and strategic planning process has engaged a broad stakeholder group, a process that facilitated direction-setting and the identification of strategic research priorities.

This first strategic plan provides a framework to guide the development of the Institute. The plan will be reviewed on an annual basis and revised as necessary, with the intention for the plan to continually reflect a five year horizon.

The Institute plans to provide sufficient structure, resources, leadership and flexibility to respond to the opportunities and challenges in health research in infection and immunity that will evolve over the next several years.