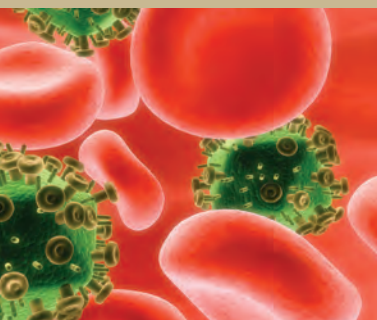


CIHR INSTITUTE OF INFECTION AND IMMUNITY

# Strategic Plan 2013-18



The Canadian Institutes of Health Research (CIHR) is the Government of Canada's health research investment agency. CIHR's mission is to create new scientific knowledge and to enable its translation into improved health, more effective health services and products, and a strengthened Canadian health care system. Composed of 13 Institutes, CIHR provides leadership and support to more than 12,600 health researchers and trainees across Canada.

The CIHR Institute of Infection and Immunity has the mandate to support research to enhance immune-mediated health and to reduce the burden of infectious disease, immune-mediated disease and allergy through prevention strategies, screening, diagnosis, treatment, support systems and palliation. The III mandate transcends disciplines and encompasses all four CIHR health research themes.

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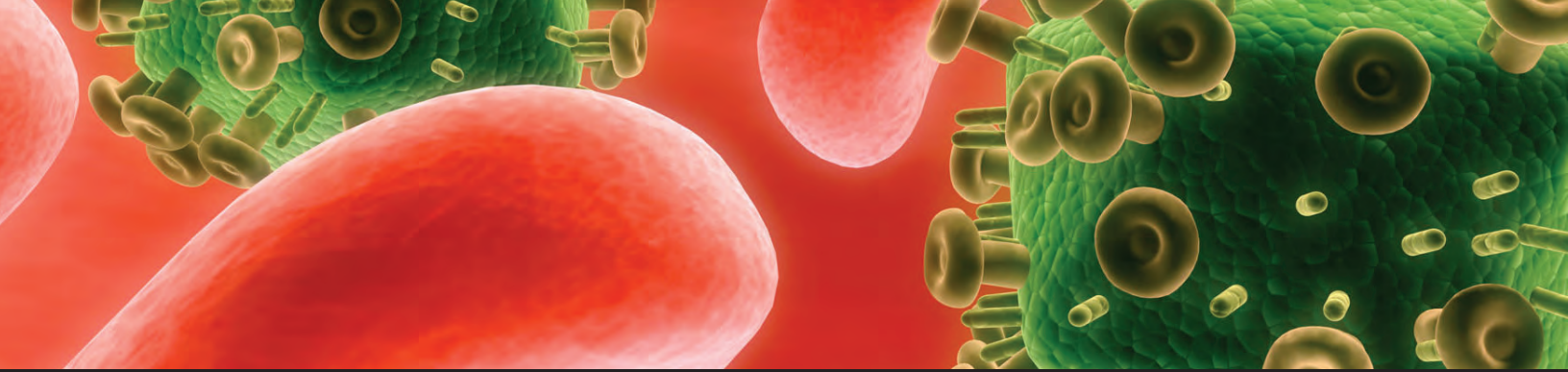
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## MESSAGE FROM THE SCIENTIFIC DIRECTOR



The CIHR Institute of Infection and Immunity (CIHR-III) is entering into its second decade of existence with great excitement. Infection and Immunity (I&I) research is of critical relevance to the health of Canadians. Better sanitation, large-scale vaccination, antibiotics, and public health programs have had a positive impact on health and reduced the burden of communicable diseases. However, despite these advances, the rate of infections has nonetheless steadily increased since 1980<sup>1</sup> and hospital-acquired infections, often resistant to antibiotics, are a new plague affecting 10% of admitted patients in Canada<sup>2</sup>.

There is much to be proud of in the past accomplishments of III, and these were highlighted in the 2011 International Review of CIHR. The Canadian I&I research community has a long tradition of research excellence and success in CIHR funding opportunities: \$246M was invested in research related to the III mandate in 2012-13 alone. Situated within this strong research environment, the role of the Institute is to catalyze strategic research that will complement investments in investigator-driven research. The Institute, on behalf of CIHR and in partnership with the Public Health Agency of Canada, provides leadership on specific research

programs such as the Federal Initiative to address HIV/AIDS in Canada, the Hepatitis C Research Initiative, and a clinical influenza vaccine network stemming from the former Pandemic Preparedness Strategic Research Initiative. These research programs allow the Institute to increase the scope of research in the field of I&I with the potential to significantly impact the health of Canadians. The role of the Institute extends far beyond its funding activities. Indeed, the Institute is involved in several non-funding activities for research capacity building, knowledge translation, networking activities, citizen and stakeholder engagement, and in building relationships with the public and the research community.

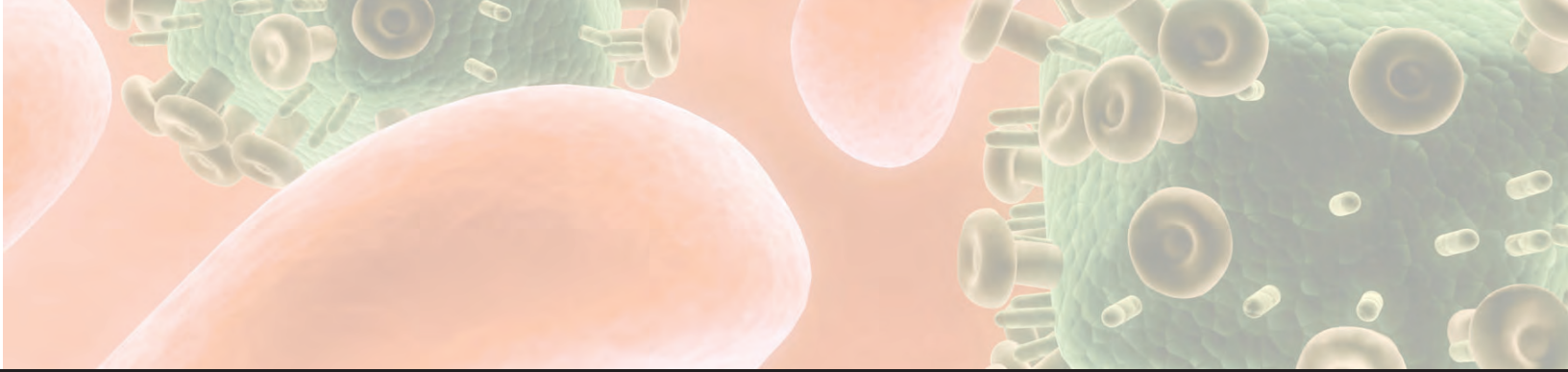
The role of the Institute is more critical than ever as the issues of infection and immune-related diseases are, surprisingly, on the rise. This may be associated with new societal profiles which lead to antibiotic resistance, ageing of populations and multi-chronicity of diseases.

Since its inception in 2001, the Institute has witnessed several outbreaks (e.g. SARS; contaminated food and water supplies; and pandemic (H1N1) and seasonal influenza) with significant socio-economic and public health impacts.

Several infections, due to progresses in research and treatment, are now considered, at least in Canada, to be chronic diseases (e.g. HIV/AIDS, hepatitis C). Other infections are known to cause diseases such as cancer, but the importance of microorganisms to overall health has only recently come to light. The microbiome, the collection of microbial cells within our body, is a key determinant of health and of our immune system.

<sup>1</sup> <https://apps.who.int/whr/2001/archives/1996/50facts.htm>

<sup>2</sup> Clin Microbiol Rev. 2011 January; 24(1): 141-173.



Perturbation of the microbiome is correlated with many chronic conditions and furthermore, several million Canadians are affected by autoimmune diseases which constitute a growing cause of chronic illness. Most chronic diseases have a strong immune component often linked to inflammatory pathways. Chronic inflammation contributes to a plethora of chronic and infectious conditions and is also a critical aspect of transplant rejection. Expensive therapeutic modalities are being developed for several immune based conditions but more precise diagnostics and stratification of patients will be required to optimize the use of new therapies.

The 2013-18 Strategic Plan builds on the strengths of the Institute, but also expands on those areas described above requiring further attention. The Strategic Plan will serve as a framework to guide future strategic research investments in the field of I&I while bridging and uniting I&I research. The Strategic Plan is intended to be complementary to the CIHR Strategic plan, and will clearly outline where active participation in signature initiatives will help to achieve the Institute's objectives. Our new Strategic Plan has two overall objectives that will enhance the excellence of the Institute: 1) Strengthening and coordinating infection and immunity research; and 2) Facilitating the application and impact of research

The research strengthening and coordination that III will spearhead will revolve around two priorities. The first is preparing and responding to current and emerging threats to health, and will favour activities related to emerging infections, antimicrobial resistance, vaccines, diagnostics and environmental threats to health. The second priority will be in the

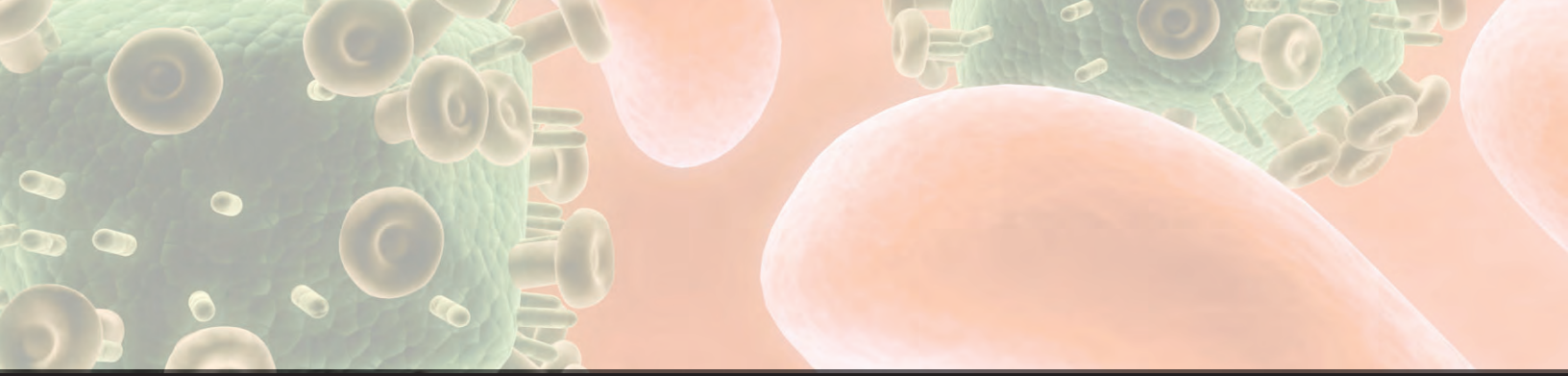
Our new Strategic Plan has two overall objectives that will enhance the excellence of the Institute:

- 1) Strengthening and coordinating infection and immunity research; and
- 2) Facilitating the application and impact of research

integration of infection and immunity knowledge in the control and prevention of chronic diseases. Our efforts will focus on research in inflammation (including microbiome and transplantation research), human immunity, and chronic viral diseases such as HIV and hepatitis C.

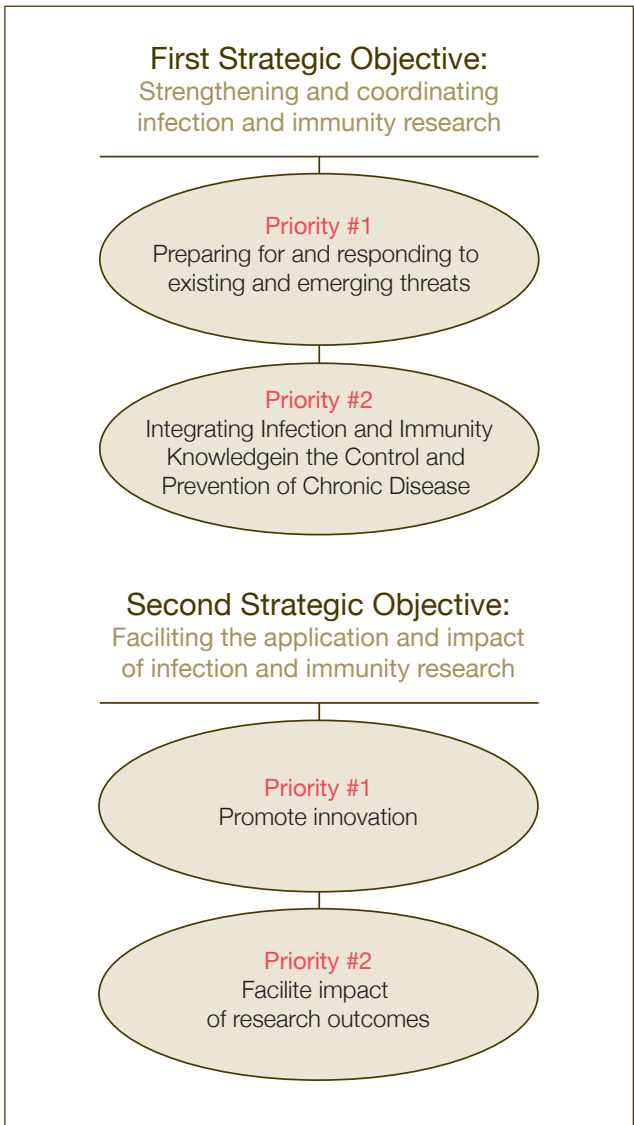
Our second objective, to facilitate the application and impact of research, is also composed of two priorities: The first is promoting innovation, while the second is facilitating the impact of research outcomes. These priorities will be achieved by proactively supporting networking and collaborative activities at national and international levels, assisting the I&I research community in knowledge translation activities, engaging end-user communities, and monitoring and evaluating outcomes for Institute-led initiatives.

The Institute has been fortunate, since its inception in 2001, to have the support and participation of individuals who believe in its mandate and mission. The inaugural Scientific Director, Dr. Bhagirath Singh, created a tradition of excellence that we are striving to emulate. The smooth functioning of the

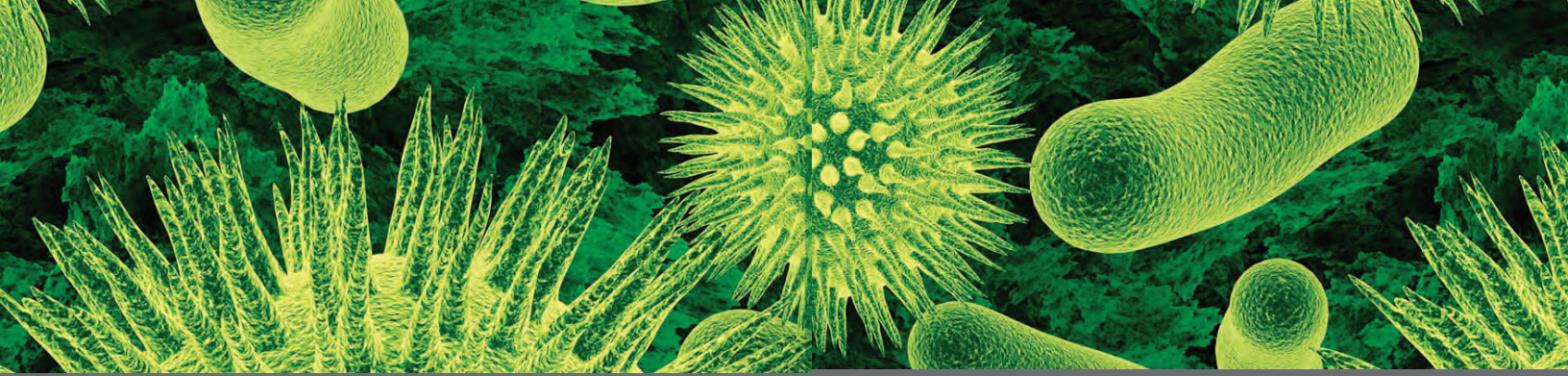


Institute is currently dependent on highly dedicated staff based in Ottawa and in Quebec City. The development of this Strategic Plan was made possible by the dedication and vision of the Institute Advisory Board Chair Dr. Anthony Jevnikar, and the Advisory Board members, who represent all aspects of the III mandate from coast to coast. I would like to thank Dr. Judith Bray for the first drafts of the Plan, the Advisory Board Strategic Plan subcommittee Dr. Anthony Jevnikar, Dr. Brenda Hemmelgarn and Ms. Aida Fernandes for their valuable contributions, and finally the current Institute Advisory Board members for the fulsome discussions during the development of the Plan. Finally, I would like to express my admiration for the research excellence that the I&I community demonstrates on a daily basis. Your contributions to knowledge creation and application are an inspiration for the Institute and have a tangible impact for the health of Canadians and the global community.

Marc Ouellette  
Scientific Director



Overview of the CIHR Institute of Infection and Immunity Strategic Plan 2013-18



# CIHR ORGANIZATION

## The Canadian Institutes of Health Research (CIHR)

Established in 2000, CIHR is the Government of Canada's primary health research funding agency, promoting a multidisciplinary and collaborative approach to health research. CIHR supports health research across four broad themes: biomedical; clinical; health systems and services; and the social, cultural and environmental factors that affect the health of populations. CIHR is comprised of thirteen virtual Institutes, one of which is the Institute of Infection and Immunity.

## CIHR Mandate

The mandate of CIHR is 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 Strategic Directions and Research Priorities

In the 2009-14 CIHR Strategic Plan, "Health Research Roadmap: Creating innovative research for better health and health care", CIHR identified four strategic directions:

- ✱ Invest in world-class research excellence;
- ✱ Address health and health system research priorities;
- ✱ Accelerate the capture of health and economic benefits of health research;

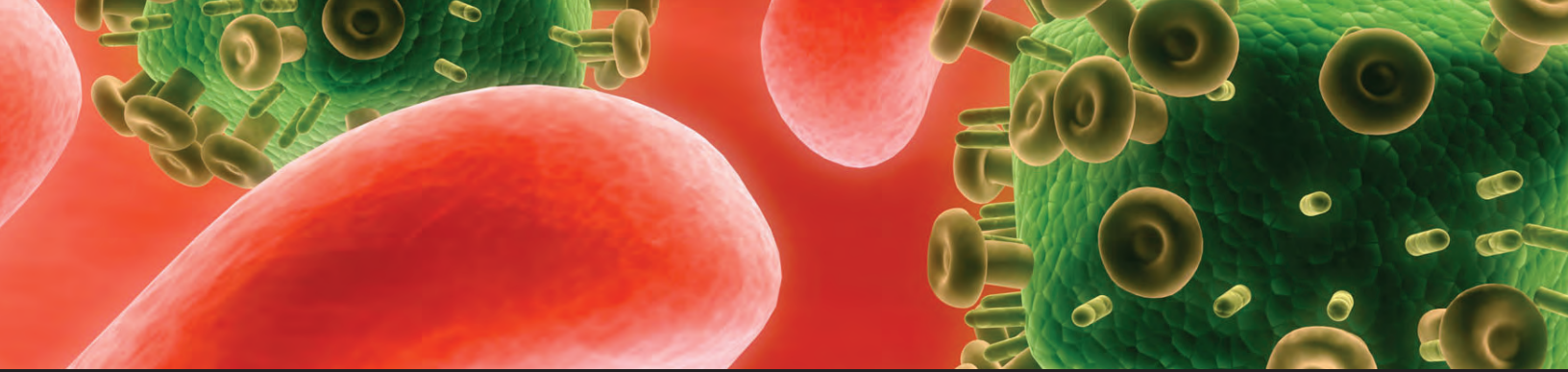
- ✱ Achieve organizational excellence, foster ethics and demonstrate impact.

The Roadmap also identified five major priority research areas that would provide a strategic focus for the organization during the five-year period of the strategic plan:

- ✱ Enhance patient-oriented care and improve clinical results through scientific and technological innovations;
- ✱ Support a high-quality, accessible and sustainable health-care system;
- ✱ Reduce health inequities of Aboriginal peoples and other vulnerable populations;
- ✱ Prepare for and respond to existing and emerging threats to health;
- ✱ Promote health and reduce the burden of chronic disease and mental illness.

As part of the implementation of the Roadmap, CIHR launched an environmental scan and evaluation process to attain greater focus and impact from strategic research investments in health and health care. The result was the development of the following eight transformative signature initiatives that will transcend traditional borders and engage a wide range of stakeholders:

- ✱ Canadian Epigenetic, Environment and Health Research Consortium;
- ✱ Inflammation in Chronic Disease;
- ✱ Community-Based Primary Health Care;
- ✱ Personalized Medicine;
- ✱ Evidence informed Healthcare Renewal;
- ✱ International; Collaborative research Strategy for Alzheimer's Disease;
- ✱ Pathways to Health Equity for Aboriginal Peoples;
- ✱ Strategy for Patient-Oriented Research (SPOR).



## OUR INSTITUTE

### Our Mandate

The Institute of Infection and Immunity has the mandate to support research to enhance immune-mediated health and to reduce the burden of infectious disease, immune-mediated disease and allergy through prevention strategies, screening, diagnosis, treatment, support systems and palliation. The III mandate transcends disciplines and encompasses all four CIHR health research themes.

### Our Vision

III will become the Canadian focal point of reference to harness and optimize the research efforts in infectious and immune-related diseases.

III will become the national and international reference in the utilization and implementation of those research results for the improvement of the health care system.



*Bacteria (green) growing on a solid support (brown)*

### Our Mission and Values

The Institute's mission is to provide national leadership, priorities and programs to promote novel I&I research. We strive to promote health and reduce the global burden of infection and immune-based diseases through an approach based on CIHR's overarching core values of: excellence; scientific integrity and ethics; collaboration; innovation; and public interest.

### Our Resources

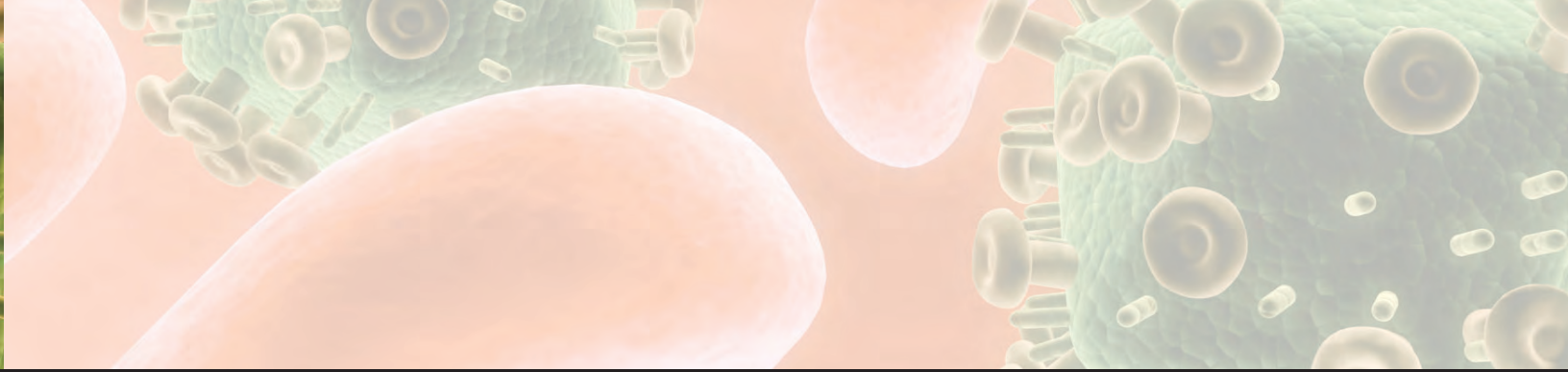
The Institute has core staff based in Ottawa and Quebec City and is guided in its activities by an Institute Advisory Board comprising leading national and international researchers, and representatives of partner organizations and industry. Like every CIHR Institute, III manages a core strategic research budget of \$8.5 million per year. In addition, III also manages close to \$1 million per year to support research and training related to hepatitis C, 1.5 M\$ per year to support an influenza vaccine research network, and \$22.5 million per year for the CIHR HIV/AIDS Research Initiative. The HIV/AIDS initiative is managed by an Ottawa-based team reporting to the III Scientific Director, and has its own advisory board and strategic plan<sup>3</sup>.

### Our Operational Practices

The Institute serves as a catalyst for research within the I&I community, through Institute Advisory Board meetings, distribution of Institute newsletters, and by maintaining a presence at meetings, workshops and annual conferences. The Institute fosters networking and collaborations, nationally and internationally, to strengthen I&I research, leverage funds and open new doors for knowledge translation.

<sup>3</sup> <http://www.cihr-irsc.gc.ca/e/37801.html>





III ensures that research outcomes are communicated to the Government of Canada and promoted to the Canadian public through funding announcements, media releases, and citizen engagement activities such as the Café Scientifique program. The Institute maintains a database of experts in the I&I field to advise governments and other stakeholders in times of national crisis or when faced with unexpected public health challenges.

### **Our Unique Research Challenges**

Infectious diseases remain the third leading cause of death worldwide<sup>4</sup>, which highlights the need for our continued intense efforts in improving understanding, identifying effective strategies and developing new therapies. The World Health Organization reports that at least 30 new diseases have been scientifically recognized around the world in the last 20 years and often have emerged without warning, while diseases from the past are re-emerging. In Canada, the total cost of treatment and lost productivity associated with infectious diseases is estimated to exceed \$12 billion each year. Increasingly, microorganisms are also being linked to the etiology of chronic diseases such as certain cancers, obesity, diabetes, asthma and cardiovascular disease.

The global impact from autoimmune diseases and chronic organ failure is similarly growing, not only in morbidity and mortality, but also in expensive therapeutic modalities. Many chronic diseases have a strong immune component that trigger the onset of illness or lead to organ failure by inflammatory pathways. Chronic inflammation is a contributing factor in the etiology of many diseases

including asthma, cardiovascular disease, arthritis, diabetes, dementia and cancer. Inflammation is also a factor in chronic infections such as hepatitis C and HIV, and is a critical aspect of transplant rejection. Of particular importance is the growing appreciation of the interaction of microbial infections in chronic immune based disease, by shaping immune responses and by promoting inflammation.

### **Building on our Successes**

The I&I research community is well established with a long history of research excellence that predates the creation of CIHR. Infection and immunity research remains relatively well funded through the CIHR open competitions, particularly in the biomedical research theme. In 2012-13, alone, \$246 million were invested to support research related to the III mandate. The quality of this investigator-initiated research is outstanding and internationally competitive. The Institute will continue to work hard to provide a landscape conducive to research excellence. Situated within this strong basic research landscape, the primary role of the Institute is to support and provide added value to the excellent research currently being undertaken by the I&I research community. This strategic role enables III to bring researchers, stakeholders and potential partners together to foster new collaborations that can extend the scope of the research, increase the relevance to patient populations and focus the community on specific health research priorities.

Since 2001, III has supported and coordinated strategic opportunities addressing identified gaps, needs and priorities with the intent of complementing the strong research base supported through the

<sup>4</sup> <http://www.who.int/mediacentre/factsheets/fs310/en/index.html>



open competitions. Examples include:

- ✦ Training the next generation of infection and immunity researchers through investment in the CIHR Strategic Training Initiative in Health Research (STIHR) program; and the organization of a biennial New Investigator Forum;
- ✦ Building capacity in undeveloped research areas, through initiatives such as the Canadian Human Microbiome and Novel Alternatives to Antibiotics;
- ✦ Promoting national and international collaborations such as the Canada/UK Partnership on Antibiotic Resistance, and other emerging programs in vaccines, HIV, and the microbiome;
- ✦ Facilitating rapid research responses to emerging threats such as SARS, Bovine Spongiform Encephalopathy, Clostridium difficile, and pandemic influenza;
- ✦ Managing novel funding programs that bring diverse research communities together to address specific unmet needs such as the CIHR Transplantation Research Program and the HIV/AIDS Community Based Research Program;
- ✦ Pursuing collaborations with the Public Health Agency of Canada (PHAC) in Institute priority areas.

### 2011 CIHR International Review Observations

In the 2011 CIHR International Review, III was commended for many of its leadership efforts and strategic research initiatives. Specifically mentioned were:

- ✦ Establishment of priorities and programs likely to have an impact in reducing the global burden of infection and immune-based diseases;
- ✦ Transformative training and capacity building;
- ✦ Increased researcher career development;
- ✦ Institute engagement of diverse groups of partners and stakeholders, particularly in the development of rapid responses to emerging infections;
- ✦ Development and implementation of community-based research activities, primarily through the HIV/AIDS Initiative.

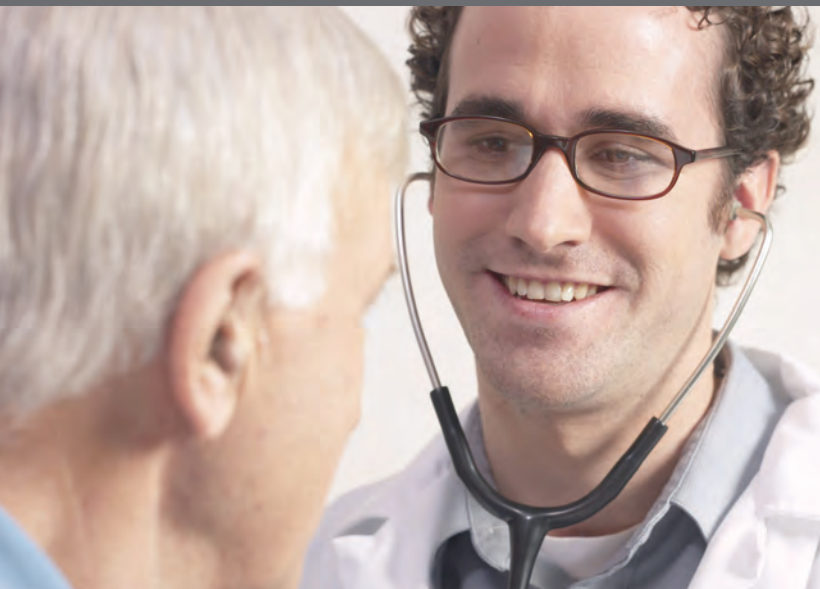
The III Expert Review Team identified the following specific areas that required attention and greater focus:

- ✦ Achieving synergy across the four health research themes;
- ✦ Enhancing reach and breadth of external communications;
- ✦ Strengthening knowledge translation including incorporating strategies to promote the uptake of research outcomes into improved products and services through a more entrepreneurial approach;
- ✦ Consulting with the international community when setting research priorities and planning new research programs;
- ✦ Tracking progress and monitoring success stories from III-funded initiatives.

The Institute's strategic directions and related activities described in the following sections specifically address these recommendations.



## THE III STRATEGIC PLAN FOR 2013-18



### Our Planning Process

The goal of the Institute strategic plan is to provide guidance to the Institute, and to allow III to harness the strengths of the I&I research community. This plan was developed through an extensive two-year consultation with past and current Institute Advisory Board members, members of the broader I&I research community and representatives of key stakeholder groups and organizations in order to address the mandate of III and the needs of the I&I research community. Our strategic plan was also formed on the consultative foundation provided by the 2009-14 CIHR Strategic Plan: *Health Research Roadmap: creating innovative research for better health and health care* as III strategic directions and research priorities aligned well with those in the overarching CIHR Roadmap.

### Our 2013-18 Strategic Objectives

The directions outlined within the III plan will advance and promote research within identified priority research areas within the Canadian I&I research landscape, and will further enhance the goals of CIHR signature programs.

III will capitalize on opportunities that will engage our research community in international activities to broaden the scope and potential impact of Canadian research. Examples include: a Canada/China partnership in the area of vaccine development; a potential partnership with the EU Joint Programming Initiative on antimicrobial resistance that builds on our existing partnership with the UK Medical Research Council on antibiotic resistance.

The Institute Scientific Director sits on the management board of several international research efforts, including the International Human Microbiome Consortium, the Canadian Initiative for HIV Cure Research, and the Canadian HIV Vaccine Initiative. Through active participation on these boards, the Institute aligns its strategic initiatives in priority research areas with complementary international efforts for greater impact. Domestically, the Institute will pursue productive collaborations with PHAC and will nurture ongoing discussions and interactions with national agencies such as the National Research Council of Canada (NRC) and Department of National Defence (DND), as well as provincial and non-governmental organizations.

At the end of our consultative process, III identified two main strategic objectives that will shape the



Institute activities and research priorities for the period 2013-18:

- 1) Strengthening and coordinating infection and immunity research; and
- 2) Facilitating the application and impact of research

These objectives are not only key for III, but are also closely aligned with CIHR signature initiatives, funding opportunities, international partnerships, and knowledge translation initiatives.

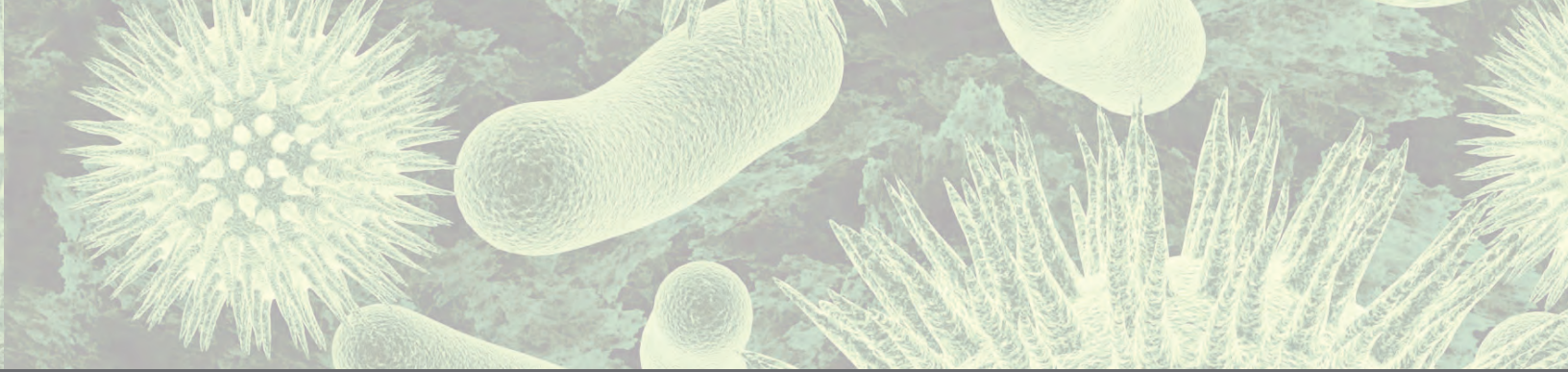
## Objective 1: Strengthening and Coordinating Infection and Immunity Research

There is a strong knowledge creation component in the field of I&I funded through investigator-initiated research and training programs. However, science is now increasingly multi-disciplinary, and multi-theme, team-based approaches are increasingly best suited to tackle complex health issues. III is committed to exploring and expanding opportunities that encourage collaborative research between the two broad research “arms” of the Institute and between researchers working in the different health research themes. The Institute’s role extends to encouraging new collaborations across the broader health research community and the four CIHR themes, including building bridges between the physical and life sciences.

The Human Microbiome Initiative serves as one example of an III initiative that brought together immunologists and microbiologists, as well as nutritionists, gastroenterologists and public health researchers around a single research theme – the role of the human microbiome in health and disease. Similarly, the Pandemic Preparedness Strategic Research Initiative brought together immunologists, infectious disease specialists, public health researchers, ethics experts and mathematical modelers to form an ongoing network, poised to respond to future outbreaks. Going forward, the Institute is collaborating with PHAC on a vaccine



*Helicobacter pylori* and cocci



network to improve the rapid response to threats, and is engaged in discussion with international collaborators regarding initiatives for patient management during severe epidemics.

In the next five years, III will continue to provide new opportunities for the I&I research community to transcend their traditional boundaries by encouraging and facilitating the development of novel research collaborations likely to advance research outcomes and impact more directly on the health of Canadians. Our consultation process led to the selection of two priority areas where we will focus our efforts to strengthen and coordinate I&I research. These priorities are: 1) Preparing for and responding to existing and emerging threats and 2) Integrating infection and immunity knowledge in the control and prevention of chronic diseases, and they are well aligned with the CIHR Roadmap.

### **Priority 1: Preparing for and responding to existing and emerging threats**

The public health issues addressed by the Institute in recent years, as well as the potential initiative partnerships presented by national and international stakeholder organizations, were taken into consideration when III identified the sub-topics of interest under the priority of existing and emerging threats. These sub-topics can easily be integrated under common initiatives. Furthermore, these sub-topics will allow III to not only build on previous successes, but to leverage the investments made through earlier initiatives, and to take advantage of signature initiatives opportunities. The sub-topics are antimicrobial resistance, existing and emerging microbial threats, environment and health, vaccine development, and improved diagnostics.

#### **Sub-Topics for Priority 1: Preparing for and responding to existing and emerging threats**

- \* Antimicrobial resistance;
- \* Existing and emerging microbial threats;
- \* Environment and health;
- \* Vaccine development;
- \* Improved diagnostics.

Antibiotic-resistant infections in health care settings and in the community at large are increasing within Canada and globally. Mortality and morbidity add a significant financial burden to the healthcare system in terms of increased hospitalization times and the requirement for longer and more expensive treatments. Concomitant with the rise in antibiotic resistance, large pharmaceutical companies are producing fewer new antibacterial products. For those that do actually make it to market, resistance is rapidly acquired. The result is an escalating problem with both hospital-, and community-acquired resistant organisms or “superbugs”. The rapid rise in resistance further underscores the importance of disease prevention, rapid diagnostics, and prompt and appropriate treatment.

The Institute has reacted swiftly in the past to address existing and emerging threats such as SARS and pandemic influenza, and will respond appropriately with modified research priorities if a new infection of significant public health importance were to arise. Old infections are re-emerging as exemplified by the rates of tuberculosis in some Northern and urban communities. Our participation in the Pathways to Health Equity for Aboriginal Peoples signature initiative will bring the Institute



into implementation research in attempts to reduce tuberculosis incidence.

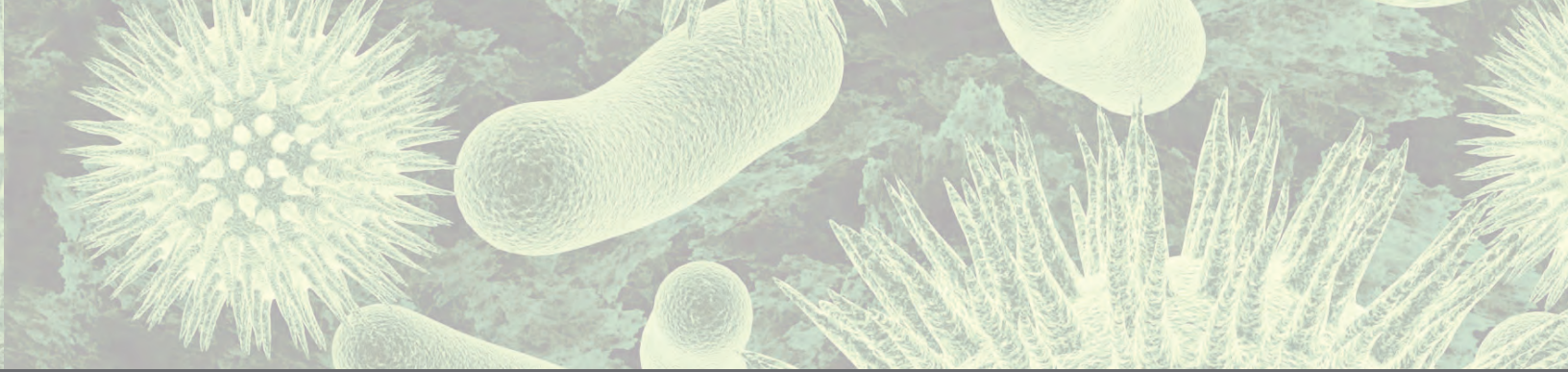
The Institute will also play a leadership role in developing a future signature initiative in the area of environments and health. Environmental factors are increasingly impacting human health, from the design of shelter and neighborhoods to the effects of climate change and globalization on disease transmission, to the more insidious threats of toxins in the natural and built environments.

Additionally, while numerous important advances have been made on the vaccine front, it remains a significant focus for III. Vaccine research to-date has allowed the fostering of collaborations with human immunology and infectious diseases specialists, ethicists, and public health research experts. Through national and international opportunities, the Institute will pursue investments in vaccine research as a means of preventing infections due to existing and emerging threats and of mitigating the public health impact of such infections. Vaccines are being developed for chronic diseases with a viral etiology such as HIV or HCV, and also against various cancers, diabetes, and neurodegenerative diseases. Efforts will be made to leverage the vaccine expertise of the I&I community to carry out innovative research for preventing a plethora of chronic diseases. The Institute is fully engaged in a vaccine research, development and innovation federal action plan with several federal partners, which should favor knowledge creation and translation. Several vaccine initiatives overlap with the Strategy for Patient-Oriented Research (SPOR), a research signature initiative for which the vision is to improve health outcomes and enhance patients' health



through integration of evidence at all levels in the health care system.

The ability to rapidly and accurately diagnose infections as viral or bacterial in origin, and to determine which specific pathogen is at work, is a long-held goal of the infectious disease community. This would enable front-line health care workers to administer the appropriate treatment at the earliest possible stage, and eliminate unnecessary or ineffective antibiotic use. This also aligns with one of the goals of SPOR which seeks to establish an integrated, leading-edge pan-Canadian clinical research infrastructure along the full continuum of patient-oriented research. Stratification of patients will become essential when applying expensive innovative modalities for immune-based diseases. The Institute is a partner in the Personalized Medicine signature initiative, which has the potential to make substantial advances using biomarkers for informed decision-making.



### **Core Actions for Priority 1: Preparing for and Responding to Existing and Emerging Threats**

- ✳ Promote the development and commercialization of new products and strategies in the field of antibiotic resistance, vaccines and diagnostics;
- ✳ Facilitate networking and collaborative opportunities with international partners in sub-priority areas including rapid response to emerging threats;
- ✳ Link efforts in the Personalized Medicine signature initiative for improved diagnostics and prognostics of infectious and immune diseases;
- ✳ Address the challenge of tuberculosis in northern Canada via the Pathways to Health Equity for Aboriginal Peoples signature initiative and implementation research;
- ✳ Co-lead a new signature initiative on environment and health emphasizing the One Health concept to improve prevention strategies against emerging threats;
- ✳ Support SPOR networks that will integrate either infection control, response to threats, vaccines, or diagnostics;
- ✳ Embed training in all our strategic initiatives.

### **Priority 2: Integrating Infection and Immunity Knowledge in the Control and Prevention of Chronic Disease.**

Chronic diseases present a significant challenge to the health care system in Canada, as patients require long-term treatment and care. Additionally, as patients are living longer, new associated conditions are arising which need to be addressed. The selected sub-topics for this priority will allow III to build on previous successes, take advantage of dedicated research programs and fully participate in signature initiatives. It is anticipated that these sub-topics can be easily integrated within signature initiatives as they are developed. These sub-topics are inflammation, human microbiome; transplantation, human immunology and immunotherapy, environment and health, and chronic viral infections including HIV/AIDS and hepatitis C.

#### **Sub-Topics for Priority 2: Integrating Infection and Immunity Knowledge in the Control and Prevention of Chronic Disease**

- ✳ Inflammation;
- ✳ Human microbiome;
- ✳ Transplantation;
- ✳ Human immunology and immunotherapy;
- ✳ Environment and health;
- ✳ Chronic viral infections including HIV/AIDS and hepatitis C.

The Institute supports research in chronic diseases of either infectious or immune etiology. There is a

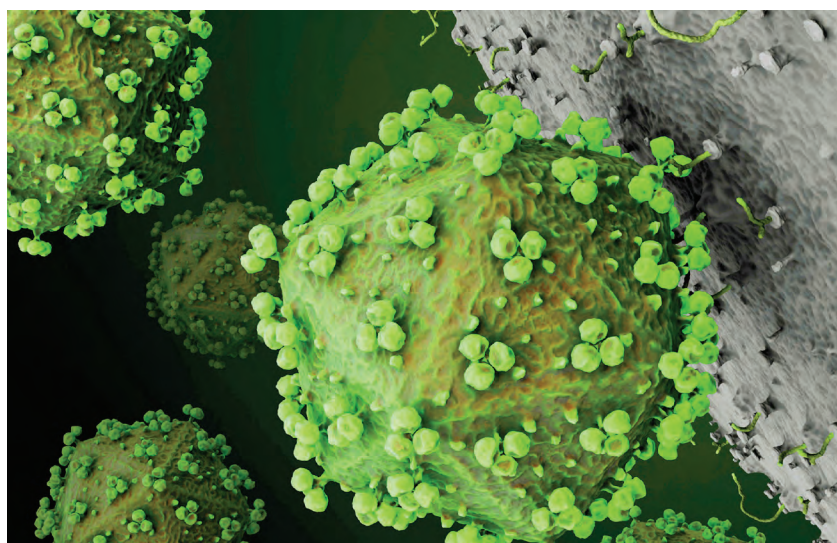


growing appreciation of the interaction between microbes and our immune system, which alters immunity. In doing so, microbes alter the onset of disease, the progression of disease and the extent of injury through the control of inflammation. The implementation of CIHR signature initiatives presents a unique opportunity for the III research community. Specifically, the Inflammation in Chronic Disease signature initiative is relevant to the III mandate. The Institute of Musculoskeletal Health and Arthritis and III are co-leads on the development and management of this large scale, multidisciplinary initiative. It is likely that there are many underlying commonalities among health conditions mediated by chronic inflammation and that a combined effort across individual diseases and conditions could accelerate understanding of these common principles leading to interventions to improve clinical outcomes. The Inflammation in Chronic Disease signature initiative will build research capacity, engage new investigators, support training and stimulate team collaboration in a trans-disciplinary group effort for research outcomes to be realized more rapidly. III will bring together adequately resourced teams to integrate knowledge from immunity and infection research which will be applied to promote the health of Canadians. This will generate new approaches to attenuate inflammation, identify strategies for tissue regeneration and repair of damaged organs, alter the long term damaging effects of chronic viral infections and lead to new forms of immunotherapeutics. Because of the strong links to inflammation, the Institute's transplantation and human microbiome initiatives are embedded within the Inflammation signature initiative.

The Institute will invest considerably in the years to come in the Personalized Medicine signature

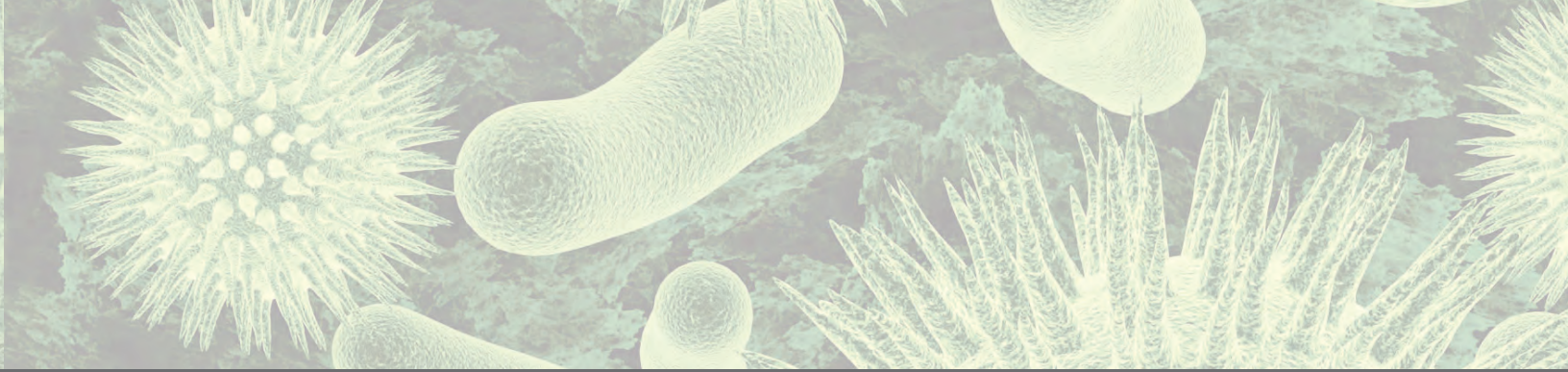
initiative, and will co-lead a new signature initiative on environments and health. These activities should facilitate the integration of I&I knowledge in the control and prevention of chronic diseases. Many infections in Canada now lead to chronic diseases and III will continue to manage proactively specific funding envelopes devoted to HIV/AIDS and hepatitis C. When appropriate, research dealing with chronic viral infections will also be embedded in the Inflammation and Chronic Disease signature initiative.

The Institute is providing leadership to the HIV/AIDS Research Initiative. The I&I community in Canada has benefited from several research programs launched by the HIV/AIDS Initiative. For example, the Initiative has paved the way and shown organizational leadership in community-based research. The Initiative is contributing to several signature initiatives including Personalized Medicine, Inflammation in Chronic Disease, and Community-Based Primary Health Care.



*HIV virus*



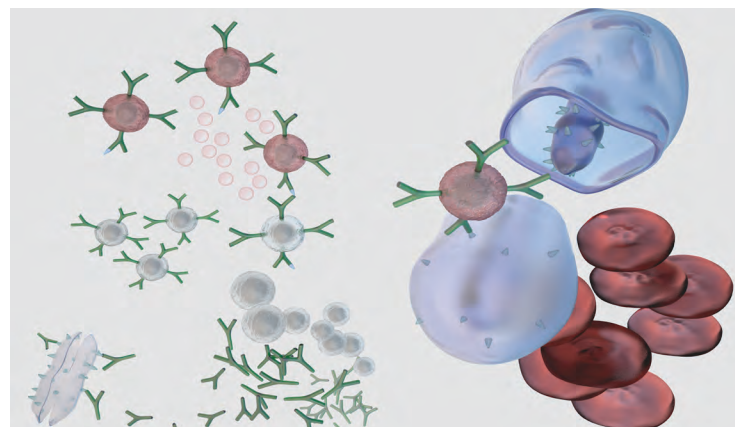


### **Core actions for Priority 2: Integrating Infection and Immunity Knowledge in the Control and Prevention of Chronic Disease**

- ✦ Support the Inflammation in Chronic Disease Initiative while embedding the Transplantation and Human Microbiome Initiative;
- ✦ Contribute to the control and prevention of chronic diseases by supporting the signature initiative on Personalized Medicine and co-leading a potential new initiative on environments and health;
- ✦ Facilitate immunity knowledge translation in human immunology;
- ✦ Provide leadership for the HIV and hepatitis C research initiatives;
- ✦ Support the HIV Initiative investments in Roadmap signature initiatives and the creation of SPOR networks that will integrate infection and immunity knowledge in the control and prevention of chronic disease;
- ✦ Embed training in all strategic initiatives.

## **Objective 2: Facilitating the Application and Impact of Research**

To facilitate the real-world application of important health research findings in a timely and efficacious manner, an essential part of the CIHR mandate is the translation of new knowledge into more effective services and products for strengthening Canadian health care system. This enables the application of research outcomes and innovations to the development of new tools, technologies and interventions that will improve the health and quality of life of Canadians. III will emphasize translational activities to improve health outcomes and commercial success in its two priority areas: preparing for and responding to emerging threats and alleviating the burden of chronic diseases. Transferring innovations from the laboratory bench to applications and commercialization is now a major thrust in research. III and other CIHR Institutes are uniquely positioned to catalyze health innovations and facilitate public and private sector partnerships.



*Immune response*



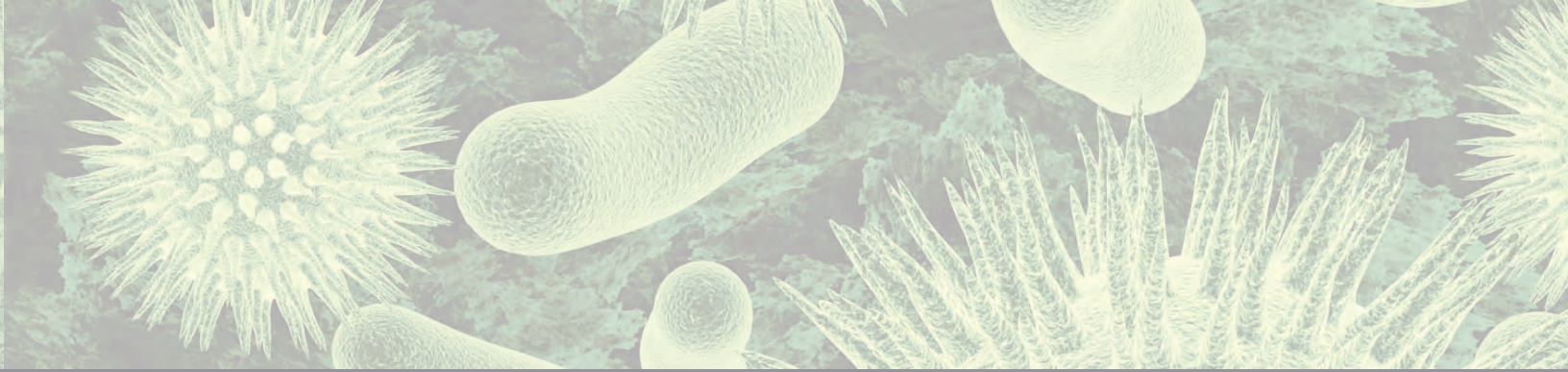
## Priority 1: Promote Innovation

The Institute will lead in the development of new strategic research initiatives addressing specific health challenges in either preparing for or responding to existing and emerging threats or in reducing the burden of chronic diseases of an immune or infectious nature. We will use innovative tools and programs to facilitate work for the generation of new therapies, products, health systems or interventions that will improve the health of Canadians. The Institute will continue to support networking and collaborative activities among III-funded researchers to promote cross-fertilization of ideas, knowledge exchange and the development of synergy among funded teams working in different, but complementary, research fields. The Institute has discovered, from past experience that such opportunities can be particularly rewarding in the early stages of large-scale initiatives supporting multiple teams. The impact of multidisciplinary teams will be further enhanced by our strategy of bringing these teams together during the course of the initiative to increase communication and exchanges, which should facilitate synergy across the four health research themes. Strategies are already in place within the Inflammation signature initiative to build teams encompassing the four research themes. The Institute has many potential opportunities for international efforts in all research priorities. The prioritization of these international efforts will allow the leveraging of our investment in helping our community to be part of international multidisciplinary teams. Finally, the Institute plays a proactive role in a federal action plan for research, innovation and commercialization agenda for vaccines.

### Core actions for Priority 1: Promote Innovation

- ✦ Support networking and collaborative activities among III-funded researchers of all pillars to promote cross-fertilization of ideas, knowledge exchange and the development of synergy among funded teams working in different, but complementary, research fields such as microbiome, transplantation, inflammation and personalized medicine;
- ✦ Identify and act on areas in which the III can take a catalyst role to support projects nationally and internationally (e.g. antibiotic resistance, vaccines, microbiome, HIV cure);
- ✦ Initiate the design of funding opportunities on surveillance, socio-economic modeling and cost effectiveness in our priority fields including in vaccine evaluation.



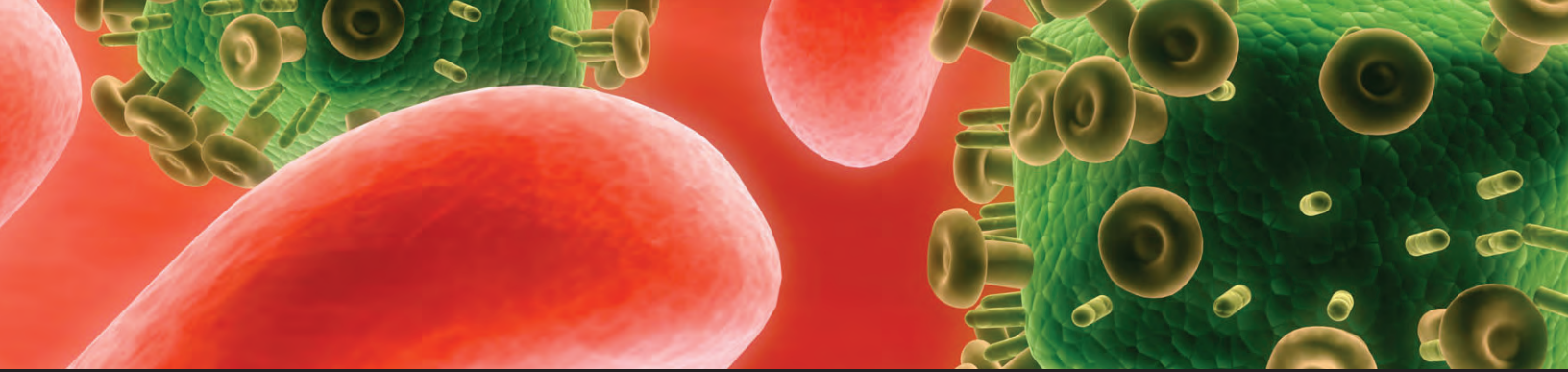


## Priority 2: Facilitate Impact of Research Outcomes

In collaboration with partners, and working closely with the CIHR Evaluation Branch, III will continue to monitor and evaluate the outcomes of previous III strategic research investments and will provide support for knowledge translation activities both during and following the granting period. The Institute will collate research outcomes from progress and end-of-grant reports, supported by personal interviews when indicated, and will help to enable researchers' translational activities through knowledge translation and commercialization workshops. The Institute will build on the success of previous strategic investments to sustain the momentum generated, expand the research scope, and engage the appropriate end-user communities, including the private sector who can bring their products and technologies to the clinic or marketplace. Initiatives, within the priority research areas, will be developed with clear, concise and measurable goals and objectives and a comprehensive evaluation plan. All these measures will address recommendations in the 2011 International Review for an enhanced strategy for measuring research outcomes and a greater focus on realizing the commercial potential of research discoveries. The Institute produces annual reports to Governing Council where progress on core actions is monitored and, if warranted, where corrections can be made to meet the specific objectives of our strategic plan.

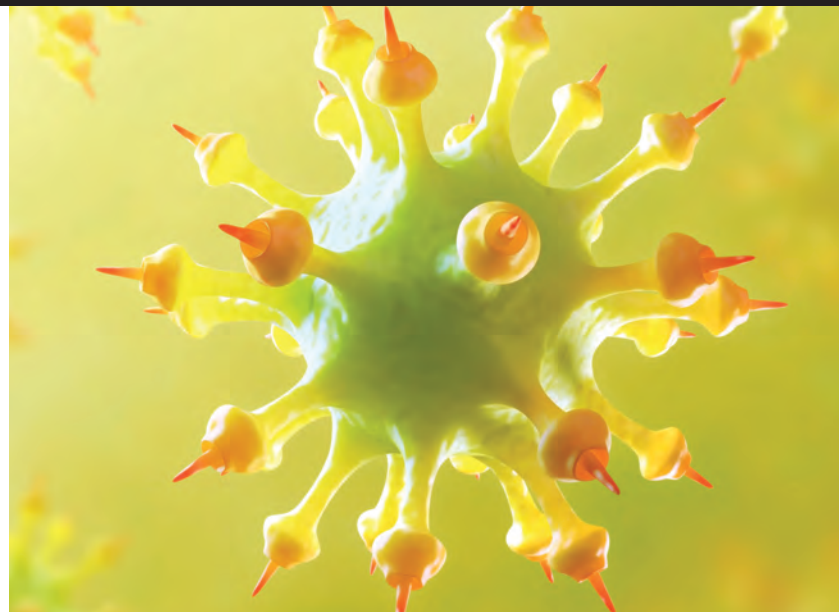
## Core actions for Priority 2: Facilitate Impact of Research Outcomes

- ✳ Monitor and evaluate outcomes of previous III strategic research investments in clinical autoimmunity and alternatives to antimicrobials in collaboration with partners, and working closely with the CIHR Evaluation and Analysis Branch;
- ✳ Develop clear, concise and measurable goals and objectives and a comprehensive evaluation plan for all newly developed initiatives including microbiome, transplantation, inflammation, vaccines, and antibiotic resistance;
- ✳ Assist researchers in translational activities through knowledge translation and commercialization workshops in the field of new therapies, microbiome and vaccines;
- ✳ Engage the appropriate end-user communities, including the private sector who can bring their products and technologies to the clinic or marketplace;
- ✳ Write annual progress reports to monitor advancement on core actions and take action if necessary.

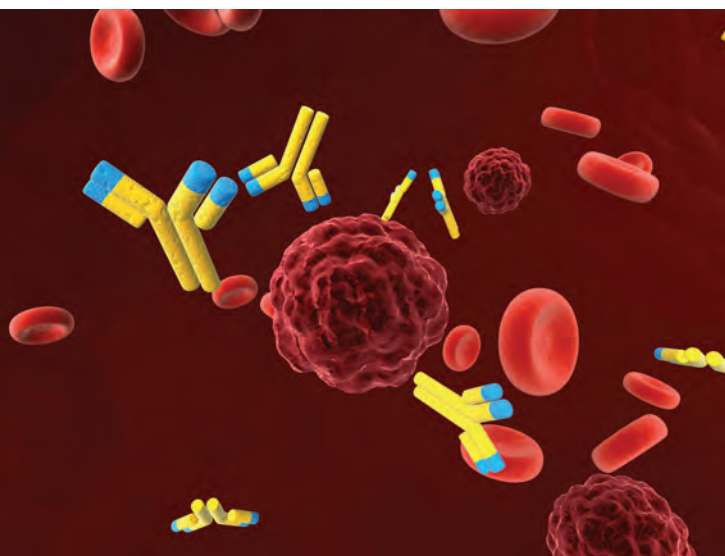


## CONCLUSION

The societal relevance of Infection and Immunity research to health is greater than ever. The first decade of existence for III has been rich with many research successes and outcomes. The goal of this revised strategic plan is to catalyze research directions that will leverage the investment in investigator-driven research programs and that will have tangible health impacts and economic benefits. This will be possible because of the formidable complement of research excellence in the field of I&I in Canada.



*Influenza virus*



*Antibody-mediated immune response*

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For more information or to find out more about CIHR Institute of Infection and Immunity, please go to <http://www.cihr-irsc.gc.ca/e/13533.html>