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**Expert Review Team Report
for
Institute of Nutrition, Metabolism and Diabetes**

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Chair, Expert Review Team
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TABLE OF CONTENTS

| | |
|---|----|
| Summary | 3 |
| Section 1 – Institute mandate | 8 |
| Section 2 – Status of this area of research in Canada | 8 |
| Section 3 – Transformative Impacts of the Institute | 9 |
| Section 4 – Outcomes | 9 |
| Section 5 – Achieving the Institute mandate | 10 |
| Section 6 – ERT observations and recommendations | 11 |
| Appendix 1 - Expert Review Team | 13 |
| Appendix 2 - Key Informants | 14 |

Summary

This is a summary of the main topics that emerged from our discussions. We felt it more constructive to pursue in some depth issues that arose in consideration of the Institute and CIHR generally with stakeholders than be restrained by a restrictive, pre-ordained format. However, commentary within the pre-specified bounds is also provided.

HUMAN CAPITAL

- There is a particular deficiency in physician scientists focused in their research on the transition from pillar 1 to pillar 2; the interface between basic and clinical research. Such individuals are (i) fundamental to the translation of discoveries in basic science to clinical utility; (ii) key to the detailed human phenotyping necessary to exploit advances in genomics that promise to revolutionize our understanding of disease and (iii) crucial to the development of strategies that will progressively personalize medicine. There is presently a national mismatch between the career opportunities for such individuals and the number of trainees competing for such positions.
- The Institute and CIHR generally might develop strategies that *formally* favor this constituency in competition for investigator initiated funding. Such strategies have been elaborated in part by other funders, such as the NIH, and include softening the pay line and assuring that a similar percentage of applications considered from this constituency are funded as from more mature investigators at each study section meeting. It is noted that this Institute most commonly amongst its peer organizations supports bridge funding which often favors beginning investigators. However, this does not substitute for a formal approach to the challenge.
- While such an approach will ease entry of new investigators, additional strategies should be adopted to convey the reality of a sustainable career. These might include (i) fiscal incentives for benchmarks of achievement; (ii) requests for applications that require components of clinical mechanistic research at the translational interface and (iii) longer grant cycles for such translational research given the timelines necessary for completion compared to basic research.
- An effort might be made to enhance recruitment of new investigators by (i) funding a visiting professor program where translational researchers would be required to “tell their story” as well as describe their research; (ii) requiring Canada Research Chairs to make such visits as part of their responsibilities; (iii) funding a program for medical students (and ideally, high school students) to spend time in Institute-funded laboratories.
- The CIHR might work with institutions and other relevant bodies to foster exposure to science – particularly the elucidation of mechanisms of physiology,

- These strategies might be applied to non physician early investigators, including those active in the health sciences, but the committee feels that there is a need to focus in particular in the dearth of physician scientists.
- The committee learned of the soon to be announced expansion of the Strategy on Patient-Oriented Research program in collaboration with industry. Although the details are unavailable, this initiative is most welcome. It is noticeable that although grantees are asked to discuss how their discoveries might be translated, Canada is one of the few developed countries that, thus far, has not initiated a major program to develop infrastructure and training in clinical and translational research. Such enabling investment is crucial if grantees are to fulfill this mandate.
- Canada Research Chairs are deemed to be the elite scientists in the Canadian biomedical community. The Institute and CIHR might consider adopting an open funding mechanism restricted to these chairs where the grant cycle might be longer (e.g. 7 rather than 5 years) and a single renewal cycle might be less onerous and more focused on accomplishments in the first cycle than would commonly be the case. The CIHR should develop and support these individuals as spokespersons for science at a national level. They represent a unique national resource to convey the importance of science to policy makers and the broader community.
- The CIHR might consider a program to present formally the attractions of a career in science to residency programs in major clinical disciplines such as medicine, psychiatry and surgery.
- The KRESENT program for renal fellowship training seems an impressive model although metrics for faculty retention in science with a relevant control group seems unavailable.

AREAS OF FOCUS

- The Institute has historically had a focus on obesity and this softened somewhat under the current leadership. Overall this less restrictive mandate has been welcomed, even beyond the obvious constituencies which are less directly connected to this theme.
- Increasingly funding bodies will be held to account by leadership in Government to demonstrate how investment in research has impact on the health and wealth of the nation. Presently, the Institute focuses on traditional metrics of accomplishment – building a network of obesity researchers in Canada, their presence on publications of scientific impact etc. The Institute might certainly record such metrics as short-term measures of success. However, they might

- Presently, other agencies – beyond CIHR - relate to much relevant data gathering for such an approach. However, it is time for CIHR, with this Institute in the lead, to catalyze a strategic integrative approach to impact assessment across CIHR and other agencies, such as Health Canada.
- Similarly, a strategic integration of programmatic funding by CIHR and this Institute with funding for infrastructure by the Canada Foundation for Innovation (CFI) – such as biobanks – with a considered approach to sustainability, is desirable. Where does such sustainability come from – the resources of CIHR or CFI? The committee recognises that this task will be under taken by CIHR and CFI across the various institutes; however, INMD should be extremely important to provide sustainability for those initiatives focused on INMD topics; as an example, INMD might contribute, in a flexible manner, to provide the human resources (dedicated nurses and technical staff) which are necessary to have such programs develop.
- As a joint CFI/CIHR strategy is developed, deployment of Canada Research Chairs in areas of strategic focus and investment should also be planned. Presently, it seems as if all three investments are only loosely and informally integrated.
- CIHR and this Institute in particular could take the lead in gathering and integrating data from provincial funders of all aspects of this research focus.
- Finally, it would seem as if food science is a general area where Canada could develop a world leading position. Given the focus of this Institute on (i) *Food and health*; (ii) *Environment and impact on common and rare disease genomics*; (iii) *Obesity* and (iv) *Continuum of care*, it would seem best placed to catalyze consideration of this option which would benefit the health and wealth of the nation and, as such, have particular political appeal.
- This would be an opportunity through workshops and lobbying to bring the food industry into scientific alignment with CIHR, CFI, and the Canada Research Chairs in an area where Canada could realistically hope to develop a world leading position in science and technology while also impacting favorably the health of individual Canadians.

GOVERNANCE AND STRUCTURE

- As the Institute considers increasingly interdisciplinary research where false conclusions can be reached due to lack of integrative context experts, the leadership might consider allowing a principal investigator (PI) response to the initial review and then a second level of review by Institute advisors who might co-opt content experts missing from the first round of review.
- There is increasing tension amongst investigators reliant on open competition versus those supported by “top down” funding initiatives. To some extent this parses asymmetrically across the four pillars of research with pillars 1 and 3 particularly reliant on open competition. For example, it was stated that it was 3-4 years since a new pillar 1/2 gastrointestinal (GI) investigator had been funded by the Institute.
- The Institute and CIHR in general might consider new funding initiatives to address this concern. One model is the NIH sponsored “Transformative RO1” (<http://commonfund.nih.gov/T-R01/>). Here, little preliminary data are required in support of an idea which would be truly transformative if it worked. A second model derives from HIV funding in France. An iterative approach to project development would occur. Firstly, a cluster of content experts would consider a one page proposal from an investigator. If this seemed promising a 3-4 page proposal would be considered and feedback provided. This would then set the stage for a full proposal.
- Strategies might also be adopted from elsewhere to enhance reviewing quality – creation of prestigious reviewer colleges, development of benefits (e.g. grant submission at any time) and in some cases, obligations on senior PIs of large grants.
- The metrics on industry involvement in the biomedical space and for entrepreneurship generally are dismal. This is a threat to CIHR strategy generally due to the political visibility of this phenomenon. Such observations support a focus area such as food science as discussed above. At a more particulate level, the program that provides matching funds for industry supported studies is viewed very favorably. However, a fatal flaw is to provide such funding to the investigator via the tech transfer offices of universities. Such offices are rarely cost effective and are an inappropriate vehicle for distributing CIHR support to investigators. Rather they should be provided via their appropriate academic body (e.g. a school of medicine) without subtraction of fees for services.
- This Institute could take the lead in fostering discussion across agencies about two areas particularly relevant to the interface with industry – conflict of interest and the changing landscape of intellectual property rules necessary to foster private – public partnerships that exploit the pre-competitive space.

- Overall, the role of this Institute and CIHR generally in “knowledge translation” needs to be clarified. Explicit objectives (e.g. influencing policy vs. adoption of specific health practices by the public) with attendant metrics should be stated. Ideally this should be done in ways that leverage other investments such as those by disease related medical charities.

Section 1 – Institute mandate

The Institute of Nutrition, Metabolism and Diabetes (INMD) is mandated to support research that enhances health in relation to diet, digestion, excretion and metabolism for a wide range of conditions and problems associated with hormone, digestive system, kidney and liver function.

CIHR Institute of Nutrition, Metabolism and Diabetes – Internal Assessment for 2011 International Review, pg 1

Section 2 - Status of this area of research in Canada

Initial exclusive focus on obesity has been broadened after consultation with representatives of stakeholders. However, obesity remains a central focus of the interest.

Although there are some who felt left out, the general impression is of a more inclusive strategy and an overall understanding to have some general areas of emphasis. Both renal and GI constituencies reflected this feeling of improvement.

Still a perception of neglect of mechanistic investigators remains, especially physician scientists, who operate in or across pillars 1 and 2.

Recognized impact on the magnitude of the network of obesity researchers in Canada.

Overall impression of the Canadian research landscape in this area

Need to address the deficiency in human capital in the domain of pillars 1 and 2, particularly physician scientists.

Need to look beyond conventional metrics of short-term success and to link this to intermediate and long-term metrics that relate to health outcomes.

This will require strategic interaction with other agencies which this Institute is well positioned to lead.

Section 3 - Transformative Impacts of the Institute

Certainly, an improvement in perception of this Institute in the past several years.

Has had an impact in presenting a focus for obesity research and, in that sense, has had a transformative impact on the community.

Has begun to forge partnerships with other entities such as Health Canada and Statistics Canada.

Overall impression – to what extent has this Institute been transformative?

Needs to take the lead in catalyzing interaction between the many stakeholders who collect data relevant to assessing the impact of enhanced obesity research capacity on medium term (e.g. incidence of childhood obesity, prevalence of adult obesity and diabetes metrics) and long term (e.g. cardiovascular deaths- indices of health).

Could also play a catalytic role in bringing agencies and agribusiness together to consider making food science an interdisciplinary translational priority for Canada.

Could catalyze discussion around creating translational infrastructure in Canada as exemplified by Clinical and Translational Science Awards in the US. Perhaps there should be some form of a “translational mandate” in many of the grants.

Could catalyze discussion around industry / academia interface as summarized above.

Section 4 - Outcomes

Has created the Canada Obesity Network and contributed to enhanced training (e.g. the Obesity Boot Camp; the Canadian Child Health Clinician Scientist Program).

Has leveraged resources from hospitals, provincial governments and charities – although no figures were provided.

Has provided more bridge funding - which helps asymmetrically, young investigators – than all the other CIHR institutes.

Strategic interactions with provincial governments could begin with a few « bright lights » to obtain initial proof of principal.

Overall impression – to what extent has this Institute been successful in achieving outcomes?

Good start, but needs to act as the catalyst for much more connectivity amongst organizations scattered across the food science spectrum to develop a strategic approach to the opportunity and the challenge. Besides obesity, this can embrace other areas – such as salt reduction – that include other domains of the Institute’s constituency of researchers – in this latter case, renal physicians and scientists.

Such interactions will clarify major initiatives such as biobanking where programmatic and infrastructural contributions from discrete funding bodies are defined at initiation of the project, but it is unclear who pays for sustainability. Here, interaction with initiatives such as the Biobanking and Biomolecular Resources Research Infrastructure in Europe which has experience with such issues would be helpful.

Section 5 - Achieving the Institute mandate

The broad community feels better served by the Institute in recent years. However, the focus on obesity highlighted interactions across all 4 pillars of Institute-funded research.

Traditional academic metrics speak to the success of the Institute in addressing its mandate.

Broadly, CIHR may have to « do fewer things and do them better » and this is also true of this Institute. Besides focus, this means leveraging interactions with other quasi non-governmental organisations, medical charities, provincial governments and industry.

The CIHR and this Institute could catalyze interactions between these bodies to clarify strategic opportunities for those that formulate policy without « tainting its scientific mission ». CIHR has already done something like this in multiple sclerosis research.

Identifying cross cutting interdisciplinary themes within INMD would help address the issue of heterogeneity of this Institute. As an example, the committee suggested that focussing on areas like inflammation allow for participation from all traditional constituencies on an open call basis and may diminish feelings of structural disenfranchisement.

Could educate the public and politicians on (i) how long it takes to develop a successful drug or diagnostic and how (ii) both efforts contribute to the health and wealth of the nation. This builds the case for incremental investment in basic and clinical research. The Institute budget is very limited, given its mandate.

Overall impression – to what extent has this Institute achieved its mandate?

The Institute has been very successful in addressing the mandate within the narrow terms of obesity research.

The committee felt it should build on this achievement to take a more expansive view of its potential.

The Institute might clarify its expectations around knowledge transfer – to whom and in what form? Develop a strategy to engage non-governmental organisations and advocacy groups. Build on the Partnerships for Health System Improvement programs.

It might exploit a focus on industry/academia interactions to bring guidance on some complex ethical issues such as conflict of interest.

Section 6 - ERT Observations & Recommendations

These are summarized in detail in the prelude.

Overall impression of the performance of this Institute

The efforts of the Institute to build a community of obesity researchers of international visibility have been successful.

The loosening of focus under the current leadership has been broadly appreciated.

The Institute could exploit further its capacity to leverage its influence and promote a more strategic approach to solving Canada's health challenges in this domain and exploiting commercial potential.

Recommendations

Address aggressively the limited human capital with expertise to span the T1 translational divide with a particular emphasis on physician scientists.

Foster investment in translational infrastructure, linking programmatic and infrastructural strategies with a particular emphasis on sustainability – from research careers through to biobanks.

Play a more strategic and catalytic role with the objective of harnessing the capabilities and objectives of multiple agencies to deliver a politically tractable message that influences policy. French governmental use of the Institut national de la santé et de la recherche médicale to gather data on obesity is a good model.

Move beyond traditional short-term academic metrics to link these to real clinical outcomes, thus demonstrating the value of investment in research.

Appendix 1 - Expert Review Team

Chair - Dr. Garret A. FitzGerald

Chair, Department of Pharmacology

Director, Institute for Translational Medicine and Therapeutics

University of Pennsylvania, USA

Expert Reviewer – Professor W. Philip T. James

President, International Association for the Study of Obesity

Honorary Professor of Nutrition, London School of Hygiene and Tropical Medicine, UK

International Review Panel – Professor Christian Bréchet

Vice-President - Medical and Scientific Affairs

Institut-Mérieux, France

Appendix 2 - Key Informants

Session 1 – Review of Institute

1. **Dr. Philip Sherman, INMD Scientific Director**
2. **Dr. Stephanie Atkinson, Chair – Institute Advisory Board**
Professor and Associate Chair (Research), Pediatrics
McMaster University
3. **Dr. Denis Richard**
Director, Centre for Research on Energy Metabolism
Université Laval
4. **Dr. Stephen Collins**
Associate Dean, Research, Faculty of Health Sciences
Professor, Department of Medicine
McMaster University

Session 2 – Consultation with researchers

1. **Dr. John Wallace**
Professor, Division of Gastroenterology, Department of Medicine
McMaster University
2. **Dr. Lise Gauvin**
Professor, Department of Social and Preventive Medicine
University of Montreal
3. **Dr. Kevin Burns**
Senior Scientist, Chronic Diseases, Ottawa Hospital Research Institute
Professor, Division of Nephrology, University of Ottawa and Ottawa Hospital

Session 3 – Roundtable with stakeholders

1. **Mr. Paul Shay**
National Executive Director
Kidney Foundation of Canada
2. **Dr. Steve Vanner**
VP Research Affairs
Canadian Association of Gastroenterology
3. **Ms. Kimberly Elmslie**
Director General, Centre for Chronic Disease Prevention and Control
Public Health Agency of Canada