Infection and Immunity Research in Canada – Ensuring Impact

Report from a Workshop: Charting a Course for Knowledge Translation

Lord Elgin Hotel
Ottawa, Ontario
September 24 & 25, 2008

Workshop planned and hosted by:

CIHR – Institute of Infection and Immunity whose mandate is

"to develop and coordinate infection and immunity research on behalf of CIHR and ensure that research results are translated and applied to improving the health and quality of life of Canadians".

October 2008

Workshop Highlights

Approximately 40 individuals participated in a workshop in Ottawa September 24 and 25, 2008 to help the CIHR Institute of Infection and Immunity lay a foundation through which to proactively address its Knowledge Translation (KT) mandate. Participants included researchers from various disciplines; representatives from organizations that use research knowledge and individuals with expertise in KT (including from CIHR KT Portfolio) in addition to Institute Advisory Board Members and staff. Deliberations were informed by a background document titled *A Framework for Doing Knowledge Translation in Infection and Immunity Research and a Report of Survey Results* reflecting input of a convenience sample of III stakeholders.

Through discussion there were ultimately four priority areas that were identified as needing attention and focus in order to move the KT agenda of the Institute forward. Those four priority areas and examples of key actions proposed for each area are described briefly below.

- **Facilitation and brokering** There was the clear sense of a need for intermediaries (people or processes) to link researchers with various user audiences. There is a broad range of stakeholders that must be involved for knowledge to be effectively used for societal benefit. There were three main areas in which action was recommended: collaboration with organizations involved in using knowledge; enhanced use of modern information technology, and refinement of CIHR policies and practices to enhance knowledge translation.

- **Capacity building** There were several areas that were seen to influence the ability of the research and research user communities to do knowledge translation. This included information and knowledge resources (such as systematic reviews of KT approaches), knowledge and skills of researchers, and infrastructure (such as access to high-throughput screening for drug discovery). The actions identified were related to the development or identification of resources that enable KT; increasing 'people' capacity to do KT (e.g. training); and increasing KT knowledge and skills among researchers.

- **Evaluation and dissemination of lessons learned** A critical approach to planning and evaluating knowledge translation while doing it was an underlying theme. Examples of actions suggested include locating or commissioning systematic reviews of the effectiveness of KT approaches, critical review of knowledge gained through research funded through CIHR operating grants and seeking results of evaluation of Networks of Centres of Excellence and other agency funding programs with respect to successful KT.

- **Facilitation of translational research (bench to bedside)** Because the majority of researchers involved with the Institute are biomedical researchers, the component of KT that deals with the transition from biomedical research to clinical application is particularly important. Enhanced access to infrastructure that enables translational research (e.g. medicinal chemistry screening capacity, informatics) and increased opportunity for interdisciplinary research are examples of directions suggested.

Table of Contents

Workshop Highlights 2

Table of Contents 3

Background: 4

Objectives of the Workshop: 5

Setting the Stage: 5

Priorities for Knowledge Translation: 6

- Facilitation and Brokering 7
- Capacity Building 8
- Evaluation and Dissemination of Lessons Learned 8
- Facilitation of Translation Research (Bench to bedside) 8

A Proposed Action Plan: 8

- Priority for Action: Facilitation and Brokering 9
- Priority for Action: Capacity Building 11
- Priority for Action: Evaluation and Dissemination of Lessons Learned 13
- Priority for Action: Facilitation of Translational Research 13

Addressing the Framework: 14

Final Reflections: 16

Next Steps: 17

- Appendix 1: List of Workshop Participants 18
- Appendix 2: List of potential priorities identified in first round of discussions 20
- Appendix 3: A Framework for Doing Knowledge Translation in Infection and Immunity (Executive Summary) 21
- Appendix 4: Presentations: Mark Bisby, Bhagirath Singh and Ian Graham 22

Background:

Following the International Review of CIHR[1], and in anticipation of entering the next phase of the Institute's leadership, the Institute of Infection and Immunity (III) held a workshop of key stakeholders to help chart a course for the future with respect to knowledge translation (KT). The Institute has responded proactively to public health challenges arising in the first years of its existence and the International Review noted that the III has had some notable accomplishments in KT (e.g. responding rapidly to public health issues).

In the current Strategic Plan of III, one of five strategic goals was identified as:

> *"Encourage and facilitate knowledge translation in all fields and sectors related to the Institute mandate"[2].*

The **values** that guide Institute decisions, strategies and actions are excellence, innovation, collaboration, transparency and accountability.

The III recognizes that most of the research in infection and immunity done in Canada is not directly linked with the activities of the Institute. Nevertheless, there is potential for this large body of research to contribute directly and indirectly to a range of benefits for Canada and the health of its citizens. The Institute wishes to be more focused and proactive with respect to KT and therefore this workshop was held to further understanding of how these benefits could be realized to an even higher degree than they are at present, and how the Institute could assist with this process.

Approximately 40 individuals participated in the workshop that was planned and supported by III. Participants included researchers from various disciplines and various roles; representatives from organizations that use research knowledge and individuals with expertise in KT (including from CIHR KT Portfolio) in addition to Institute Advisory Board Members and staff. Deliberations during the workshop were informed by a *Report of Survey Results* reflecting input of a sample of III stakeholders (researchers, research users and other interested parties) and by a background document titled *A Framework for Doing Knowledge Translation in Infection and Immunity Research.*[3]

The purpose of this workshop was to lay a foundation through which the Institute of Infection and Immunity could address its KT mandate proactively. Given the challenges that this Institute has been faced with since inception (e.g. SARS, HIV/AIDS, contaminated water), and the compelling pressure to respond in a way that would make a difference for the health of Canadians, this Institute is in a particularly good position to do foundational work in KT that may be of benefit to other Institutes and CIHR as a whole.

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[1] The report of the International Board of review can be found at http://www.cihr-irsc.gc.ca/e/31464.html

[2] The full Strategic Plan can be found at http://www.cihr-irsc.gc.ca/e/35188.html In addition to the strategic goals identified, the Institute also identified five priority health areas in which to focus: Emerging infections and microbial resistance; Immunotherapy; Pandemic Influenza Preparedness; Vaccines of the 21st Century; HIV/AIDS.

[3] Both of these documents are available on the Institute website at http://www.cihr.gc.ca/iii.html

Objectives of the Workshop:

1. To recommend key priorities for the next 3 years to help stimulate, facilitate and support efforts to ensure that research done in infection and immunity results in positive benefit for Canadians and Canada.

2. To recommend key actions through which III, working alone or in collaboration with others, should address the priorities.

3. To consider and suggest refinements to a framework for planning, doing and evaluating KT within the community of infection and immunity researchers.

Setting the Stage:

Three speakers provided comments to stimulate discussion and set the stage so that participants were aware of key directions and mandates of the Institute of Infection and Immunity and of the KT Portfolio of CIHR. The presentations are included in Appendix 4.

Mark Bisby, former Vice President of CIHR and with a biomedical background, opened the workshop with some observations about how science and societal expectations have changed in the past decade. This notion was perhaps best captured when he compared directly two statements from federal budgets. In 1998, the wording used in the Canadian federal budget documents to justify an increase in the MRC (the pre-cursor organization of CIHR) budget was:

> *"to provide research grants, scholarships and fellowships for advanced research and graduate students"*

By 2008, this had become:

"The granting councils will…. partner with public and private stakeholders to ensure that practical solutions are found. CIHR will be provided with (an additional) $34 million per year for research that addresses the health priorities of Canadians, including the health needs of northern communities, health problems associated with environmental conditions and food and drug safety".

Bhagirath Singh, Scientific Director of the Institute of Infection and Immunity provided an overview of the mandate, strategic priorities and directions of the Institute. In addition, he reminded participants of the lengthy and complex nature of the process from discovery to effective application in the real world. He quoted an article published in Science in 2008[4] that provided data showing the median time from the earliest journal publication or patent to the time of a highly cited clinical study (a proxy for uptake and use of the information). This article cited median times for translation as described above as 16.5 years for an intervention that was not refuted in any way.

[4] Contopoulos-Ioannidis et al, *Life Cycle of Translational Research for Medical Interventions,* Vol 321, 5-6.

Ian Graham, Vice President of Knowledge Translation at CIHR, provided an overview of the KT mandate and strategic directions within his portfolio. He emphasized that KT is not optional for CIHR as it is enshrined in the legislation that created CIHR. He reviewed relevant sections of the legislation and provided key perspectives on how CIHR views KT. KT is seen to consist of four key components: knowledge synthesis, dissemination, exchange, and ethically sound application. CIHR is focusing its KT activities through two general categories: end-of-grant KT; and integrated KT. End-of-grant KT refers to the dissemination and communication activities undertaken by researchers once they have research findings appropriate for dissemination. Integrated KT is defined as a research approach that engages potential knowledge-users as partners in the research process in a collaborative or participatory manner that is usually solution-focused. One important conceptual tool that is used for understanding KT is the “Knowledge to Action Cycle” that can be used to think through KT in many different contexts, including commercialization (a form of KT).

The KT portfolio is currently working on many resources and processes designed to enhance KT within the CIHR community. Current strategic priorities and actions were summarized and a list of current activities provided. This includes a wide range of things such as:

- A KT guide for researchers and for peer/merit reviewers that is specific to CIHR themes/pillars
- Developing a citizen engagement framework
- Piloting a research reporting system (end of grant reports)
- Developing evaluation tools to assess the impact/success of partnerships
- Fine tuning a research impact and evaluation framework
- Promoting grants (Meeting, Planning and Dissemination) that enable end of grant KT
- Implementing the Open Access policy
- Developing an RCT results reporting policy

Priorities for Knowledge Translation:

Identifying priorities for knowledge translation within a large area such as infection and immunity is a significant challenge; the community of researchers, and those who work with research knowledge in various settings, is large and diverse. The group discussed dimensions to consider during the process of identifying where efforts should be focused. These dimensions that could ultimately influence the specific areas in which to focus included:

- The type of research evidence available
- Presence and role of partners
- Ability of potential users to respond to research knowledge, and their specific needs for new knowledge
- Health challenge or crisis that requires response and reaction from the research community
- Availability of infrastructure to enable change (increased use of research knowledge)
- End of grant reporting mechanisms

- Identification of actors and resources
- Cross training efforts
- Reactive and proactive elements
- Knowledge about gaps between "what is known" and "what is done", where high impact is possible
- Evaluation of KT outcomes

With respect to priorities for attention, a lengthy list of priorities was identified. Through discussion and expression of support by individuals present, seven of the priorities from the longer list were identified as most important and through the course of the day the top priorities were collapsed into four larger categories which are described below. The longer and more detailed list is included in Appendix 2 for reference purposes.

The top seven priorities for III originally identified were:

1. Act as a knowledge broker between researchers and various relevant target audiences.
2. Enhance infrastructure to support KT across the spectrum of research and application.
3. Increase the capacity for researchers to do KT through focus on trainees and KT training components.
4. Invest in methods to evaluate KT
5. Facilitate translational research (bench to bedside).
6. Close loops on programs already funded; i.e. what did we learn from a strategic RFA? What new knowledge or research related outputs emerged from a strategic initiative?
7. Develop and institute a process involving a broad range of stakeholders (researchers, end users, intermediaries) to set priorities for knowledge translation in infection and immunity.

Through further discussion, these priorities were collapsed into four categories that incorporated the aspects above:

- Facilitation and brokering
- Capacity building
- Evaluation and dissemination of lessons learned
- Facilitation of translational research (bench to bedside)

Facilitation and Brokering

There was the clear sense of a need for intermediaries (people or processes) to link researchers with various user audiences. It was acknowledged that there is a broad range of stakeholders (researchers, end users, intermediaries including health professionals and industry) that must be involved for knowledge to be effectively used for societal benefit. Stakeholder input across the range of research activity is important including the setting of priorities for knowledge translation in infection and immunity.

Capacity Building

There were several areas that were seen to influence the ability of the research and research user communities to do knowledge translation. This included information and knowledge resources (such as systematic reviews of KT approaches), knowledge and skills of researchers and infrastructure (such as access to high-throughput screening for drug discovery).

Evaluation and Dissemination of Lessons Learned

A critical approach to planning and evaluating knowledge translation while doing it was an underlying theme. This included such things as considering KT theories and models, and the nature of research evidence before planning and implementing various strategies to support KT; evaluating KT strategies when implemented; and reporting on the success or failure of these strategies.

Facilitation of Translation Research (Bench to bedside)

Because the majority of researchers involved with the Institute of Infection and Immunity are biomedical researchers, the component of KT that deals with the transition from biomedical research to clinical application is particularly important. There were a couple of very specific areas identified that participants deemed essential in supporting more translational research e.g. development of specific technical and IT platforms and more opportunities to work across disciplinary boundaries.

A Proposed Action Plan:

There were many actions identified that addressed one or more of the priorities identified. To the extent feasible in a short period of time, participants identified the entity most likely to be in a position to address the action and also (if it wasn't the Institute of Infection and Immunity) what the role of the Institute should be. The proposed actions are identified in the tables below and are associated with the priority most closely aligned (although some addressed more than one priority). The actions identified have been organized into related themes in the tables below. The general themes under which specific actions have been identified have been suggested by the report writers. The specific suggestions underneath the categories were given by participants at the Workshop. Potential time horizons for each of the actions are suggested (short, medium and long term).

Priority for Action: Facilitation and Brokering

Action	Timeline (S)hort (M)edium (L)ong	Who?	Notes
Collaboration with Organizations Involved in Knowledge Use			
Establish Joint Venture with partners to enhance KT with a view to enhancing all partners' ability to contribute to KT (and not duplicating).	M-L	III and partners	This was envisioned as an ongoing resource and opportunity for knowledge exchange (as opposed, or perhaps in addition to, the 'Strategic initiative' approach that has characterized III partnerships to date, where activity was focused, intense and time limited toward a specific end. Various purposes for the Joint Venture were discussed, including setting of joint priorities with knowledge using organizations; provision of focused KT support for researchers (materials and processes).
Leverage not for profit disease charities with respect to their value to influence decision makers (including health system managers and politicians)	M	CIHR and III	This could include consideration of things such as identifying appropriate federal and provincial government agencies/committees to target; and/or advocacy for the creation of suitable mechanisms to help ensure KT.
Coordinate and collaborate to disseminate key messages from partner organizations (e.g. CATIE, Kidney Foundation, Canadian Diabetes Association)	S	III and partners	Many organizations exist at least partially for the purposes of knowledge brokering and effecting change in various audiences with respect to health issues. Build on this resource to share research results in infection and immunity.
Enhanced Use of Modern Information Technology			
Better web interface (Web 2.0) for public and other researcher access to research results as provided in end of grant reports and lay abstracts of current CIHR-funded research.	M	CIHR	Don't reinvent wheels. Include research results from organizations other than CIHR. (Collaboration with other health research funders)
Improve CIHR interface with various users using the web.	M	CIHR	Explore social networking models (Wikis, Facebook, Twitter, etc.). Offer enrolment site for CIHR-funded clinical trials.
Provide ongoing user friendly web receptacle with respect to ongoing initiatives and current research results.	M	III as lead for later cross-CIHR application	

Refinement of CIHR Policies and Practices to Enhance KT		The current status of these suggestions should be discussed with CIHR – KT Portfolio. They have many activities ‘in the works’.	
Include KT enabling funds in core operating grants.	S	CIHR	Expenses related to KT activities are currently allowable in operating grant proposals.
Have end of grant/initiatives meetings with partners to take stock and communicate results; plan actions.	S	III and researchers	To some extent, this is already enabled by existing mechanisms – end of grant supplements and the Meetings, Planning and Dissemination Program of CIHR.
Mining final end of grant reports to transform findings into useful pieces for target audiences.	S-M	CIHR	End of grant reports will be available soon. A plan should be developed in the short term to determine how final reports will be used and for what purpose. Will require significant investment by CIHR in knowledge brokers able to appreciate significance of findings reported.
Regularized notice of III when publications accepted so that III can be prepared for media enquiries and can leverage opportunities.	S	III as lead for later cross-CIHR application	Researchers would do this, but expectation would need to be created by III.

Priority for Action: Capacity Building

Action	Timeline Short Medium Long term	Who	Notes
Develop or identify resources that enable KT			
Host a KT Forum with III stakeholders that would build on documented successes and focus on developing materials and approaches in consultation with users.	S	III	
Create KT case studies that can be used as the basis for short courses for new investigators	S	III and KT Portfolio	If there were several modules (including case studies) available to assist researchers with thinking through KT, that would be helpful.
Locate, or commission if not available, systematic reviews of KT approaches including that of training approaches for trainees.	S	KT portfolio	The principle here was that KT efforts initiated should be done on the basis of evidence reflecting effective approaches. Cochrane Collaboration databases may be a good resource for this
Learn from others about successful KT practices; (CHSRF and Myth Busters); social marketing experts; locally targeted..	S	CIHR and III	"Think globally, act locally" applies strongly to KT
Increase 'People' Capacity to do KT			
More training opportunities in medicinal chemistry, medical statistics, health economics, and other disciplines and fields required for translational research	M-L	III and researchers	Senior researchers across Canada will have to be involved to realize this. III can advocate and influence (and possibly provide incentives).
Enable the training of trainees with respect to KT	S-M	CIHR	Through financial incentives (e.g. setting aside a KT trainee position in grants with a strong KT component)
Invest in training and funding of knowledge brokers in various settings.	S-M	III	Establish a KT position at III to help ensure researchers are aware of, and engage in KT opportunities where results warrant same. (Broker knowledge and opportunities internal to CIHR and its partners)
Work with knowledge user partners to improve their capacity to use research knowledge	M	III	e.g. Include knowledge users as part of the research team
Course buy out to enable KT at end of grant	M	CIHR	The availability of course release time would enable a researcher to focus on KT when results warrant dissemination and exchange.

Increase KT Knowledge and Skill Among Researchers			
Expand KT components in new investigators meeting held regularly	S	CIHR	
Increase expectations with respect to how investigators describe KT in each of their grants.	S	CIHR	CIHR – KT portfolio is developing templates for KT planning
Provide opportunities and incentives for more researchers to feel comfortable as communicators of their research field to the public	S-M	CIHR	

Priority for Action: Evaluation and Dissemination of Lessons Learned

Action	Timeline Short Medium Long term	Who	Notes
Locate, or commission if not available, systematic reviews of KT approaches invoked, including that of training approaches for trainees.	S	KT portfolio	It is important to do KT in ways that use research that informs the best way to do that.
Formal grant reporting and program evaluation	S-M	CIHR	Accountability for ensuring research results are used to contribute to positive outcomes is important.
Information from the body of final reports of research done on a particular topic should be a factor considered when determining strategic priorities for future RFAs.	M-L	III and CIHR	If critical review of a large number of final reports identifies knowledge and results available that should be applied, but aren't; this should influence strategic actions of the Institute with respect to KT.
Seek results of evaluation of NCEs and other agency funding programs with respect to success in KT (including commercialization goals).	M-L	CIHR	We should learn from other endeavours, including international examples, that have set out to do KT

Priority for Action: Facilitation of Translational Research

Action	Timeline Short Medium Long term	Who	Notes
Invest in infrastructure that is essential to enable translational research.	M-L	CIHR	Certain resources make translational research sustainable e.g. medicinal chemistry screening capacity; informatics.
Increase opportunities for interdisciplinary research.	S-M	CIHR and III	

In addition to the specific KT actions above, there were several suggested actions that related to communication and awareness activities that would help enable KT. That is, they may be helpful, but are not sufficient to ensure use of research results. Some of the suggestions along these lines included the creation of a 'Health Research Week' (as happens in Australia and Saskatchewan) and doing work to increase the public's support for health research. Greater effort and

success in translating the results of CIHR-funded research into improved health for Canadians should also have this effect.

Addressing the Framework:

A background document entitled "A Framework for Doing Knowledge Translation in Infection and Immunity Research" (Executive Summary is in Appendix 4 and the full report is available on the Institute website at www.cihr.gc.ca/iii.html) was provided as a "jumping off spot" for discussion at the workshop. The framework includes four components:

- A high level description of knowledge translation
- A description of outcomes (and related outputs) with which KT is concerned
- An overview of KT as viewed by CIHR (with commercialization viewed as a special case of KT)
- An eight-step process through which researchers think about and plan for knowledge translation as it relates to their own area of research.

Given the limited time for this discussion, participants were asked to comment on five focused questions. Their comments are summarized below.

Question 1: Is the high level description of KT helpful? (Section 3B) Why or why not? What would make it more helpful?

- The definition of knowledge translation elaborated in the paper is broad enough to provide a place for everyone from biomedical to community-based researchers.
- The term "health system" should be defined more widely than the Canadian health system and include impacts on global health.
- It is unclear who the target audience for this document is: III researchers, all CIHR researchers or a broader range. If III researchers are the target audience, the document should be tailored more to their interests and activities.
- There should be more emphasis on the end-users of research and the different audiences for KT.
- Figure 1: Knowledge Trajectory, Outputs and Outcomes, needs to be clarified. A figure that is less linear in presentation would be an improvement.

Question 2: Section IIIC talks about the outcomes anticipated as a result of KT. What indicators would you point to that would reflect knowledge translation is occurring in infection and immunity?

- Table 1: Preliminary Indicators of Health Research Impact should include measures of patient satisfaction/understanding under the heading Informed Decision-Making.
- How to measure outputs and outcomes is not clearly understood and which outcomes are relevant depends on context. More evaluation of KT effectiveness is needed as is more research on increasing knowledge uptake, for example, by changing physician behaviour.

- The number of decision support tools or guidelines informed by CIHR research is an important indicator.
- Popular dissemination through websites and other media is absent from Table 1.
- There is a need for CIHR to invest in a knowledge management system that is available to all.

Although not specifically addressing the question above, a suggestion was made for the addition of a diagram that differentiated KT and impact (i.e. knowledge translation is one process or activity that may lead to impact from research use).

Question 3: Are the sections that describe how KT (including commercialization) is viewed by CIHR clear? (Sections IIID and IIIE). What would make this section more helpful?

The view of commercialization expressed is simplistic and the concept of parallels and differences between commercialization and other forms of KT needs more development.

Question 4: Section IIIF describes an 8 step process for potential use by researchers in planning KT activities. Does this process make sense? Is it feasible? Why or why not?

- There needs to be a greater emphasis on different stakeholders and what their involvement should be at different points in the process.
- A step-wise process tends to linearize thinking about the process of KT. It is more circular and iterative. Novel perspectives brought to the KT process during the planning and conduct of research will influence and change how it is implemented, its effectiveness and utility.
- "Needs" trump "gaps". Filling gaps is meaningless in the absence of a need.
- Usefulness will depend on who applies it and for what purpose. Grant-writing? Grant reviewing? Will there be time, space and recognition for applying this process?
- The process should include (i) justification of KT, (ii) measuring of effectiveness of KT and (iii) what sort of KT is required.
- There is no mention of the role of media in the KT process.
- Feasibility hinges on respect and uptake of other researchers' outputs.
- To be used as a guideline for researchers, the Process for Planning KT Activities section needs to be shortened to one page or less.

Question 5: Are there any perspective or components missing from the Framework that are essential in order that this document is useful (and used) by the infection and immunity research community?

- Planning for KT needs to be sold as a positive activity that improves the significance, conduct and impact of research rather than another onerous application requirement. The document does not adequately address the motivation for moving in the direction of KT.
- There needs to be evidence-based KT. How do we find out what changes outcomes? What is the impact of current interventions? How do we measure impact?

- Training new investigators in KT is important to create a generational shift and to facilitate shift from mode 1 to mode 2 research.
- In general, the shift from mode 1 to mode 2 science and the enablers for this, e.g. team-building, was not sufficiently elaborated in the framework.
- There needs to be a greater focus on stakeholder involvement in research. There should be more emphasis on the differing perspectives of the various groups that use research.
- Lay reviewers should be included in review panels and their impact on the review process assessed.
- There should be more emphasis on the differing perspectives of groups that use research.
- Is there a role for CIHR as knowledge broker, or is that the responsibility of other organizations?
- End-of-grant reporting requirements must address ethical/privacy issues.
- There needs to be a place for reporting/sharing negative results to avoid needless repetition.
- The risks (e.g. inflated expectations) were not addressed.

Summary

Based on input during the discussion and the post-meeting assessment, the majority of participants judged the Framework paper to be moderately or very useful as a background document to stimulate discussion. One group commented positively on the broad definition of knowledge translation elaborated in the paper. Another found the concrete examples in the appendix useful.

During discussion, several references were made to the need for more emphasis in the Framework document on stakeholders and research users – their various perspectives, inputs and potential roles in both research and the KT process. The need for evidence-based KT and for evaluation of KT interventions and impacts were seen to require more elaboration. The importance of training in KT was not addressed. Finally, there was general agreement that, to be useful as a framework for KT for the research community, the document must be reduced in size. It was felt the contents could form the basis of a short guide for researchers planning KT activities.

Final Reflections:

Just prior to dispersing, workshop participants offered some reflections on the deliberations during the workshop. Key points that emerged follow.

Balance is required on several dimensions when thinking about KT in infection and immunity. There is a balance needed between efforts to identify and 'push' or promote the use of research knowledge and attending to the 'pull' from users with respect to what information they need to do their jobs. Both perspectives are needed and may not be related to the same research. There is also a balance of KT efforts needed with respect to when in the knowledge development trajectory KT is consciously addressed. In some cases, how the knowledge will eventually be used or translated should be considered in the very early stages of research; but this is not appropriate in every case.

Better articulation of roles in KT is needed. Perhaps this is a question of balance as well. Not all researchers should be expected to do KT, but some should (or in some situations, they should). However, KT requires specific skills and knowledge, and it may not be researchers who are best positioned to do KT. What are the respective roles of researchers, research institutions, CIHR, or organizations for whom use of research knowledge for the accomplishment of their own aims is a key part of what they do? The challenge is in arriving at an understanding of which individuals or organizations are best positioned to play what role in KT and under what circumstances.

Communication is necessary, but not sufficient for KT. Knowledge translation is a complex, multifaceted process involving many variables and influences.

Knowledge needs to be managed. Someone (or more likely some organization) needs to 'manage' research knowledge – to monitor its growth, to assess its potential and to enable knowledge to move and be shared in such a way as potential benefit is realized.

Given the high degree of translatability of infection and immunity research (e.g. immediate impacts on design and operation of public health surveillance systems), and its past successes, III has an opportunity to position itself as a leader/ test-bed among the Institutes in experimenting with and implementing cross-CIHR strategies and initiatives in KT in collaboration with KT portfolio.

Next Steps:

The discussion and debate throughout the workshop was spirited and thoughtful. Participants engaged energetically in the challenge of thinking through how best to support and make KT possible, given that it is a clear mandate of CIHR and there are specific expectations of important stakeholders such as the federal government, and increasingly of all Canadians.

With respect to the proposed actions, it was clear from input from the representatives from the KT portfolio that there is much action from that group that addresses some of the directions identified in the workshop. Determining with more certainty if current developments underway address the priority actions would be an important first step before proceeding.

This report will be circulated to participants in the workshop for their review and input. The Institute of Infection and Immunity will work in collaboration with the KT Portfolio to identify specific actions and directions through which to assertively address the KT priority identified in the Strategic Plan.

Appendix 1: List of Workshop Participants

Participant	***Title***	***Organisation***
Barreto, Luis	Vice President Public, Scientific and Medical Affairs	Sanofi Pasteur CIHR - III Advisory Board
Bilodeau, Marc	Associate Professor Medicine	Universite de Montreal
Bisby, Mark	Consultant	Formerly Vice-President, CIHR
Bray, Judy	Assistant Director Associate Director	CIHR – III CIHR - ICR
Brehaut, Jamie	Scientist Ottawa Health Research Institute	University of Ottawa
Dutz, Jan	Scientist Child and Family Research Institute	University of British Columbia
Flicker, Sarah	Assistant Professor Environmental Studies	York University
Graham, Ian	Vice President KT Portfolio	CIHR
Griffiths, Mansel	Director Canadian Research Institute for Food Safety	Guelph University
Guimond, Josee	Director Research Programs and Partnerships	Canadian Diabetes Association CIHR – III Advisory Board
Halperin, Scott	Professor Pediatrics and Microbiology & Immunology	Dalhousie University
Heathcote, Jenny	Head, Division Patient Based Clinical Research	Toronto Western Research Institute
Hill, Warren	Senior Research Analyst	BC Centre for Disease Control CIHR – III Advisory Board
Hosein, Sean	Science and Medicine Editor	Canadian AIDS Treatment Information Exchange, CHARAC
Jurkovic, Leah	KT Sector Specialist KT Portfolio	CIHR
Kubes, Paul	Director Calvin, Phoebe and Joan Snyder Institute of Infection, Immunity and Inflammation,	University of Calgary
MacDonald, John	Coordinator Inflammatory Bowel Disease Review Group Cochrane Collaboration	Robarts Research Institute
Magnan, Jacques	Interim President and CEO	Alberta Heritage Foundation for Medical Research
Malo, Gwen	Associate Strategic Initiatives	CIHR – III CIHR - ICR

Moor, Bruce	Assistant Director	CIHR – III
Nekka, Fahima	Quebec Scientific Director	MITACS (Mathematics of IT and Complex Systems)
Richardson, Carol	Manager External Relations, Strategic Initiatives and Evaluation	CIHR - III
Rogers, Tim	Director Knowledge Exchange	Canadian AIDS Treatment Information Exchange
Royce, Diana	Managing Director	AllerGen NCE
Singh, Bhagi	Scientific Director	CIHR - III
Sokol, Pam	Professor Microbiology and Infectious Diseases	University of Calgary
Spiegel, Jerry	Director, Global Health Liu Institute for Global Issues,	University of British Columbia
Tackaberry, Eileen	Research Manager Centre for Biologic Research	Health Canada
Tolomiczenko, George	Executive Director Research and Scientific Liaison	Crohn's and Colitis Research Foundation
Toth, Janie	Executive Director	PrioNet Canada (NCE)
Valvano, Miguel	Professor and Chair Microbiology and Immunology	University of Western Ontario
von Messling, Veronika	Researcher	Institut national de la recherche scientifique (INRS)
Wolfs, Wim	Director National Research Program	The Kidney Foundation of Canada
Wong, Tom	Director Community Acquired and Health Care Acquired Infections	Public Health Agency of Canada
Wright, Gerry	Director M. DeGroote Institute for Infectious Disease Research	McMaster University
Wu, Gill	Professor Kinesiology and Health Science and Biology	York University CIHR-III Advisory Board

Appendix 2: List of potential priorities identified in first round of discussions

1. Determine what knowledge is available and which addresses a gap between what is known and what is done.

2. Develop and institute a process involving a broad range of stakeholders (researchers, end users, intermediaries) to set priorities for knowledge translation in infection and immunity.

3. Invest in methods to evaluate KT

4. Act as a knowledge broker between researchers and various relevant target audiences.

5. Close loops on programs already funded; i.e. what did we learn from a strategic RFA? What new knowledge or research related outputs emerged from a strategic initiative?

6. Respond to challenges to the health of the Canadian public.

7. Target key audiences in a programmatic way (rather than episodic)

8. Increase the capacity for doing KT within trainees working and studying in infection and immunity.

9. Encourage interdisciplinary and inter - institutional collaboration.

10. Develop case studies that demonstrate successful KT within the fields of infection and immunity and share them widely. (One obvious example is community based research; the Institute already has a track record. Writing this up could provide a model for writing up other case studies).

11. Increase the prominence and importance of KT in ongoing programs. (Consider building on recent successes or current opportunities).

12. Document what KT successes have already happened.

13. Make it much easier to access reports or processes that synthesize results.

14. Facilitate translational research (bench to bedside).

15. Enhance infrastructure to support KT across the spectrum of research and application.

Appendix 3: A Framework for Doing Knowledge Translation in Infection and Immunity (Executive Summary)

The Canadian Institutes of Health Research's (CIHR) Institute of Infection and Immunity (III) is sponsoring a workshop to seek input to a plan through which the Institute can address its knowledge translation (KT) mandate proactively. This report is a background document intended to support workshop deliberations.

Both the CIHR and the III are mandated to engage in KT, which includes any activity that facilitates or increases the use of knowledge or the likelihood that it will be used in such a way as to facilitate progress toward health related outcomes of interest. CIHR describes two types of KT – integrated (i.e. occurs through the research process) and end-of-grant (i.e. occurs upon completion of the research project). The ultimate goal of either is to influence some setting within society where it could be useful in effecting change in health related outcomes.

The Knowledge to Action framework used by CIHR depicts the KT process. Categories from this framework were used to identify examples of KT from within the infection and immunity research communities to date. Examples of the following components were identified: integrated KT; knowledge synthesis, knowledge tools and products, problem identification, knowledge adaptation processes, assessment of barriers to KT selection; and tailoring of interventions and knowledge exchange opportunities.

A framework to assist in doing knowledge translation in the infection and immunity communities is proposed. The framework includes: a high level description of knowledge generation and KT in the specific context of infection and immunity research; a description of the outcomes (and related outputs) with which KT in infection and immunity research is concerned; an overview of KT as viewed by CIHR; commercialization as a special case of KT; and finally an eight step process through which researchers can think about and plan for knowledge translation as it relates to their own area of research.

There are four major entities involved in helping to ensure that infection and immunity research knowledge results in benefit to the health system and Canada. These are the communities of researchers themselves, the Institute of Infection and Immunity that provides strategic leadership in this area, the KT Portfolio of CIHR which assists with advancing KT across the full spectrum of health research and last, but not least, a wide ranging group of organizations across Canada that use research knowledge to advance their own objectives related to immune mediated and infectious diseases. All of these entities will be involved in the deliberations of the workshop to lay important foundations for enhanced KT in infection and immunity.

CIHR IRSC

Take-home Messages

- The social context of science is changing, probably faster than we realise. The ivory tower has fallen: "KT"* *is* an expectation of all health researchers.
- There is growing political and public dissatisfaction with the slim yields from biomedical research (compared to the ROI from more modest investments in health services or population health research)
- To counter this, we need ways to increase the throughput of translational research.

* or equivalent

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Appendix 4 – Mark Bisby's Presentation

CIHR IRSC

Types of Research Knowledge Production

Mode 1	Mode 2
• Traditional 20thC. way of knowledge production	• Knowledge produced in the context of application; problem-solving organised around a specific application
• Generated within a disciplinary context: the disciplinary department is the organizational structure	• Transdisciplinarity; the multidisciplinary network is the organizational structure
• Hegemony of the experimental, hypothesis-driven sciences	• Heterogeneity and organizational diversity
• Mode 1 problems are set and solved in a context governed by the, largely academic, interests of a specific research community	• Social accountability and reflexivity; research agenda set and modified by user participation: research framed in context of its impact on society
• Knowledge generators are separate from the communities who use their products and the spread of knowledge operates in a linear, sequential way	• Cooperation between knowledge generators and users in all phases of research
• Quality control through peer review and academic publication: excellence defined by disciplinary peers	• Quality Control: additionally by user assessment of the contribution the work has made to the overall solution of the problem
• Product is "reliable knowledge"	• Product is "socially robust knowledge"

From Gibbons, M. et al "*The new production of knowledge: the dynamics of science and research in contemporary societies*" ,Sage: 1994: Gibbons, M "Science's new social contract with society" Nature **402** Suppl. 2 December 1999

Canada

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Suppl. 2 December 1999

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Michael J Fox, speech to Bio2007

CIHR IRSC

- "A publish-or-perish system encourages exploring elegant questions whose answers are intellectually interesting, but often low-risk. It favors basic research over clinical, a far cry from the out-of-the-box flyers that are the hallmark of truly innovative results: translating discovery into new treatments"
- "American taxpayers are funding the greatest discovery engine in the world, yet we fail to provide incentives for our scientists to convert their relevant findings into improvements in human health."
- "Between government and commercial investments in medical research, we're talking a hundred billion dollars a year pumped into the drug discovery process. That is a boatload of money. Yet there is much talk about where to find more money for these endeavors… I'd argue that filling the unmet needs of patients across all diseases isn't about more money — it's about spending the money more effectively."

Canada

Budget 1998

In Canada…

In 1998, the wording used in the Canadian federal budget documents to justify an increase in the MRC budget was simply:
"to provide research grants, scholarships and fellowships for advanced research and graduate Students"

By 2008 this had become:
"The granting councils will … partner with public and private stakeholders to ensure that practical solutions are found. CIHR will be provided with an additional $34 million per year for research that addresses the health priorities of Canadians, including the health needs of northern communities, health problems associated with environmental conditions and food and drug safety"

Budget 2008 Responsible Leadership

Appendix 4 – Mark Bisby's Presentation

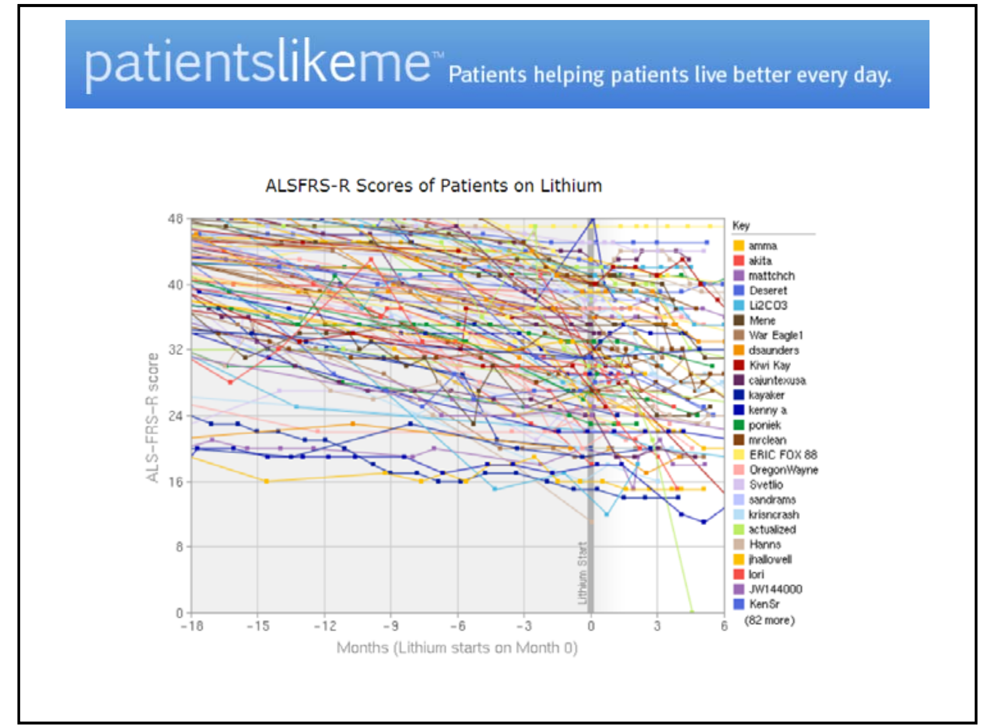
Science 2.0

"for Science 2.0 advocates, the real significance is the technologies' potential to move researchers away from an obsessive focus on priority and publication toward the kind of openness and community that were the supposed hallmarks of science in the first place.... When you do your work online, out in the open, you quickly find that you're not competing with other scientists anymore but cooperating with them" *Scientific American April, 2008*

"PatientsLikeMe is the leading online community for people with life-changing conditions. Patients embrace the open sharing of personal health data because they believe that information can change the course of their disease....With a focus on patients and research, our blog reflects knowledge resulting from the shared real-world experiences of our community. Welcome to the genesis of patient-led research."

"Science 2.0 will affect research funding, educational practices, and evaluation of research outcomes. Science funding agencies will face resistance as they promote a transformation that seeks to make a safe space for Science 2.0" *Schneiderman, B. Science 7 March 2008*

Canada



Appendix 4 – Mark Bisby's Presentation

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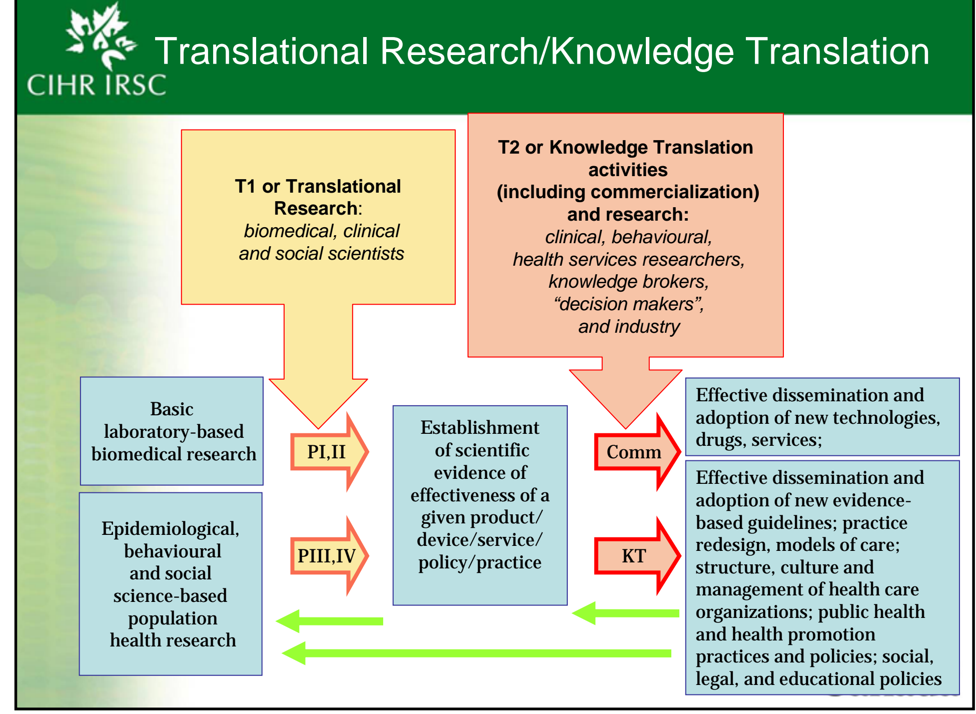

CIHR IRSC

T2 a better investment than T1?

"The 'bench-to-bedside' T1 enterprise occasionally yields breakthroughs that markedly improve the prognosis for a disease, but most new drugs and interventions produced by T1 only marginally improve efficacy. These incremental advances are certainly welcome, but patients might benefit even more—and more patients might benefit—if the health care system performed better in delivering existing treatments than in producing new ones."

The Meaning of Translational Research and Why It Matters Steven H. Woolf JAMA, (January 2008) Vol 299 p **211**

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Example: Antiplatelet Therapy to Prevent Recurrent Stroke

(from Woolf and Johnson, Ann. Fam. Med. 2005;3:545-552)

- In a population in which 100,000 people were destined to have strokes, 23,000 could be prevented if all eligible patients took aspirin.
- However, aspirin is given to only 58% of eligible patients, so only 13,340 strokes would be prevented.
- Opting to develop better drugs makes sense if the newer agents can lower stroke incidence by at least 40% (100,000 x 0.40 x 0.58 = 23,000), but this would require a proportional improvement over aspirin of 74% (1-(23,000/13,340)).
- The pharmaceutical industry developed alternative antiplatelet therapies: clopidogrel and ticlopidine underwent extensive testing in trials involving 23,000 subjects. However, these drugs were only 10% to 12% more effective than aspirin
- Is it better to spend a $ on biomedical research that is the first step in developing new drugs with marginal increases in effectiveness, or on health services research that aims to ensure that all who can benefit from existing drugs receive them?

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Appendix 4 – Mark Bisby's Presentation

CIHR IRSC

Ideas for improving the yield from basic research (1)

- Radical new research design and funding paradigms (e.g Myelin Foundation), embracing Science 2.0 concepts
- Support for systemic reviews of controversial areas, and meta-analyses in basic science…a basic-science Cochrane Collaboration
- More support for precompetitive research in the life sciences
- Requiring a knowledge translation plan in *all* grant applications (Who needs to know this? Have you taken their needs into account in designing the research? How will you ensure they will learn about the results?)
- New mechanisms to encourage tech transfer: harmonization of Canadian university IP rules, formation of IP pools and consortia (e.g. Aggregate Therapeutics). Support for innovative practices (e.g. reprofiling: Phoenix Biopharma Inc.). Allow funding agencies to gain ownership of IP generated with CIHR funds not exploited by university or creator within a reasonable period (march-in rights)
- Support for development of methods and tools to improve translational research e.g development of sensitive, reliable and cheap-to-obtain biomarkers that operate in animals and humans
- Open access to research resources funded by agencies
- Improve quality of research (statistical analysis) and root out questionable practices to improve reliability of biomedical research

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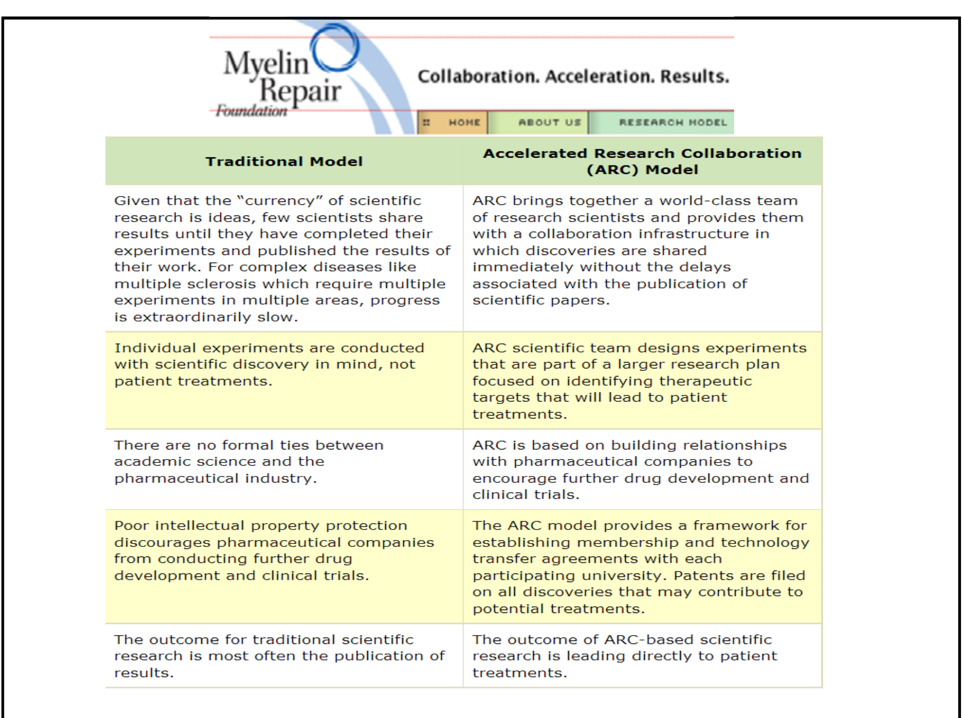

Traditional Model	Accelerated Research Collaboration (ARC) Model
Given that the "currency" of scientific research is ideas, few scientists share results until they have completed their experiments and published the results of their work. For complex diseases like multiple sclerosis which require multiple experiments in multiple areas, progress is extraordinarily slow.	ARC brings together a world-class team of research scientists and provides them with a collaboration infrastructure in which discoveries are shared immediately without the delays associated with the publication of scientific papers.
Individual experiments are conducted with scientific discovery in mind, not patient treatments.	ARC scientific team designs experiments that are part of a larger research plan focused on identifying therapeutic targets that will lead to patient treatments.
There are no formal ties between academic science and the pharmaceutical industry.	ARC is based on building relationships with pharmaceutical companies to encourage further drug development and clinical trials.
Poor intellectual property protection discourages pharmaceutical companies from conducting further drug development and clinical trials.	The ARC model provides a framework for establishing membership and technology transfer agreements with each participating university. Patents are filed on all discoveries that may contribute to potential treatments.
The outcome for traditional scientific research is most often the publication of results.	The outcome of ARC-based scientific research is leading directly to patient treatments.

Appendix 4 – Mark Bisby's Presentation

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Patent system 'stifling science'

OTTAWA – (9 September 2008) The world's intellectual property system is broken. It's stopping lifesaving technologies from reaching the people who need them most in developed and developing countries, according to the authors of a report released in Ottawa today by an international coalition of experts.

"The end of our old way of doing business does not mean we don't need a system for protecting intellectual knowledge," Gold said. "We need an IP system that will support collaborations among researchers and partners in industry and academia worldwide so that knowledge gets to those who need it most. This means the laws may have to be changed, but more importantly, it means that we have a lot of work to do to change behaviors and build trust among all the players."

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Appendix 4 – Mark Bisby's Presentation

CIHR IRSC

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CIHR IRSC

Why Most Published Research Findings Are False

John P. A. Ioannidis PLoS Med 2(8): e124 (2005)

- The smaller the studies conducted in a scientific field, the less likely the research findings are to be true.
- The smaller the effect sizes in a scientific field, the less likely the research findings are to be true.
- The greater the number and the lesser the selection of tested relationships in a scientific field, the less likely the research findings are to be true
- The greater the flexibility in designs, definitions, outcomes, and analytical modes in a scientific field, the less likely the research findings are to be true
- The greater the financial and other interests and prejudices in a scientific field, the less likely the research findings are to be true
- The hotter a scientific field (with more scientific teams involved), the less likely the research findings are to be true

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Appendix 4 – Mark Bisby's Presentation

Ideas for improving the yield from basic research (2)

Training

- Training awards focused on team-based interdisciplinary research experience
- Increased investment in training of clinical researchers and translational research assistants
- Training of existing researchers in the tools of translational medicine (e.g. improved statistical methodologies, novel clinical trial designs for early trials in human)
- **Communication/Interaction**
- Clearer writing and communications generally for non-peer audience (including dissemination if end of project reports)
- Opportunities for researcher-clinician-policy maker-public engagement
- Open access publication
- More industry/government researcher interchanges with academic researchers
- EXTRA-type program for engaging managers and financiers in experience of research

Canada

Training

"We cannot continue to train graduate students in isolation within single disciplines, nor can we ask any one individual to learn all the essentials of biology, engineering, and mathematics. We must transform how students are trained and incorporate how real-world research and development are done—in diverse, interdisciplinary teams. Our fundamental vision is to create an innovative paradigm for graduate research and training … that is more diverse and that embraces and actively pursues a truly interdisciplinary, team-based approach to research based on a known benefit and mutual respect."

J. D. Humphrey et al, *A new paradigm for graduate research and training in the biomedical sciences and engineering,* Advan. Physiol. Edu. 29: 98-102, 2005

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Appendix 4 – Mark Bisby's Presentation

Why doctors don't read research papers: Scientific papers are not written to disseminate information

"The reader-deterring style in which most scientific papers are written has evolved because they are written not to be read but to be published: another paper means another line on a curriculum vitae, another step towards a job or a research grant"

Michael O'Donnell BMJ 330:256 (2005)

"It is necessary for … the wider academic community to think more expansively about the context and meaning of dissemination for all university research. We are focused on the 'high-impact' journals, the 'important' conference and the 'significant' keynote speech.
The core issue masked by such language is clear: do we want to influence academics like us, or is there value in testing, extending and transgressing the limits of our professional identity, taking risks and speaking and writing with, to and for people who do not attend the same seminars, read the same books or monitor the same Google Alerts?"

Tara Brabazon, THES, 18 September 2008

Ideas for improving the yield from basic research (2)

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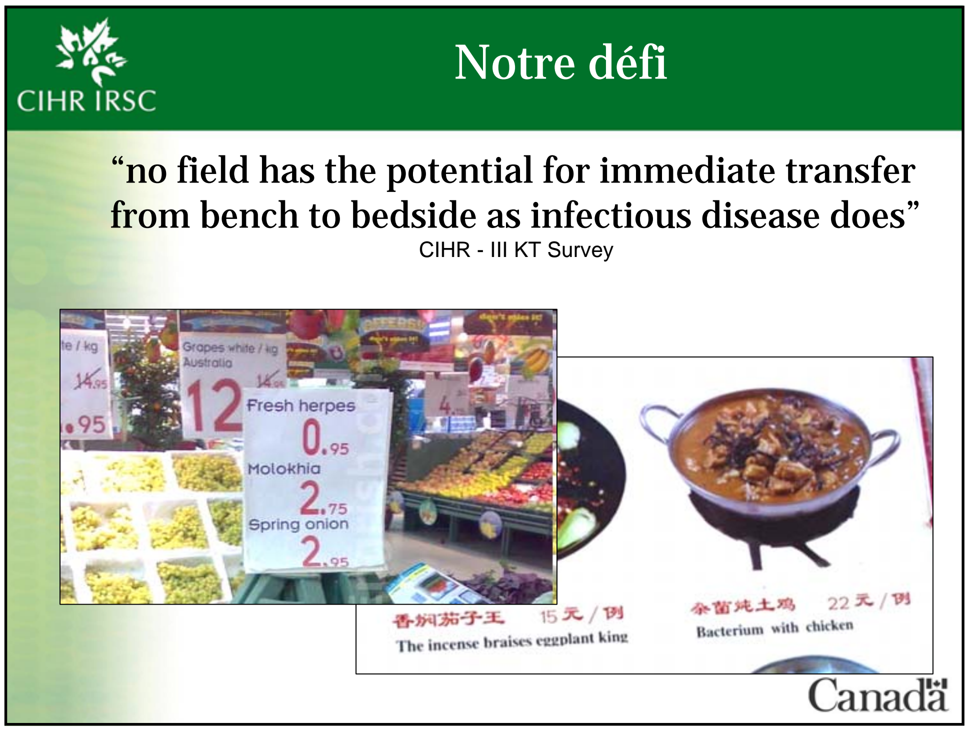

Appendix 4 – Bhagirath Singh's Presentation

Infection and Immunity Research in Canada

Ensuring Impact

Workshop to Chart a Course for Knowledge Translation

Ottawa
September 24-25, 2008

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Canadian Institutes of Health Research

CIHR is Canada's health research funding agency with an annual budget of $820 million

CIHR Mandate

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.**

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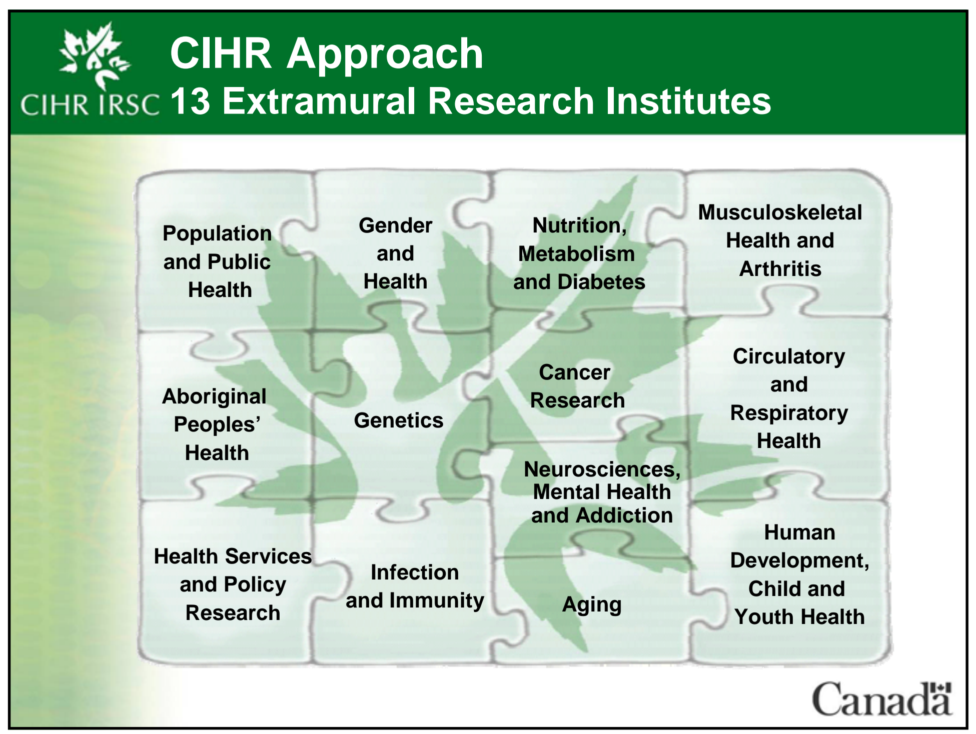

Institute of Infection and Immunity

III Mandate

To develop and coordinate infection and immunity research on behalf of CIHR and ensure that research results are translated and applied to improving the health and quality of life of Canadians.

The **mission** of the Institute is to provide national leadership, priorities and programs that promote novel infection and immunity research.

The **vision** of the Institute is to be an internationally-recognized innovator in support of infection and immunity research and a catalyst for the translation of new knowledge for global impact.

The **values** that guide Institute decisions, strategies and actions are excellence, innovation, collaboration, transparency and accountability.

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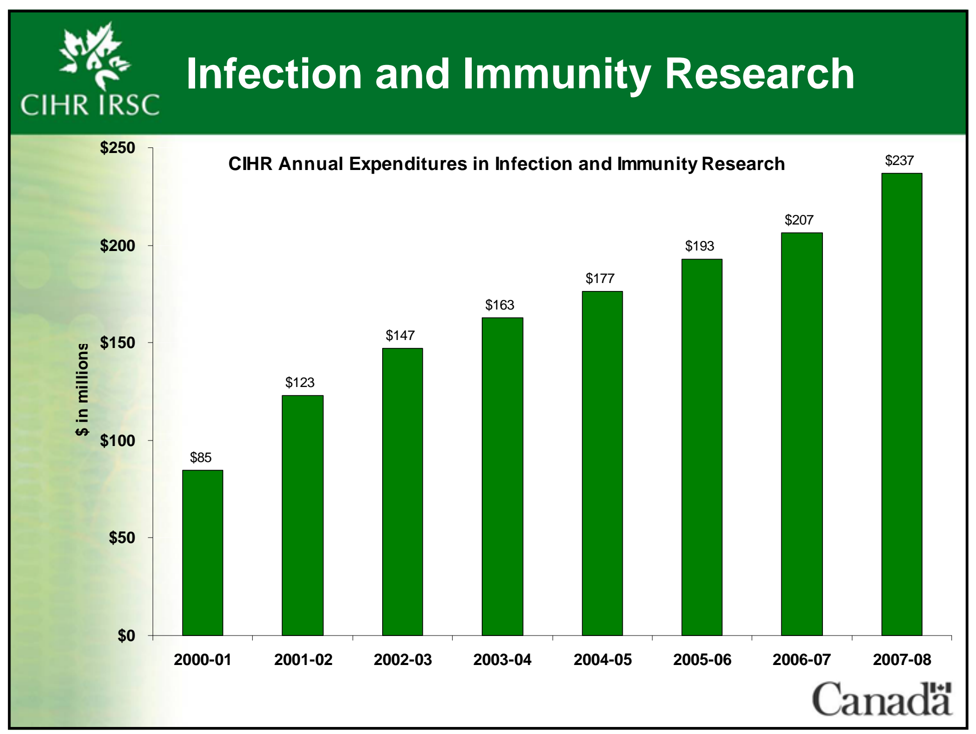
Appendix 4 – Bhagirath Singh's Presentation



CIHR IRSC

Institute of Infection and Immunity

Strategic Plan 2007-2012

Five Strategic Priority Areas

- **Emerging Infections and Microbial Resistance:** *Solutions from innovation in tools and technologies*
- **Immunotherapy:** *New approaches through systems biology*
- **Pandemic Influenza Preparedness:** *Prevention, therapy and public health challenges*
- **Vaccines of the 21st Century:** *Integrating innate and adaptive immunity and novel vaccine technologies*
- **HIV/AIDS:** *From prevention and therapy to addressing global health*

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Appendix 4 – Bhagirath Singh’s Presentation

CIHR IRSC

Institute of Infection and Immunity
Strategic Plan 2007-2012

Five Strategic Goals

- Encourage and support **high quality research** in infection and immunity that contributes important knowledge and new insights relevant to human health.
- Foster and sustain **innovative environments** to attract, train and retain high quality research personnel across the spectrum of disciplines contributing to the achievement of the Institute research mandate.
- Encourage and facilitate **knowledge translation** in all fields and sectors related to the Institute mandate.
- Develop and maintain **effective partnerships** that benefit research domains of the Institute.
- Maintain and enhance **organizational excellence** through effective planning, communication and collaboration

Canada

Implementation of III Strategic Plan
Knowledge Translation

Examples of Institute KT

- Institute-led research priority setting meetings
  - Prions, autoimmunity, systems biology, influenza, microbiome
- Institute-led KT activities
  - Food for Health museum exhibit, coalitions and consortiums
- Funding opportunities promoting KT
  - Integrated research users, multidisciplinary teams, SARS patient samples
- KT focused funding opportunities
  - Novel technologies, HIV community-based research program, Hep C social behavioural meeting
- Support for community-led KT activities
  - Meeting, planning and dissemination grants

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Appendix 4 – Bhagirath Singh’s Presentation

Translational Research Landscape

Life Cycle of Translational Research for Medical Interventions

From the initial discovery of a medical intervention to a highly cited article is a long road, and even this is not the end of the journey. There are immense difficulty of the scientific discovery process. Making unrealistic promises for quick discoveries and cures may damage the credibility of science.

(Science 321: 1298-1299, 2008)

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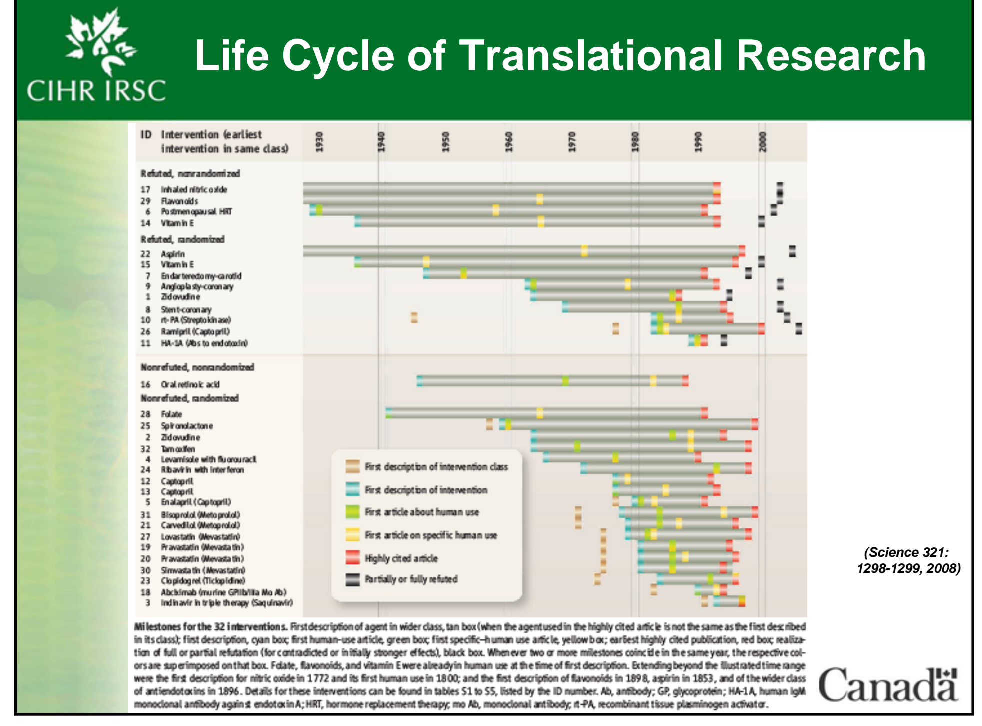

Appendix 4 – Bhagirath Singh's Presentation

Translational Research Landscape

Recommendations

- Discovery of new substances and interventions remains essential, but proper credit and incentives should be given to accelerate the testing of these applications in high-quality, unbiased clinical research and the replication of claims for effectiveness.
- Multidisciplinary collaboration with focused targets and involving both basic and clinical sciences should be encouraged.
- Proof of effectiveness for new interventions requires large, robust randomized clinical trials.
- Translational efforts for common diseases should focus more on novel agents and new cutting-edge technologies; for these ailments, it is unlikely that genuine major benefits from interventions already known for a long time have gone unnoticed.

(Science 321: 1298-1299, 2008)

Canada

Implementation of III Strategic Plan
Knowledge Translation

KT Project

- Provide an overview of knowledge translation activities carried out by III since its inception
- Develop recommendations for key activities the Institute can undertake to support and facilitate KT in infection and immunity research

Input

- CIHR and the Institute
- Consultant
- Survey
- **Workshop**

Canada

Implementation of III Strategic Plan
Knowledge Translation

Workshop

- Input on framework document
- Recommend where III focus KT efforts
- Refine priorities areas
- Identify actions to address priority areas

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Implementation of III Strategic Plan
Knowledge Translation

Project and Workshop Outcomes

- KT framework for III
- Recommendations for KT priorities areas and actions to address them
- Positive impact on establishing KT as an important activity for our research community to be involved in

Next Steps

- Review recommendations with Institute Advisory Board
- Develop implementation plan for KT recommendations

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Appendix 4 – Ian Graham's Presentation

Knowledge Translation at CIHR

Ian D Graham PhD
Vice President, Knowledge Translation

Infection and Immunity Research in Canada- Ensuring Impact
Workshop to Chart a Course for KT

September 25th, 2008

CIHR IRSC

Knowledge to action
Des connaissances à la pratique

Context: CIHR Mandate

4.0 The objective of the 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 health care system, by

- (diii) Work in collaboration with the provinces… to promote the dissemination and application of new knowledge to improve health and health services
- (h) promoting the dissemination of knowledge and the application of health research to improve the health of Canadians
- (i) encouraging innovation, facilitating the commercialization of health research in Canada and promoting economic development through health research in Canada

(5f) communicate with the public, governments, the Canadian and international communities, voluntary organizations and the private sector on issues pertaining to health or health research

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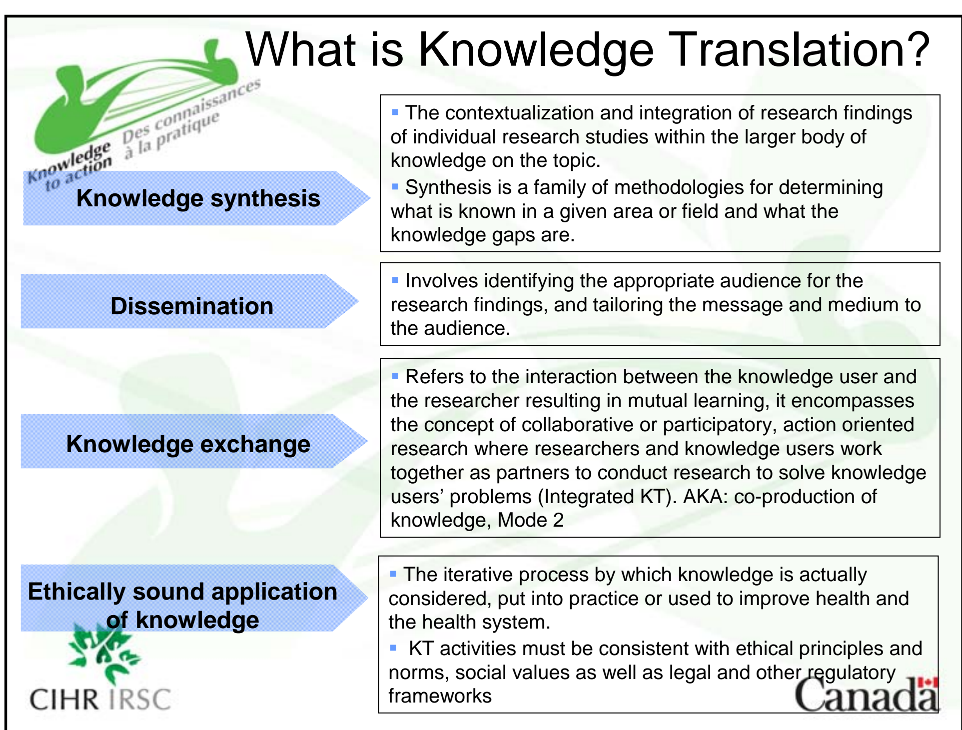
What is "Knowledge Translation*"?

KT is a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve the health of Canadians, provide more effective health services and products and strengthen the health care system.

This process takes place within a complex system of interactions between researchers and knowledge users which may vary in intensity, complexity and level of engagement depending on the nature of the research and the findings as well as the needs of the particular knowledge user.

* It is in our mandate



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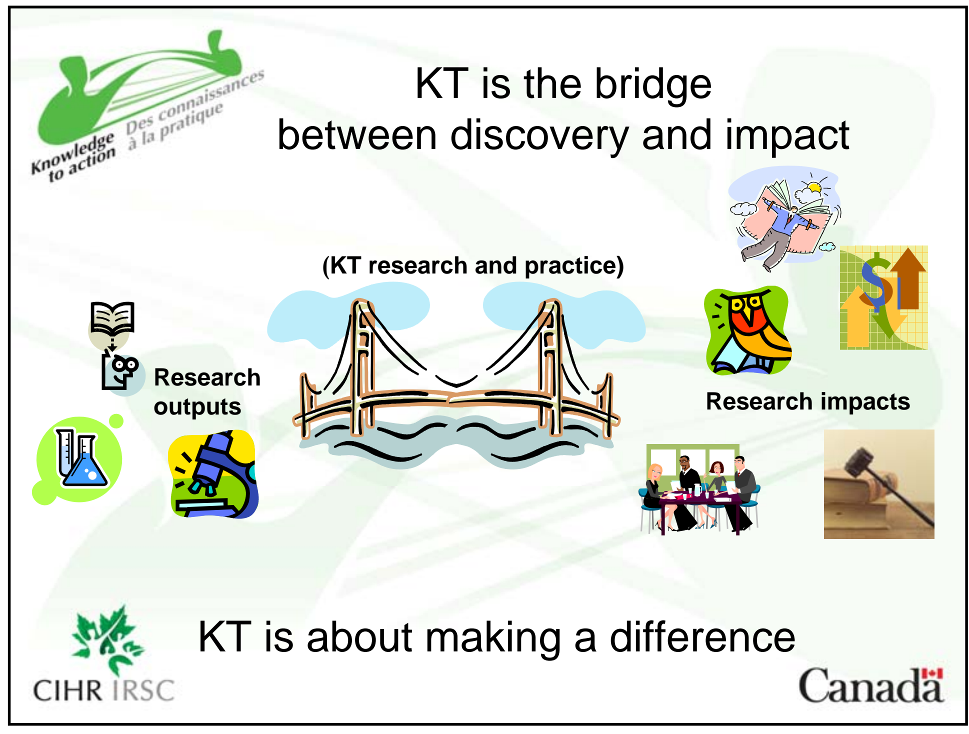

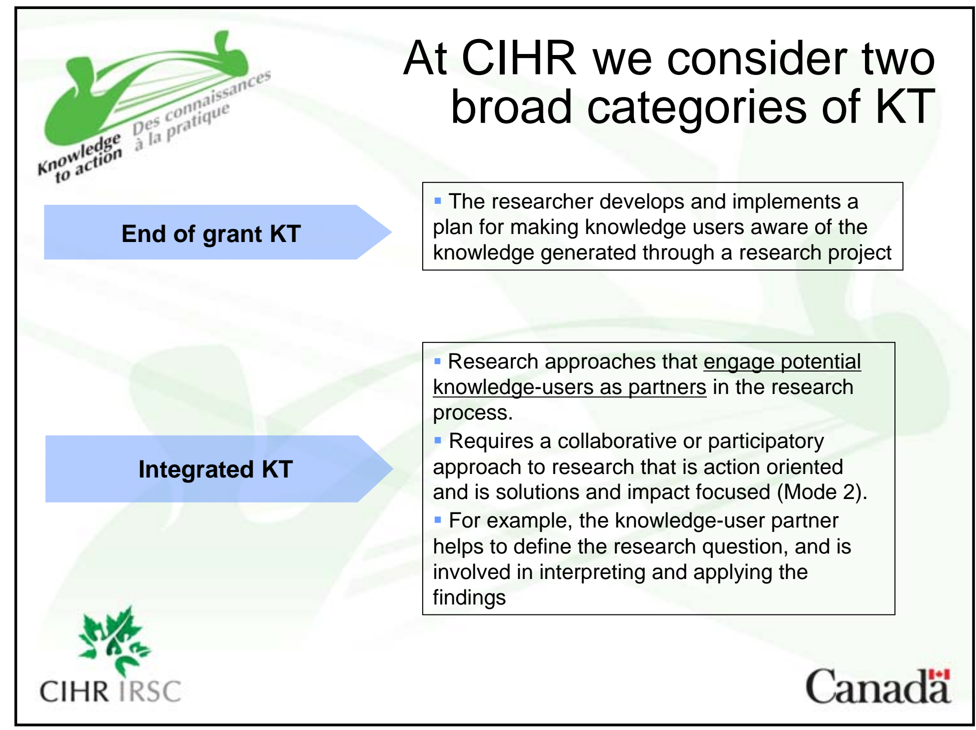

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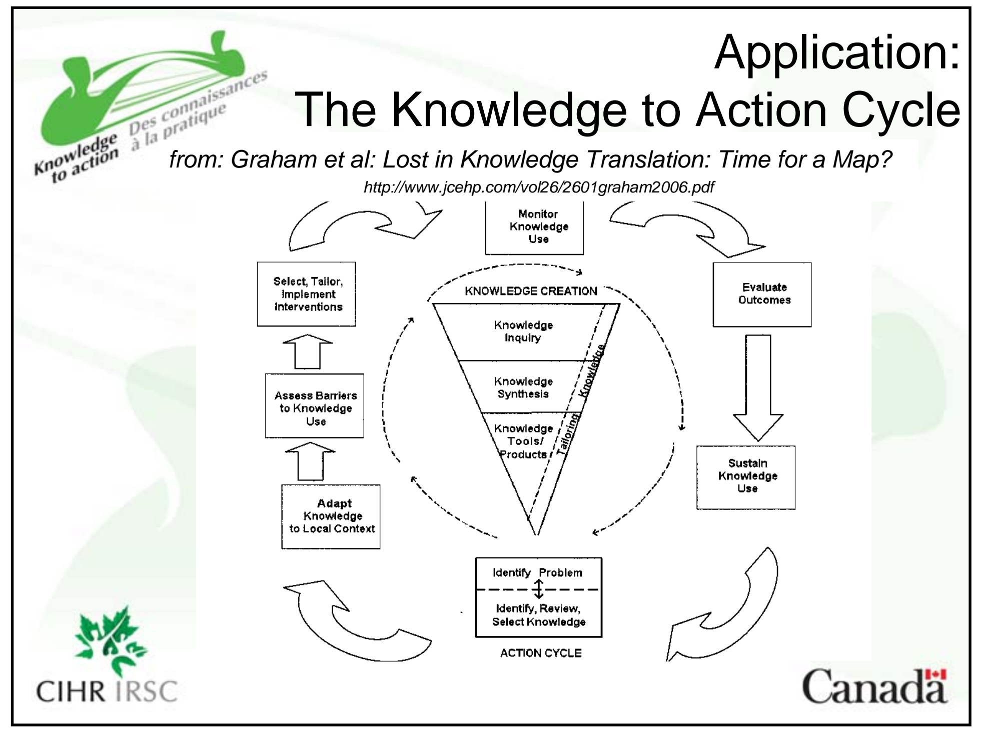

What is integrated KT?

- a way of doing research (ie an approach not a method)
- collaborative, participatory, action-oriented research; co-production of knowledge
- involves engaging and integrating knowledge users into the research process
- Knowledge users can be:
  - ✓ Policy makers, decision makers, researchers, the public, industry, clinicians, the media
  - ✓ Investigators from different disciplines, teams, countries

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What is integrated KT?

Knowledge users and researchers (knowledge creators) work together to:

- ✓ shape the research questions
- ✓ decide on the methodology
- ✓ help with data collection and tools development
- ✓ interpret the study findings and craft messaging around them
- ✓ move the research results into practice
- ✓ widespread dissemination and application

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Moving Knowledge into Action for Health and Economic Benefits

Advance the use of research to support a healthy and productive society and an effective health care system

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Context

- Knowledge translation is a process not an end point - it is the primary means by which CIHR will be able to fulfill its mandate to improve the health of Canadians.
- Commercialization is a form of KT. We must now determine the optimal role for CIHR in promoting the commercialization of health research (para 4) i).
- KT must be tailored to work effectively for research across the spectrum of health.
- The role of CIHR institutes in achieving our KT mandate is paramount as they are centrally located within the researcher, partner and knowledge user communities.
- CIHR’s many partners represent existing dissemination networks to targeted constituents.
- CIHR must be clear about the expectations that it has for researchers and its stakeholders with regard to doing KT.
- KT activities must be continuously monitored and evaluated.

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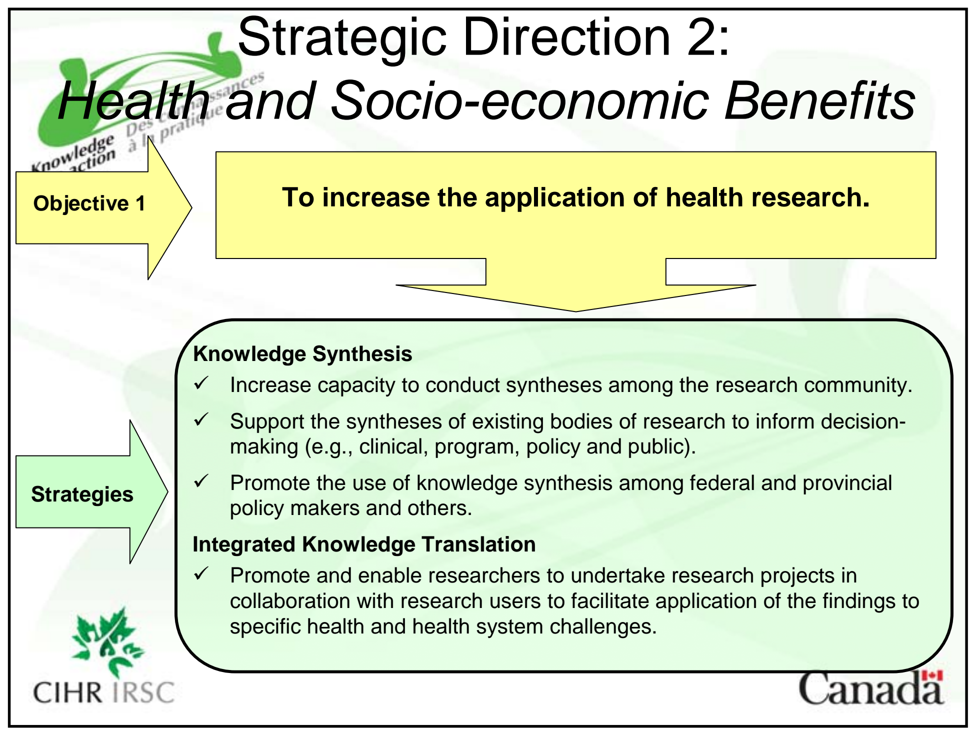

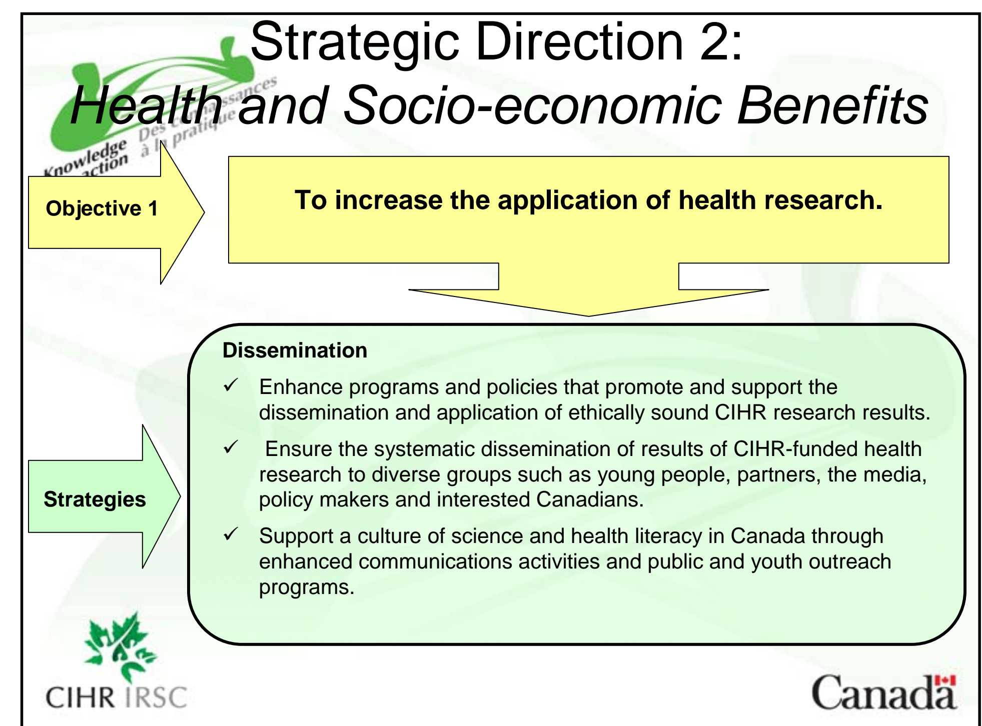

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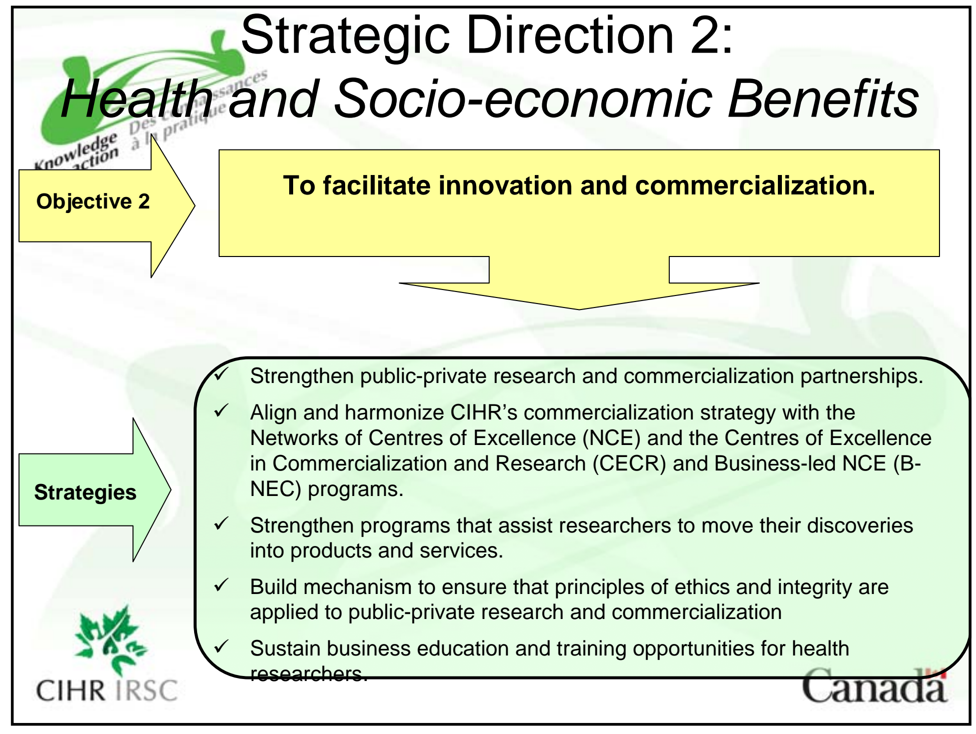

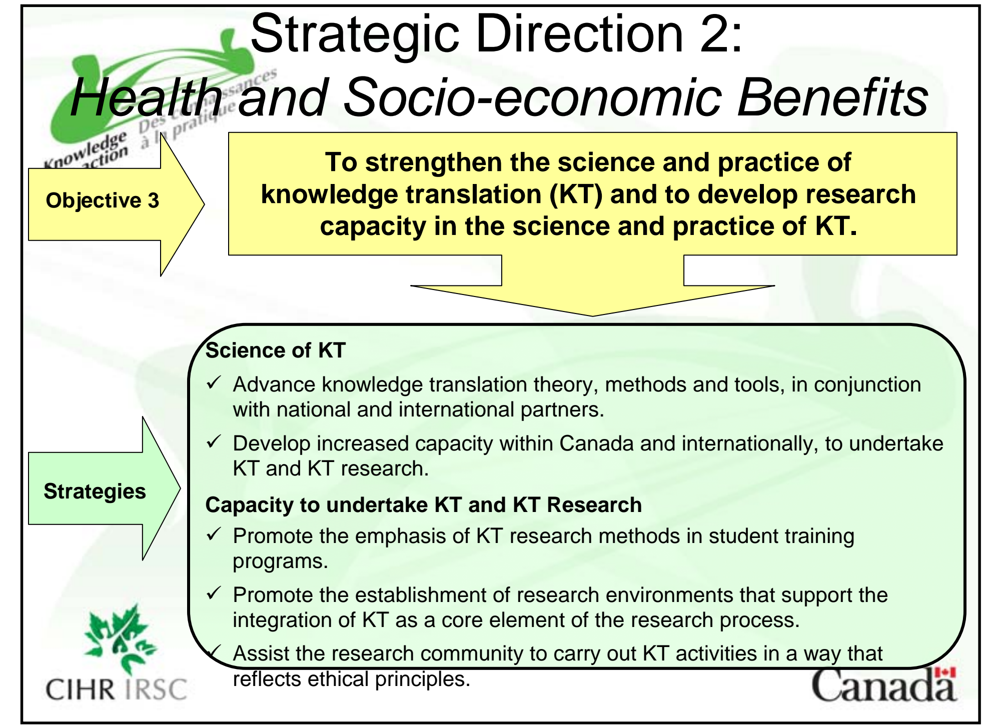

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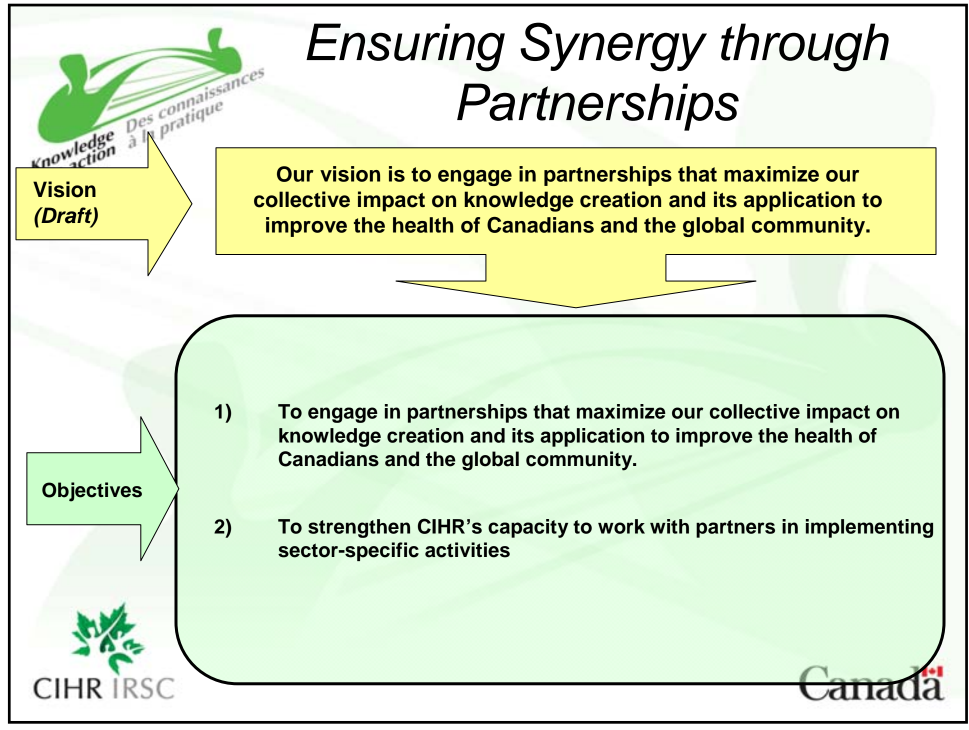

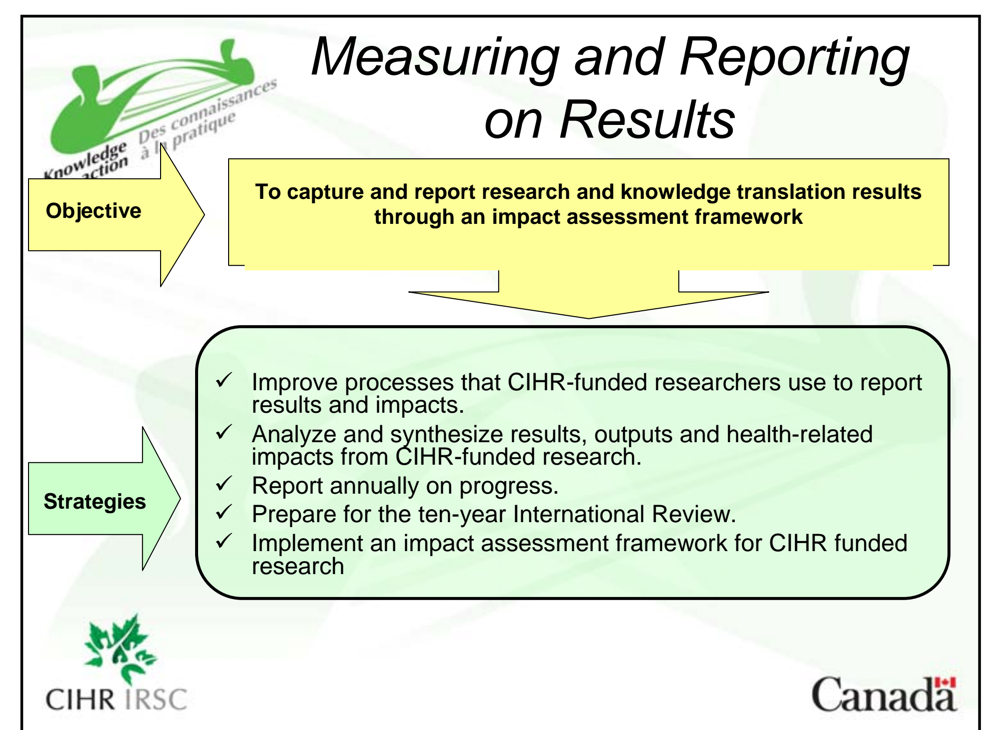

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KT Portfolio projects in the works

Currently working on a KT guide for researchers and for peer/merit reviewers that will:

- cover integrated as well as end of grant KT
- available to assist reviewers in their assessments of KT plans
- specific to CIHR themes/pillars

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KT Portfolio projects in the works

- Looking into models of how to conduct merit review
- Developing a citizen engagement framework
- Piloting a research reporting system (end of grant reports)
- Developing evaluation tools to assess the impact/success of partnerships
- Fine tuning a research impact and evaluation framework
- Promoting End of Grant KT Supplements
- Implementing the Open Access policy
- Developing an RCT results reporting policy

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Developing capacity in KT by:

- Publishing a KT Handbook (Spring 2009)
  - Content to be available on our website
  - Selected content to be published as a series in CMAJ
- Contracted three interactive educational modules
  - Synthesis
  - Critical appraisal skills
  - Participatory research (iKT)
- Potential to develop additional modules base on the KT Handbook chapters
- Working with the CIHR Institutes to coordinate KT training and curricula for summer institutes, etc

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