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INTERNATIONAL REVIEW

OF THE

CANADIAN INSTITUTES OF HEALTH RESEARCH

Expert Review Team Report
for
Institute of Neurosciences, Mental Health and Addiction

Submitted by: Professor Trevor Robbins
Chair, Expert Review Team
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Canadian Institutes of Health Research | Instituts de recherche en santé du Canada

Canada

TABLE OF CONTENTS

Summary

Canadian neuroscience is highly competitive internationally, with research in pain, neurodegeneration and brain imaging to the fore. The Institute of Neurosciences, Mental Health and Addiction (INMHA) has made excellent progress in using its strategic grant from INMHA in the Review period to harness matching funding from diverse sources, including other CIHR institutes, to support high profile neuroscience programs, including the Regenerative Medicine and Nanomedicine Initiative (now coming to an end), and a new proposal on epigenetics. INMHA had created an innovative and bold new research partnership with China and several European countries, as well as a pioneering initiative on neuroethics. The second strategic plan of INMHA outlines several other imaginative research objectives, focusing on strategic training and partnerships in regenerative medicine, first episode events in mental or neurological illness and addiction, comorbidities of brain disorders with mental health problems, and nicotine addiction. The 'first episode' program had been seminal in the creation of NeuroDevNet, another, recently established Network of Centres of Excellence, stemming from research on the foetal alcohol syndrome. These had all been transformative impacts of INMHA. This was also apparent from the success of INMHA-affiliated scientists in the CIHR Operating Grants competition, where funding in absolute terms had dramatically increased (although there had been a slight decrease in proportional terms). INMHA had also helped to transform the Canadian Association for Neuroscience by integrating its diverse scientific interests and had greatly increased public dissemination via its backing for the popular Café Scientifiques. The large number of these Café Scientifique meetings was clear evidence of enthusiastic participation and considerable effort by the researchers affiliated to the INMHA to engage with the public about their work.

There were also signs of increasing engagement with issues of mental health, although there was no evidence to date of a transformative effect in this domain. Indeed, more engagement with provincial heath services, aboriginal and minority elements, patient groups and charities, and the Mental Health Commission was highly desirable. International collaboration in clinical trials was necessary, in the absence of extensive funding and patient base, for example with the National Institute of Drug Abuse (NIDA) of the US in the addictions.

In terms of outcomes, for the 'Emerging Teams' scheme of INMHA, 9/30 applications (30%) had been funded in 2008-2010 with an approximate INMHA allocation of $3.6M (supplemented by funds from CIHR). However, there was concern from the scientific community about sustainability of newly-formed teams, given the low rate of CIHR operating grant awards. Nevertheless, INMHA had also enabled many investigators to be successful with such funding though the award of 85, 1 year 'bridging grants'.

Capacity building had included support for 18 thematic training programs supported by INMHA and some of these had evidently contributed to the continued success of pain research in Canada. However, it was unclear what were the career destinations of PhD researchers trained under INMHA; no details had been provided on this, and so it was impossible to evaluate the success of the program in terms of its contribution to Canadian neuroscience and mental health research, and also to individuals with PhDs

moving into non-research trajectories. There was also concern at the relative lack of clinician-researchers (e.g. in radiology and psychiatry), which is also a global concern.

Outcomes with respect to mental health and addiction stakeholders were also in general unclear, despite the commissioning of two trail-blazing national reports which had consulted many stakeholders ('Out of the Shadows' and 'Unique challenges in Sensory and Communication Disorders') and the initiation of several forms of activity with mental health services and patient oriented stakeholders. For addiction, there had been innovation in the treatment of drug abusers via the INMHA supported Insite group which had provided the first medically supervised injection site in North America. INMHA was also exploring the development of a clinical trials intervention network (CIN) modelled on the success of that of NIDA, linked to the CIHR Strategy for Patient-Oriented Research (SPOR). However, linking the traditional Canadian strengths in basic neuroscience in the addictions to clinical programs had not apparently occurred.

Based on the available evidence, the Panel is confident that these parts of the INMHA mandate relating to basic neuroscience are being amply fulfilled with the aid of imaginative leadership. The goal of INMHA in reducing "the burden of brain illness, through prevention strategies, screening, diagnosis, treatment, support systems and palliation" is a much more difficult one to attain, although INMHA is making some progress in establishing the necessary bedrock of research in basic neuroscience and appreciating its connections to the clinic. Some groundwork in the understanding of mental health disorders is also being laid, in readiness for opportunities for translation, but it is unclear at present if the present clinical and health services infrastructure, partnerships and cadre of available clinical researchers will be sufficient to meet the ultimate tests of 'in principle' experimental medicine and Phase 3 clinical trials. Overall, considerable progress had been made by INMHA in harnessing resources to advance neuroscience and mental health research and thus achieve its own mandate. However, the SPOR needed now to 'kick on' from its landmark surveys of mental health in Canada and engage more proactively with potential stakeholders. It was possible that the area still suffered from 'institutional stigma' despite these efforts, and this urgently needed to be redressed.

The Review Panel's recommendations were as follows:

1. INMHA should take steps to enhance communications and public relations with INMHA investigators and stakeholders, in terms of feedback and user-friendly information about funding schemes. The present system with one communications officer deployed to INMHA from an overall team of about 10 within CIHR appears far from optimal and leads to damaging misperceptions. This lack of communications infrastructure for INMHA also considerably diminishes the visibility and specific public relations performance of INMHA to adversely affect its political effectiveness in a range of contexts, including government (although it is realised that some relevant activity is presently largely undertaken by the CIHR Scientific Council).

2. More consultancy by INMHA is required to build bridges with stakeholders with the aim of delivering joint action plans in the context of mental health/health services research and industrial collaborations. Greater consultancy with stakeholders and

investigators alike would also allow the workings of the Institute Advisory Board (IAB) to become more transparent to the scientific and health services communities. Membership of this Committee should be reviewed regularly to involve a large number of stakeholders, which should also probably meet more regularly.

3. Adopting active partnerships and networking with organizations such as NIDA and ADNE to enable large clinical trials.

4. Review strategy for mental health and addiction research, including training of clinician-scientists, and relationships with mental health organizations and services. Possible introduction of Career Development Awards or a similar scheme for young physicians who have been inspired by scientific curiosity and suitable role models for translational research.

5. Take pains to communicate outcomes of INMHA collaborations with Pharma and Biotechs to these partners in order to enhance the opportunities for further partnership.

6. Review strategy for maintaining continuity of effective and successful research teams.

7. Urgently address career destinations and achievements of the pre-doctoral and post-doctoral training programs.

8. Review assessment of grant applications (this being a more general CIHR problem), in terms of volume and difficulties of obtaining good peer reviews (possible incentives for the latter also need to be considered).

Section 1 – Institute mandate

"…the mandate of the Institute of Neurosciences, Mental Health and Addiction is to support research that enhances knowledge of the brain, mental health, neurological health, vision, hearing and cognitive functioning. The goal is to reduce the burden of brain illness through prevention strategies, screening, diagnosis, treatment, support systems and palliation.….INMHA's mission is to foster excellence in innovative, ethically responsible research in Canada that aims to increase our knowledge of the functioning and disorders of the brain and the mind, the spinal cord, the sensory and motor systems, as well as mental health, mental illness and all forms of addiction."

CIHR Institute of Neurosciences, Mental Health and Addiction – Internal Assessment for 2011 International Review, pg 1

Section 2 - Status of this area of research in Canada

Canadian neuroscience has a remarkable legacy deriving from the early success and discoveries of individuals such as Donald Hebb, Wilder Penfield, Brenda Milner, Ronald Melzack, Heinz Lehmann and James Olds. This legacy has been reinforced in recent years by a new generation of Canadian neuroscientists, nurtured by such powerful funding initiatives as the Canada Research Chairs (of 2000 Chairs, 50% were for health sciences) and Networks of Centres of Excellence (NCEs)(e.g. for Prion Research), as well as by a tradition of funding from the Medical Research Council (MRC) and more recently the Canadian Institute of Health Research (CIHR). With a total budget of over $1billion, CIHR had formed the INMHA in 2001 as one of its 13 institutes. The mission of INMHA is set out in detail in their submission to this Review, but is essentially to champion inter-disciplinary research that enhances knowledge about the brain and mental health, with a view to clinical translation. INMHA receives $8.5M annually from the 'strategic' component of the CIHR budget. In order to fulfil its mission, INMHA seeks to engage in innovative partnerships that lever funding from a variety of organizations, including other institutes of the CIHR, the Natural Sciences and Engineering Research Council of Canada (NSERC), universities and the provinces, and end-user groups such as the Mental Health Commission of Canada, which INMHA played a role in establishing.

The general impression gained from this review is that Canadian neuroscience is quite richly served by a variety of funding mechanisms, including the bodies mentioned above and special national infrastructure schemes that support capital and major equipment costs. This highlights the key function of INMHA to add value to these different schemes by their strategic co-ordination, as well as by optimising the quality of grant applications in the area of neuroscience, mental health, and addiction to the independent Operating Grants competition of the CIHR. This is an innovative, though admittedly experimental, approach to the problem of harnessing the maximum potential of government and private

foundation research funding. It differs markedly from the intra-mural culture of countries such as the UK (where a large proportion of MRC funding goes into funding its Institutes and Units) and the USA. There is thus no intra-mural system of the CIHR in Canada - which then has to respond to special circumstances (e.g. epidemics) or the demands of risky, long-term or major investments (e.g. Positron Emission Tomography (PET) research; infrahuman primates) in different ways, such as its NCEs.

The state of the field in Canada can be discerned by several indicators, including the value of awarded grants and bibliometric indices. In fact, INMHA's mandate accounts for about 28% of the CIHR funding envelope (amounting to about $132M) and 17% of strategic programs (about $41M in 2009-10) – indicating that INMHA accounts for a very significant proportion of CIHR funds.

Moreover, Canadian neuroscience is retaining its overall position among the leading nations contributing to this field, as demonstrated by the recent bibliometric analyses provided by the INMHA, especially in view of its population relative to the USA or the UK. Such evidence suggests that Canadian neuroscience excels in areas such as pain research. The enormous current interest in stem cells and regenerative medicine has been stimulated in part by basic discoveries by Canadian neuroscientists and has resulted in a Regenerative Medicine and Nanomedicine Initiative (RMNI). There was also basic strength in neuroimaging and neurodegenerative disorders.

As a more general indicator, the Canadian Association for Neuroscience (CAN) (which has received support from INMHA) is flourishing, as evidenced by the high attendance (about 1000) at its annual meeting (comparing well with individual European national societies). Intervention and funding by the INMHA has helped to invigorate CAN and integrate within it effective networking of several forms of research interests in the neurosciences.

Considering some of the challenges to Canadian neuroscience; major support from industry (such as big Pharma) has never been a prominent component of the Canadian neuroscience research landscape, although there are several examples of successful small biotech companies being formed there by neuroscience researchers. The availability of industry outlets is also relevant to career development of young Canadian neuroscience researchers; the eventual career paths being provided for many PhDs currently being produced in the system are not always obvious.

It is not clear how well clinical neuroscience and mental health research is faring in Canada, because of the problems inherent in the training of excellent clinician-scientists, an issue of general international significance, as well as the severe challenges of effective clinical translation. It is also generally problematic to determine the optimal balance between basic and translational research and how best to fund this.

Section 3 - Transformative Impacts of the Institute

Given the complexities of the Canadian system with so many separate funding schemes, it is essential strategically to optimise and add value to them, a transformative function that INMHA has evidently fulfilled. Thus INMHA, through the leadership provided by its Scientific Directors, has enhanced an inter-disciplinary, team-based approach necessary for progress in brain research, especially via its 'Emerging Teams' scheme. This scheme provides additional funding to enable collaborations among existing CIHR-funded researchers working on related problems. INMHA has also engaged in several imaginative partnerships with other organizations, including most notably the RMNI with NSERC. There have also been catalyst grants in collaboration with the National Anti-Drug Strategy with Health Canada, and the National Population Health Study on Neurological Conditions with the Public Health Agency of Canada. The innovative University of Laval program in Integrative Neuroscience and Photonics had also benefitted from an envelope of funding organised by INMHA.

The second strategic plan of INMHA outlines several other imaginative research objectives, focusing on strategic training and partnerships in regenerative medicine, first episode events in mental or neurological illness and addiction, comorbidities of brain disorders with mental health problems, and nicotine addiction. The 'first episode' program had been seminal in the creation of NeuroDevNet, another, recently established NCE, stemming from research on the foetal alcohol syndrome.

The present Review Panel was particularly impressed by a new initiative on epigenetics that spanned basic molecular mechanisms potentially as far as applications to clinical studies. Spurred in part by the seminal work of a leading Canadian neuroscientist, this emerging INMHA initiative has levered $36M from various sources including $12.5M from two other CIHR institutes (Genetics and Cancer Research), matched by central corporate funds, and topped up by $25M from Genome Canada. They were working on several other funding initiatives, for example with Bell Canada, to secure $50M for mental health research.

Other major successes had been the Neuroethics Initiative which had helped to found the field world-wide and had helped to attract a seminal figure from Stanford to a Canada Research Chair at the University of British Columbia. Professor J. Illes had produced an INMHA-sponsored syllabus for neuroethics that could be adopted by all Universities. This initiative has thus represented a proactive approach to the importance of ethical approaches in neuroscience which other areas of science would do well to follow.

At home, the transformative aspects of INMHA have also been indicated by its success in the CIHR Open Operating Grants competition, where funding in absolute terms had dramatically increased (although there had been a slight decrease in proportional terms). INMHA had also helped to transform CAN by integrating its diverse interests and had greatly increased public dissemination via its backing for the popular Café Scientifiques. The large number of these Café Scientifique meetings was clear evidence of enthusiastic participation and considerable effort by the researchers affiliated to the INMHA to engage with the public about their work.

On the international stage, INMHA can count among its transformative successes the bilateral partnership with China which has twinned 135 Canadian laboratories and funded 89 teams within a joint China-Canada funding envelope. This was especially significant for collaborative research in Alzheimer's disease (with a strategic focus on vascular dementia) and in functional genomics, given the huge Chinese population. There had also been notable partnerships reached with the USA (NIDA) and European countries in specific areas. Canadian teams had penetrated several networks funded by the EU.

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

Overall, INMHA had achieved considerable success in potentially transforming neuroscience research from the relatively modest funding base provided by CIHR. The previous and current Scientific Directors should be congratulated on their leadership, vision and achievements in this domain. The examples provided above indicate considerable promise of substantial achievement in the area of neuroscience. There were also signs of increasing engagement with issues of mental health, although there was no evidence to date of a transformative effect in this domain. Indeed, more engagement with provincial heath services, aboriginal and minority elements, patient groups and charities, and the Mental Health Commission was highly desirable. International collaboration in clinical trials was necessary, in the absence of extensive funding and patient base, for example with NIDA of the US in the addictions.

Section 4 - Outcomes

In objective terms, the success of INMHA to date can be gauged in part by the current bibliometric and grant funding indicators described above. There had been evidence of acceleration and growth in these over the past 5 years. In terms of funding, to take one example in more detail, INMHA has committed about 11% of the total funds of RMNI and about 47% of all grants within this initiative were relevant to INMHA. For the 'Emerging Teams' scheme of INMHA, 9/30 applications (30%) had been funded in 2008-2010 with an approximate INMHA allocation of $3.6M (supplemented by funds from CIHR). This compares with the earlier period (2005-2007) of 7/35 (20%, $1.8M, INMHA).

There was also evidence of the initiation and planning of several major projects and programs which are difficult to assess in terms of precise outcomes (other than dollar value) at this stage. Funding for a long-running major initiative such as RMNI was shortly to come to an end, and its detailed evaluation was only just beginning. The Canada-China joint research initiative had received a very satisfactory internal evaluation in 2009. Economic outcomes will also probably take longer even than bibliometric ones to become apparent.

Interviews with representatives of the neuroscience research community and related stakeholders revealed considerable appreciation of what INMHA had achieved and general support for its objectives. INMHA had evidently contributed to the training and

career development of many investigators, in part through its support of team networks, through ‘Team Grants’. The latter had been replaced recently by a new scheme of ‘Emerging Teams’. There were however, some concerns. It was unclear how the cross-disciplinary initiatives could be maintained when the ‘Emerging Team’ grants were only ‘one-off’. Investigators had to return to the Open Operating Grant competition to maintain research momentum, but there was currently only a 17% award rate here in the face of mounting numbers of applications and this was causing a certain amount of demoralization in investigators. Research teams using complex research infra-structure such as PET were concerned about sustainability and continuity of support. Whilst there were avenues through a variety of inter-digitating schemes to achieve this continued funding, the process was arduous and uncertain, leading to considerable risk for INMHA investments in the maintenance of its established research teams.

In general, there was a perception by some of its funded investigators that INMHA had focused overmuch on external ‘out-reach’ rather than on ‘in-reach’ communication with its scientific investigators, and was a victim of over-centralised administration by CIHR (e.g. in terms of communications). There is a good deal of confusion in the minds of investigators; for example, they are blaming the apparently low Open Operating Grant success (i.e. 17%) in terms of a reduced budget resulting from new investment in ‘Emerging Teams’. They apparently fail to appreciate that this is a separate budget. They also do not see why the INMHA budget should be equivalent to that of the other institutes when its operating grant funding success is greater. Finally, they may not realise that some of INMHA’s research budget is dedicated to funding 85, 1 year bridging grants to enable a degree of continuity of research support in many instances and that the lack of restriction on grants submitted and re-iteration of failed grants enables in fact a much higher rate of funding than 17%. The Scientific Director mentioned that 70% of investigators receiving bridging were subsequently successful in funding.

Capacity building had included support for 18 thematic training programs supported by INMHA and some of these had evidently contributed to the continued success of pain research in Canada. However, it was unclear what were the career destinations of PhD researchers trained under INMHA; no details had been provided on this, and so it was impossible to evaluate the success of the program in terms of its contribution to Canadian neuroscience and mental health research, and also to individuals with PhDs moving into non-research trajectories. There was also concern at the relative lack of clinician-researchers (e.g. in radiology and psychiatry), which is also a global concern, though one which could readily be addressed in the Canadian context by INMHA. The highly promising clinical researcher interviewed by the Panel had initially gained a PhD and only later moved to medicine, so she had not been typical. There was an apparent lack of suitable role models, or possibly of their identification for the preclinical community, one obvious example being Dr P. Blier. The strategic choice of INMHA to invest almost half of its resources into training may be a good one, but concerns were raised that the current infrastructure does not support career development for such a large number of trainees. Moreover, this investment can be viewed, probably erroneously, as supporting the training laboratories rather than building capacity in the absence of a clear commitment to foster the career of the trainees through junior faculty academic appointments.

Outcomes with respect to mental health and addiction stakeholders were also in general unclear, despite the commissioning of two trail-blazing national reports which had consulted many stakeholders ('Out of the Shadows' and 'Unique challenges in Sensory and Communication Disorders') and the initiation of several forms of activity with mental health services and patient oriented stakeholders. For addiction, there had been innovation in the treatment of drug abusers via the INMHA supported Insite group which had provided the first medically supervised injection site in North America. INMHA was also exploring the development of a clinical trials intervention network (CIN) modelled on the success of that of NIDA, linked to the CIHR Strategy for Patient-Oriented Research (SPOR). However, linking the traditional Canadian strengths in basic neuroscience in the addictions to clinical programs had not apparently occurred. Indeed, emphasis on biological aspects of addiction appeared to be diminishing in one well-known research centre funded by the Province of Ontario.

INMHA had been a key player in a $15M initiative co-led by Public Health Agency of Canada and Neurological Health Charities of Canada. This was revealing fundamental epidemiological data, for example related to the incidence of multiple sclerosis. There was an INMHA contribution to a CIHR initiative on Alzheimer's disease involving that Society, although it was too early to assess its success. However, INMHA had been unable to help fund a quick, 'in principle' clinical trial initiative by the ALS Society, despite the priming of therapeutic strategies by basic neuroscience researchers.

There is a similar picture in the mental health (and health services) domain. There has been activity in the form of the initiative on mental health in the workplace conducted in collaboration with the Institute of Gender and Health, ongoing discussions by the Scientific Director with CANMED, an organization dedicated to depressive illness, and other commendable attempts to calculate the economic impact of mental health disorders (Project Retrosite). However, despite INMHA helping to establish the Mental Health Commission, and subsequent discussions, there has been no further obvious collaboration between INMHA and that body.

Collaborative research outcomes with industry have been opportunistic, for example in terms of part-funded chairs and with medical device companies, effectively in collaboration with other partners such as NSERC. Biotech companies such as NeuroMed Pharmaceuticals (now CombinatoRx) had resulted from basic biomedical research funded by CIHR. However, collaboration with big Pharma has been limited, partly perhaps due to the centre of executive gravity of such global organizations not being in Canada. Some initiatives had been forged, for example, with AstraZeneca, INMHA co-funded the Biology of Pain Young Investigator's Grants and the Neurobiology of Psychiatric Disorders and Addiction Program, and with Lundbeck, INMHA has just launched a post-doctoral fellowship program in Alzheimer's disease. However, there had apparently been insufficient detailed feedback to some of the big Pharma sponsors about the outcomes (although the programs were perceived to have been successful). Whilst Pfizer was represented on the IAB, there had perhaps been insufficient proactive approach to companies to present the strengths of basic Canadian neuroscience and the potential for collaborative research that would be welcomed in the current climate. It was recognised that there were intellectual property issues that would have to be carefully negotiated.

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

Overall, it had been difficult for the Panel to evaluate in full outcomes relevant to INMHA. The bibliometric measures were significant and impressive, although it would have been useful also to have comparative indices for other specific areas such as mental health, addiction and neurodegenerative disorders, in addition to that of pain. There was evidence of considerable enterprise and imagination in forging new initiatives and partnerships - and several of these appeared to be very far-sighted and exciting, such as the China-Canada partnership and the Epigenetics Initiative. However, the success of the training program had not been fully documented and perhaps inevitably, delivery of clinical and mental health benefits and outcomes was not so evident. In general, the CIHR Strategy for Patient-Oriented Research, although admirable in concept and generally endorsed in principle, was not yet felt to be delivering the outcomes for INMHA that it undoubtedly envisages. “There had been many accomplishments but the message was not getting out”.

Section 5 - Achieving the Institute mandate

The mandate of INMHA is “to support research that enhances the knowledge of the brain, mental health…vision, hearing and cognitive functioning”. Furthermore “we will improve the understanding of human thought, emotion, behaviour, sensation, perception, learning and memory”. Based on the available evidence, the Panel is confident that these parts of the mandate are being amply fulfilled with the aid of imaginative leadership. The goal of INMHA in reducing “the burden of brain illness, through prevention strategies, screening, diagnosis, treatment, support systems and palliation” is a much more difficult one to attain, although INMHA is making some progress in establishing the necessary bedrock of research in basic neuroscience and appreciating its connections to the clinic. Some groundwork in the understanding of mental health disorders is also being laid, in readiness for opportunities for translation, but it is unclear at present if the present clinical and health services infrastructure, partnerships and cadre of available clinical researchers will be sufficient to meet the ultimate tests of ‘in principle’ experimental medicine and Phase 3 clinical trials. It was accepted by the Panel that achieving the necessary balance of resource to support basic advances in anticipation of clinical application was a difficult problem.

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

Overall, the impression was that considerable progress had been made by INMHA in harnessing resources to advance neuroscience and mental health research and thus achieve its own mandate. However, the Strategy for Patient-Oriented Research needed now to ‘kick on’ from its landmark surveys of mental health in Canada and engage more proactively with potential stakeholders. It was possible that the area still suffered from ‘institutional stigma’ despite these efforts, and this urgently needed to be redressed.

Section 6 - ERT Observations & Recommendations

1. INMHA should take steps to enhance communications and public relations with INMHA investigators and stakeholders, in terms of feedback and user-friendly information about funding schemes (as well as possibly its operating grant application success, although it is recognised that this scheme is independent of INMHA). The present system with one communications officer deployed to INMHA from an overall team of about 10 within CIHR appears far from optimal and leads to damaging misperceptions. The fact that the INMHA website evidently needs updating may be symptomatic of this. This lack of communications infrastructure for INMHA also considerably diminishes the visibility and specific public relations performance of INMHA to adversely affect its political effectiveness in a range of contexts, including Government (although it is realised that some relevant activity is presently largely undertaken by the CIHR Scientific Council).

2. More consultancy by INMHA is required to build bridges with stake-holders with the aim of delivering joint action plans in the context of mental health/health services research and industrial collaborations. Greater consultancy with stakeholders and investigators alike would also allow the workings of the IAB to become more transparent to the scientific and health services communities. Membership of this Committee should be reviewed regularly to involve a large number of stake-holders, which should also probably meet more regularly.

3. Adopting active partnerships and networking with organizations such as NIDA and ADNE to enable large clinical trials.

4. Review strategy for mental health and addiction research, including training of clinician-scientists, and relationships with mental health organizations and services. Possible introduction of Career Development Awards or a similar scheme for young physicians who have been inspired by scientific curiosity and suitable role models for translational research.

5. Take pains to communicate outcomes of INMHA collaborations with Pharma and Biotechs to these partners in order to enhance the opportunities for further partnership.

6. Review strategy for maintaining continuity of effective and successful research teams.

7. Urgently address career destinations and achievements of the pre-doctoral and post-doctoral training programs.

8. Review assessment of grant applications (this being a more general CIHR problem), in terms of volume and difficulties of obtaining good peer reviews (possible incentives for the latter also need to be considered).

Appendix 1 - Expert Review Team

Chair - Professor T W Robbins
Professor of Cognitive Neuroscience
Chair of Experimental Psychology
University of Cambridge, UK

Expert Reviewer – Professor Charles P. O'Brien
Kenneth Appel Professor, University of Pennsylvania
Vice Director of the Institute of Neurological Sciences
Director of the Center for Studies of Addiction
University of Pennsylvania, USA

International Review Panel – Dr. Marie-Francoise Chesselet
Charles H. Markham Professor of Neurology
Chair of the Department of Neurobiology
David Geffen School of Medicine
University of California Los Angeles, USA

Appendix 2 - Key Informants

Session 1 – Review of Institute

1. **Dr. Anthony Phillips, INMHA Scientific Director**

2. **Dr. Ravi Menon, Chair – Institute Advisory Board**
   Professor, Medical Biophysics, Diagnostic Radiology & Nuclear Medicine, Neuroscience, Biomedical Engineering, and Psychiatry
   University of Western Ontario

3. **Dr. Roberta Palmour**
   Professor, Department of Psychiatry
   McGill University

4. **Dr. Samuel Weiss**
   Director, Hotchkiss Brain Institute
   Professor, Department of Cell Biology & Anatomy/Pharmacology & Therapeutics
   University of Calgary

Session 2 – Consultation with researchers

1. **Dr. Adriana Di Polo**
   Associate Professor, Faculty of Medicine, Department of Pathology and Cell Biology
   Université de Montréal

2. **Dr. Glenda MacQueen**
   Professor and Head, Department of Psychiatry
   Faculty of Medicine
   University of Calgary

3. **Dr. A. Jonathan Stoessl**
   Director, Pacific Parkinson's Research Centre
   Professor and Acting Division Head, Faculty of Medicine, Division of Neurology
   University of British Columbia

Session 3 – Roundtable with stakeholders

1. **Dr. Alain Gendron**
   Medical Advisor, AstraZeneca Inc.

2. **Mr. Philip Upshall**
   National Executive Director, Mood Disorders Society of Canada

3. **Dr. Jane Hood**
   Director, Research & Knowledge Development
   British Columbia Mental Health and Addictions Research Network

4. **Dr. Denise Figlewicz**
   Vice-President of Research, ALS Society of Canada