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Ottawa, November 8th, 2016

"The Role of Early Career Scientists in Research Policy Development".

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Dr. Aubie Angel

Dr. Aubie Angel CM., MD, MSc, FRCPC, FCAHS,
President of Friends of CIHR

Welcome, friends and colleagues, scientists, media and others. So glad you are here today. I am Aubie Angel, President of Friends of CIHR and Chair of the Friesen Prize Advisory Committee. I am honoured to be here as part of a collaboration, integrating an event of the Friesen program with CSPC 2016 in the hope that we can inform policy discussions about health, health research and science. So I thank Mehrdad Hariri for inviting Friends of CIHR to participate and for being such a generous host. I am also delighted to acknowledge our like-minded co-hosts the Banting Research Foundation and the Royal Canadian Institute for Science. Friends of CIHR is grateful for their financial support and active planning of this event.

For the past couple of days, we have enjoyed excellent discussions honouring Dr. Janet Rossant, the 2016 Henry G. Friesen Prizewinner. Dr. Rossant, thank you for gracing the occasion and participating in all of the events. We have been discussing a variety of interesting themes: regenerative medicine, ethical issues in stem cell science, innovation, support of young people. Today's roundtable is particularly relevant because we are addressing the role of early career scientists in policy development.

These Roundtables are a new venture with a policy focus and enhance our gatherings as we promote science excellence and leadership in medicine.

It is a pleasure to introduce Minister Reza Moridi to say a few words of welcome. He is an Award-winning scientist, engineer, educator, business leader and community activist. Minister Moridi worked as CEO and Chair in the electrical industry. His career in academia is noteworthy, having served as the Dean of the College of Sciences and Chair of the Physics department and University Chief Librarian and Member of Senate at Alzahra University in Tehran. There is no one as well qualified as Minister Moridi, as an academic, as a scientist, and as an advocate for youth and research in the country.

Best Wishes for a successful Roundtable.

Dr. Aubie Angel, President, FCIHR

Messages From the Presenting Organizations

Mr. Peter Love

President of the Royal Canadian Institute for Science

I have the honour of having being the 114th President of the Royal Canadian Institute for Science. The oldest scientific society in Canada, our mission is simple – we provide a platform for public engagement with prominent Canadian and international scientists through free live lectures, events and webcasts. As Canada's oldest scientific society, we are pleased to partner on this important forum on research in Canada.

Dr. Catherine Whiteside

Dr. Catharine Whiteside. CM, MD, PhD, FRCPC, FCAHS President, Banting Research Foundation

Established to commemorate the discovery of insulin and to provide opportunity for other Canadian investigators to make discoveries "which, like insulin, will bring alleviation to human suffering", the Banting Research Foundation has fostered medical research across Canada for over 90 years. Once the country's only such granting agency, the Foundation's present focus is to support innovative projects proposed by outstanding investigators within the first three years of their initial appointment to a Canadian University or Research Institute. It is in this spirit that the Banting Research Foundation has partnered with the Royal Canadian Institute for Science and the Friends of the CIHR to support the 2016 Henry J. Friesen International Prize Program and its expert roundtable discussions informing the contribution of discovery science and graduate programs to the health of all Canadians.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Co-Chairs

Dr. Catherine Whiteside

Dr. Catharine Whiteside. CM, MD, PhD, FRCPC, FCAHS
President, Banting Research Foundation

Chair, Banting Research Foundation Board of Trustees. Graduate of the University of Toronto and FRCP(C) in Internal Medicine and Nephrology. Staff nephrologist at the University Health Network, Toronto, and clinician-scientist in the Department of Medicine. Formerly, Associate Dean Graduate and Inter-Faculty Affairs in the Faculty of Medicine and Dean of Medicine and Vice Provost Relations with Health Care Institutions at the University of Toronto. Winner of the WXN Canada's Most Powerful Women Top 100 Award, the Medal for Research Excellence from the Kidney Foundation of Canada, the Canadian Medical Association 2009 May Cohen Award for Women Mentors and the OMA's Advocate for Students and Residents Award. Dr. Whiteside holds an Honorary Fellowship in the College of Family Physicians of Canada. She is a founding member and past President of the Canadian Academy of Health Sciences and currently serves as a Director on the Board of The Scarborough Hospital Foundation. In 2016, she was appointed as a Member of the Order of Canada.

Mr. Paul Davidson

Mr. Paul Davidson, BA, MA
President Universities Canada

Universities Canada. Paul Davidson has played leadership roles in government, the private sector and the voluntary sector for over 25 years. At Universities Canada, he has led a process of organizational renewal and greater member engagement, achieving increases in research funding, resources for campus internationalization and increased attention to issues of access and success for aboriginal students. Named both a "top lobbyist" in Ottawa and a "top foreign policy influencer," prior to joining Universities Canada, Mr. Davidson was the executive director of World University Service of Canada (WUSC) a leading international development agency active across Canada overseas. Mr. Davidson also held senior positions in Canadian book publishing and led the Toronto office of a prominent government relations firm. Mr. Davidson holds an MA from Queen's University and a BA from Trent University.

Introductory Comments by Co-Chair Mr. Paul Davidson

P. Davidson: How great to be with you this afternoon. It's always great to Co-Chair something with Cathy. Cathy and I have known each other for over 20 years. And Reinhart and I have known each other longer than that. So it's great to be amongst friends. It's great to be amongst colleagues to discuss a really important subject. Right now, I'm going to ask the next 4 panellists to come forward to take a place on the dais.

While they are coming forward, let me just make some remarks about how timely this panel is. You know, a year ago when we got together, it was just after the election and there was some giddy euphoria about the possibilities that might present. Since then, we've had a Budget that had the largest investment in Discovery Research in over a decade. We've had a Federal investment of over 2 billion dollars in research infrastructure. And we've had a number of initiatives to make post-secondary education more accessible for students.

But more important and more relevant to this subject today is that there are over 150 Federal consultations under way right now. Earlier, it was mentioned the Science Policy Review and that's just one of the big 3 that Universities Canada is tracking. There is also Dominic Barton's Review, the Economic Advisory Council, which is charting a 10-year plan for Canada's economic strategy. And there is, of course, the Innovation Agenda, which is tightly linked to the other two studies. But those are just the top 3 of over 150 consultations that are underway. And in each of those consultations, there is a desperate hunger for evidence-based, expert-driven policy advice. The window is open.

But that's not the only thing that's changed in Ottawa over the past 12 months. Cabinet had not yet formed when we last gathered. But within the House of Commons, the new House of Commons, the new Parliament, we have 44 new MPs, who are under the age of 40. And we have 25 fewer MPs over the age of 60. So this is a young person's town. There has been a generational shift in Ottawa. And the policy community needs to realize that.

It extends into Cabinet. Amongst the Cabinet, you will be pleased to know that 27 of 31 have a university background, including a number of active scientists. And the average age of Cabinet is just 44. As we said last year during some of our advocacy, you can become Prime Minister in Canada before you get your first CIHR grant. Think about it. And think about the composition of this room and how we draw in a new generation of evidence-based advocates for Science.

Now I am pleased to say that there is also in this environment a real ambition. A recognition that we have achieved great things over the last 20 years, but we've got some great things to do yet. And as we look forward to Canada's sesquicentennial, 150th

anniversary, let's think of "Generation Next", "Generation 2017" and what kind of experiences we will be giving them. Because the investments that we make in those people today will determine Canada's prosperity in the next 50 years.

So, as people have settled in, it's my great pleasure now to introduce a very accomplished group. Now because their bios have been circulated, I'm going to be very quick on this and ask Dr. Norman Rosenblum, who is Associate Dean of Physician Scientist Training at U of T, to speak about "Promoting Agency Among Young Investigators Towards Health Research Policy Development".

Massey College, University of Toronto

Home of F.C.I.H.R.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Honorary Chair

The Hon.
Minister Reza Moridi

The Honourable Dr. Reza Moridi, PhD
Minister of Research and Innovation, Government of Ontario

Minister of Research and Innovation, Minister of Training, Colleges and Universities. The Hon. Dr. Reza Moridi has served as the Parliamentary Assistant to the Minister of Training, Colleges and Universities, the Minister of Research and Innovation and the Minister of Energy. He is an award-winning scientist, engineer, educator, business leader and community activist. Minister Moridi worked as a CEO and Chair in the electrical industry and his career in academia included serving as the Dean of the School of Sciences, Chair of the Physics Department, University Chief Librarian and member of the Senate at Alzahra University in Tehran. Dr. Moridi was the Vice-President and Chief Scientist at the Radiation Safety Institute of Canada. He received the Education and Communication Award from the Canadian Nuclear Society and the Fellow Award from the US Health Physics Society. He was elected as a Fellow of the UK Institute of Physics and the UK Institution of Engineering and Technology for his original contribution to physics and engineering.

" Sowing Seeds for a Stronger Science Future: How Ontario Supports Early Career Researchers"

Minister Reza Moridi: Well, thank you very much, Aubie, for that gracious introduction. Good afternoon, ladies and gentlemen. It's a distinct pleasure for me to join you this afternoon, as the Honorary Chair of this Roundtable.

I owe this pleasure today to the Friends of Canadian Institutes of Health Research for the kind invitation every year and of course, what an honour it is to have Dr. Janet Rossant with us this afternoon, the 2016 Henry G. Friesen Prizewinner. Janet is an exceptional researcher, scientist, academic, science advocate and policymaker.

I also want to acknowledge Dr. Henry Friesen, the inspiration behind this Prize. Dr. Friesen, your distinguished leadership, vision and innovative contributions to health research and health research policy have been remarkable.

Ladies and gentlemen: Ontario has a flourishing history of health innovation. And our Government knows that to cultivate an environment enriched with new ideas and more scientific breakthroughs, we need to continue supporting our early researcher careers. That's why the Ontario Government has awarded over 900 Early Researcher Awards for the past 10 years. This program is a key part of nurturing and attracting

top talents to Ontario – it helps promising researchers build their own research teams and train the next generation of scientists and researchers. Over 31,000 highly qualified researchers have received opportunities to enhance their knowledge, training and skills through this program.

Another flagship initiative of Ontario is "The Ontario Research Fund", supporting state-of-the-art and industry-relevant infrastructure projects. Again, in the past 10 years, we have committed more than $1.5 billion dollars through this program, supporting over 2,400 research projects and helping over 100,000 researchers to enhance their knowledge, experience and skills. And this $1.5 billion dollars are investments on the part of Ontario Government that has helped leverage $3.5 billion dollars from other sources to [fund] research projects in the province of Ontario. Through these investments in research, our province of Ontario continues to build the best-educated, the best-trained workforce in the world with a focus on fostering and attracting world-class researchers and scientists to Ontario.

Our Government wants to continue to create an environment rich with opportunity, where our researchers can make more groundbreaking discoveries that drive innovation, leading to new technologies, new treatments for patients and more advances in science.

I look to everyone in this room to help us as we work together to grow Ontario's research capacity. And I am certain that today's discussion will produce great things for the future.

Thank you very much. Merci beaucoup.

Question and Answer Discussion Period With the Audience

GENERAL COMMENTS – EARLY CAREER SCIENTISTS

Minister Moridi: As I was thinking about early researchers' careers, it occurred to me a few examples from my own field of Physics. I just want to mention the significance of early scientists and young scientists who have made an enormous impact in science and research in our time actually, and of course, in the last century. A good example is Albert Einstein. I mean, he was very young when he came up with the "Theory of Relativity". He was about 22 or 23 years old. And he didn't have a PhD, by the way. And then, of course, that theory changed the whole world. And another thing is that 60% of the light coming out of here in this room comes as the result of his "Theory of Relativity".

And then again, you consider, for example, another person like Louis de Broglie, who was a prince, a French prince, that at the age of 22, I think or 23, for his PhD thesis, he came up with the concept of "duality", the particle duality. So that has also changed the whole world. One of the basis of Quantum Theory is his fundamental thinking.

There are so many examples in Science. These are just in Physics and in Mathematics, as well, for example. So what I'm trying to get at is that many major fundamental basic discoveries in Science, as far as in Physics as I'm considering, Madame Curie, for example. There are many. These happened [at an] early age, before they were maybe 30 years old. So, I think we need as a country, as a province, as a nation, we need to pay more attention to early researchers, early researchers' careers, young scientists basically.

And we haven't done that really, in the way that we should have. In Ontario, we have created, as I mentioned in my early remarks, "The Early Researcher Award" and that's about $100,000 and so on, and so forth. And we have given about 900 [awards] to recipients. And I did a bit of a calculation and it

came out to about $100 million, a little less than $100 million in the past 10 years. And then you compare this to “The Ontario Research Fund”, where we invested $1.5 billion, 15 times more.

So that is, I think this is something we need to do more of. Lou Siminovitch came to see me about several months ago and a few people and we discussed this quite significantly in depth. And I’ve been talking to my Deputy in the Ministry to see how we can attend to this deficiency of which we have in our policy. We need to, of course, invest in “Big Science”. You know, laboratories such as the SNOLAB or Canadian Light Source and so on, and so forth.

But in the meantime, we need to provide resources to young scientists who can explore, and push the boundaries.

The other point, again, is employment, which came out in various conversations here. That people who are doing PhDs here, want to become mainly academics. That is the intention mainly. And of course, they want to go on to do research in industry and elsewhere. In our system, with this so-called “tenure”, there is a problem. And when I was Minister of Training, Colleges and Universities, last June, as many of you know, I had lots of conversations with my two Deputies. How, as a government, as an institution, as a university, how are they going to create new positions for new people?

So we need to find a solution to this so-called, “tenure”. How can we open our academic institutions to young people? Of course, older people like myself, we carry some experience, that’s for sure, or wisdom. But in the meantime, we don’t have that energy of those aged 20, 25, or 30. We need to do that as well. So I think there are a couple of things we need to do in order to address that question. And it’s a major issue, by the way. [...]I’m glad that Aubie Angel, you have chosen this as the theme for this Roundtable because this is something very important and significant for our research and our Science creation, knowledge creation in our country. And its impact on our economy is quite significant.

One of the issues we have been facing is that the University Presidents came to see me, when I was the Minister for TCU, and said that ‘we can’t fill out our PhD positions with our own students’. Because Canadian graduates, they don’t want to do PhDs. We have spots which we can’t fill. So I said, ‘well, how can you fill this?’. And they said, ‘well, if you allow us to recruit students from other countries, then we will be able to fill these spots and if we don’t do it, in fact, it is going to impact our research capacity and our research excellence in the future’. Because PhD students, are major ingredients of research and innovation in our academic institutions. So, I took a proposal to the Cabinet and fortunately, it was passed. We have the authority for universities to recruit 25% of their capacity from other countries. So that may help a bit. As Janet Rossant and I were discussing, last evening, Some of the foreign students may stay in Canada and some will go back to their home countries. But we need to educate and train our own young people, as well.

In the meantime, we need to attract talent from wherever we can around the world. So, I think these are some of the points that I wanted to share with you.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Keynote Comment:

Dr. Bruce McManus

Dr. Bruce McManus MD, PhD, FRCPC, FRSC, FCAHS
CEO, PROOF Centre of Excellence, UBC-PHC

Bruce McManus, CM,PhD,FRSC,FCAHS, is a professor, department of Pathology and Laboratory Medicine, University of British Columbia (UBC). He serves as CEO centre of excellence for Prevention of Organ Failure (PROOF Centre), and as Co-Director, institute for Heart + Lung Health. He is a senior scientist in the UBC James Hogg Research Centre. Dr. McManus recieved BA and MD degrees (University of Saskatchewan), and MSc (Pennsylvania State University), and the PhD (University of Toledo). Dr. McManus joined the Faculty of Medicine, University of British Columbia, as department Head of Pathology and Labaratory Medicine in 1993. He served as inaugural Scientific Director of the Institute of Circulatory and Respiratory Health, Canadian Institutes of Health Research from 2000-2006. Dr. McManus' investigative passion relates to mechanisms, consequences,detection, and prevention of injury and aberrant repair in inflamatory diseases of heart and blood vessels. He has mentored many faculty and trainees and has convened many public-private partnerships.

Science Ambience, Early Career Scientists, Science Policy Engagement

Science Ambience

In reflecting on Canada's opportunity to empower the emerging generation or two of scientists across the spectrum of inquiry, it is worth remembering the bedrock of our scientific ambience. Every year on October 5th since 1994, there is a celebration of World Teacher's Day. While not all celebrated pedagogy in schools of the world relates to the sciences, much is! From the science of music, astronomy, geology, meteorology, mathematics, physics and chemistry, to the mysteries of microbes and humans and all other fauna and flora in between, the science teachers on this Earth find ways to teach, stimulate and envigorate original thought about the how's, what's, where's and when's of the imagination. Occasionally, these critical wellsprings of scientific curiosity will reach into the epistemology of science, touching on the fascinating connectivity between science and society. Science policy sits at this intersection!

From coast to coast in Canada, the Canadian Association of Science Centres, Youth Science Canada, Let's Talk Science, Sanofi Biogenius Canada, and the Canada-Wide Science Festival, among other organizations and science programs, have been fostering the development of young minds in STEAM – Science, Technology, Engineering, Arts and Mathematics. Without this national set of resources as well as the Science Teachers Associations in each province, a discussion about "early career investigators" at the post-graduate level would be moot.

As we consider the relationships between and opportunities for scientists to engage in science policy education and careers, we should emphasize one centrepiece principle. That principle relates to the

desire to pursue great science! As such, a foundational premise of the need for engagement in a range of science policy issues is that we are focusing on great science, conducted by great scientists (regardless of the stage of their careers or their particular disciplines). We must, through vehicles like "discovery science" curricula, prepare young stars to drive great science and to think about science policy in that context. Role models for and exemplars of great science exist everywhere, not the least of which might be Nobel Laureates and "fathers and mothers" of various scientific fields. So the approach to questions or unknowns taken by brilliant scientists will help to contextualize not only our science but our thoughts about science policy. How did Benjamin Franklin, Wernher von Braun, Barbara McClintock, Henrietta Swan Leavitt, James Lovelock and Richard Feynman think and act on scientific conundrums? What impact did science policy have on them? What is different in our current scientific and policy environment?

Another dimension of our scientific ambience that markedly impacts our science and our perspective of science policy arises from an emergent understanding of how complex systems govern the biology, sociology, meteorology, hydrology and other facets of our world and our health status in it. Thus, we do need to be thinking about systems (molecular), within systems (cellular), within systems (tissues and organs), within systems (whole organisms), within systems (psycho-social networks, within systems (societal contexts), within systems (health care), within systems (political-economic). Similarly, we need to be thinking about how society shapes science and how science shapes society. These systems are variants of fractals with non-linear dynamics – the opportunities from a science policy point of view are similarly couched in such relatedness that is dynamic.

Canada's scientific ambience is not all rosy. A few relatively recent metrics are a bit sobering and yet inspiring to do better! We were ranked 4th for scientific research in 2012, 1st in scientific literacy in 2014, but 13th in school age mathematics competence in 2013 and 15th on the Global Innovation Index in 2016. We discover but do not innovate with the same effectiveness! What science policies need modification to facilitate such translation? Some answers may arise in the soon to be released Fundamental Science Review conducted under the auspices of the Federal Ministry of Science. We will learn more about our gaps in research funding and also what we can emulate about the strategies/policies for funding science in other countries.

Early Career Scientists

There is a reality and perhaps an amplified perception that early-career scientists are drastically short on grant opportunities, on positions and on the time to chase solutions to pressing or magnetic questions. Pressure to publish also appears to be eroding the ability of new scientists to delve to the necessary depth to really answer questions, rather than just far enough to have a publishable story to tell. Using the PhD degree as the end-point metric, there are many new PhD's being awarded, but without a commensurate increase in public sector academic positions. Start-up funding is sparse or insufficient to get early-career scientists on their competitive feet at many institutions. It is not clear that the right local mentors and role models are available or sufficiently evident for some of the new generation of scientists to follow or from which to gain courage and strategies for achieving professional stability and success. The biggest challenges are prioritized by early-career rising star scientists as overly competitive funding environment, pressure to publish, professional insecurity, the "two-body" problem of spouses pursuing intense professional careers, working across disciplines, finding great trainees, daring to fail and finding time to continue to learn. Perseverance and passion are essential.

Science Policy Engagement

Despite the hurdles and challenges facing early career scientists, there are many reasons to be more optimistic about careers and contributions to be made. Beyond a range of exploding domains of research in academic institutions in which new investigators can forge homes and marvelous careers, and the opportunities in related industry settings, there are enormous chances to make a difference in the not-for-profit and governmental sectors. Making a difference in the latter venues requires mentoring and education regarding policy cycles, typically gained through policy fellowship programs. Opportunities to blend strong preparation in science with strong preparation in science and technology policy as a career springboard are accelerating in Canada.

There are models on which to build. South of our border, the American Association for Advancement of Science (AAAS) began 44 years ago funding the AAAS Science & Technology Policy Fellowships. To date, over 3,000 fellows have been prepared through this program. The demand for such fellows in the public and private sectors continues to expand. With this kind of legacy program and others internationally, Canada has been making its own strides. Exemplars are the LIBER ERO Fellowship Program aimed at developing post-doctoral professionals to conduct and communicate research that informs applied conservation and management of Canada's biodiversity. Such fellows are addressing science-policy barriers and opportunities for early-career scientists including a re-balance of the research funding balance sheet, support for life-stage transitions and career development, and enhancing diversity in research representation. Indeed, recently the Honourable Kristy Duncan announced the first CSPC Science Policy Award of Excellence Youth Category. Many more such awards are needed and will allow the convergence of scientific thought and public policy issues to progress in our country. We are a bit behind in this respect.

All of our efforts to further science, to advance scientific careers, and to make progress in the improvement of society through the appropriate and powerful harnessing and connecting of a full range of sciences can be augmented by participation in the global movements that have the same purposes. Several such organizations, some of which are more focused on developing countries and opportunities for new scientists and some of which are more broadly focused provide a medium by which learnings and shared purpose can be suffused around the world. This troubled society needs as much progressive cross-fertilization as possible and as soon as possible. As such, the World Science Forums have been convened most recently by the mutually aligned efforts of the World Association of Young Scientists, the InterAcademy Partnership, UNESCO, the International Consortium of Research Staff Associations and the Global Young Academy. There is much power of thought and action for good to be realized from these international efforts. Canadians must be at the table, and vigorously so.

Postscript

We live in a time of great promise and great risk. We need all people engaged in preparing and clearing paths for brilliant young scientists and for those who see the impact that a scientific base can provide for societal good when couched in strong understanding of the complexities of policies. This understanding should not be inward looking at the early-career scientists themselves, but also more so in terms of the health of the societies we all inhabit. In this context the wisdom of Louis Pasteur may be germane – "You bring me the deepest joy that can be felt by a man whose invincible belief is that Science and Peace will triumph over Ignorance and War, that nations will unite, not to destroy, but to build, and that the future will belong to those who will have done most for suffering humanity".

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Reinhart Reithmeier

Dr. Reinhart Reithmeier, PhD, FCAH
Special Advisor to Dean of Graduate Studies, University of Toronto.

Dr. Reithmeier is known internationally for his research on anion transport membrane proteins in human health and disease. An award-winning lecturer and graduate mentor, Dr. Reithmeier enjoys teaching introductory biochemistry to over 1,000 undergraduate students every year, as well as upper level and graduate courses. As former Chair of Biochemistry and a Special Advisor to the Dean of Graduate Studies on Graduate Skills Development and Engagement, Dr. Reithmeier is dedicated to ensuring that graduate students have the skill set and network to succeed in graduate school and be fully prepared to take advantage of the diverse job opportunities available to them in today's global marketplace. His leadership was recognized in 2012 by election to the Canadian Academy of Health Sciences.

"Empowering Graduate Students To Develop Their Pathways to Success".

I'd like to make two points in this panel discussion, which are directed at empowering graduate students to develop their pathways to success.

The first is the importance of embedding professional development as an integral part of graduate programs.

The second is to change the way we fund trainees by providing block training grants and more individual awards.

The majority of PhDs graduating today will not become research professors. Yet, we still use an outmoded apprenticeship model that trains graduate students and post-doctoral fellows to replicate ourselves.

U of T has launched a 10,000 PhD Project to determine the current employment positions of the 10,886 individuals across all disciplines that graduated between 2000 and 2015. The data obtained to date indicate that about 15-20% of recent life sciences graduates become professors, down from some 30% ten years ago. This is in part due to enrolment expansion and stagnation in the number of open faculty positions.

The good news is that a growing number -about 15-20% of life sciences graduates - now go into the private sector. Most obtain top positions in biotech and pharma, some directly from their PhD. The

well-trodden path to a post-doctoral fellowship is becoming plan B. Others find employment as research leaders in the Post-Secondary Education and public sectors. Some become entrepreneurs. Some even become cabinet ministers. The outcome data clearly show that PhDs are making contributions in all employment sectors in academia and beyond.

The transition from the academy to the workplace for some PhDs is however difficult. Students who can communicate their passion for science to the non-expert, who can covert their cv to a resume, who can make cold calls and informational interviews and who can build their professional network are well positioned to take advantage of the diverse career opportunities within academia and beyond.

Research imparts many high level skills beyond the technical - problem solving, critical analysis, communication, time management, working as an effective member of a team and leadership- all transferable skills.

Students need to develop their own Individual Development Plan or IDP, as required by NIH-funded trainees in the US. And, they should be able to openly discuss this plan with their supervisor and provide annual updates. Graduate students need to be able to clearly articulate their career plans and modify and adapt them as they progress in their graduate training.

Graduate students also need to develop a professional network and find mentors beyond their supervisor. A good place to start is with alumni from their own graduate unit, department or research institute.

So, to take advantage of diverse career opportunities, graduate students need to develop their transferable skills and build their professional network, and they need to do this while they are in graduate school.

One way to ensure that professional development is an integral part of graduate experience is to provide block training grants. These grants would be awarded to institutions and programs that create innovative training environments that promote interaction and collaboration and that include professional development and experiential learning.

Our funding agencies should provide more studentships and fellowships to top candidates and the candidates should be able to choose their own supervisors and projects. The award is tied to the quality and potential of the individual rather than the project or potential supervisor. It is based on an excellent academic record, a demonstrated interest in research, strong letters of reference and leadership potential. Students bringing their own funding will help change the supervisor-student dynamic. The graduate student will also get direct recognition for the award, which will enhance their cv or résumé.

In conclusion, more independent funding and enhancing professional development will help empower graduate students to develop successful and diverse career paths.

Roundtable

"The Role of Early Career Scientists in Research Policy Development".

Panel Presenter

Dr. Danika Goosney

Dr. Danika Goosney, PhD
Director General, Science Strategies and Initiatives, CIHR

Director General, Science Strategies and Initiatives, Canadian Institutes of Health Research. Dr. Goosney's doctoral dissertation garnered the Governor General's Gold Medal and the Cangene Canadian Graduate Student Microbiologist of the Year. She conducted her postdoctoral training as a CIHR Postdoctoral Fellow in the Department of Immunology at the Scripps Research Institute in La Jolla, California. Following her postdoctoral research, she pursued a career as a research scientist at two Vancouver-based biotechnology companies. She has held several key Director positions within the Research, Knowledge Translation and Ethics Portfolio at CIHR. In 2015, she was named one of Canada's emerging leaders as a member of the Governor General's Canadian Leadership Conference. She currently serves as a member of CIHR's Science Council and the Standing Committee on Ethics, and is co-chair of the Subcommittee on Implementation and Oversight. She is a passionate mentor for graduate students and postdoctoral fellows looking to pursue academic and non-academic careers.

"CIHR'S Perspective "

- Evidence-based policy development is fundamental at all levels, and high-quality research will need to be harnessed to address critical issues facing humanity.
- Encouraging all researchers, especially early career investigators (ECIs), to participate in policy development is vital for the success of the health research enterprise in Canada and abroad.
- The focus on encouraging ECIs to contribute to science policy development and implementation makes sense:

ECIs bring fresh ideas and perspectives

Because ECIs are focused on establishing themselves as experts in their fields, they are more likely to pursue creative research projects and perform more innovative and high-risk/high-impact work, and are also able to encourage mid and senior career investigators to do the same (established investigators are more likely to publish in more novel areas when they are mentoring ECIs).

ECIs are more likely to partner with diverse stakeholders (e.g. industry, law, policy, patients, community members, etc.), which increases the pace of discovery and increases innovative work by

using scientific approaches to tackle important societal issues. Also, by ensuring the participation of diverse stakeholder groups, policies more accurately reflect contextual issues/problems.

- As a federal research funder, CIHR has a role to play in helping ECIs find their voice. We can do this by:

Supporting education, training, and awareness related to the importance of contributing to policy, how to work with policy makers, etc. through graduate and postgraduate education. CIHR's new strategic action plan on training describes the additional skills research leaders will require to be successful in today's landscape, including policy development requirements, which will be addressed through a variety of actions (training modules, experiential learning opportunities in policy shops [e.g. IHSPR's new Start-up grant for postdoc who want to do a year of training within a policy field], to name a few).

Giving ECIs a place at the CIHR policy table

Profiling policy success stories of ECIs (e.g. KT Impact stories and Health Research in Action)

Working with ECIs on various policy topics (e.g. equity and gender/career stage). CIHR has staff dedicated to the betterment of health research, focusing on ethics, knowledge translation, big data, equity, SGBA, and training, to name a few. We would love to work with (and indeed, need to work with) ECIs to make health research in Canada the best in the world.

Acting as a liaison between the research community and other federal (and provincial) departments that require research to inform policy decisions.

- Awareness within the research community of why/how to influence policy is crucial to change the culture to one where it is expected that researchers are major players in policy development, and that their contribution is valued. ECIs can influence policy in a number of ways:

    Through their research

    Through research work in collaboration with federal or provincial departments

    Through advocacy and lobbying

    There are major policy hurdles still to overcome that require researchers to use their rigorous scientific methods to produce evidence-based solutions:

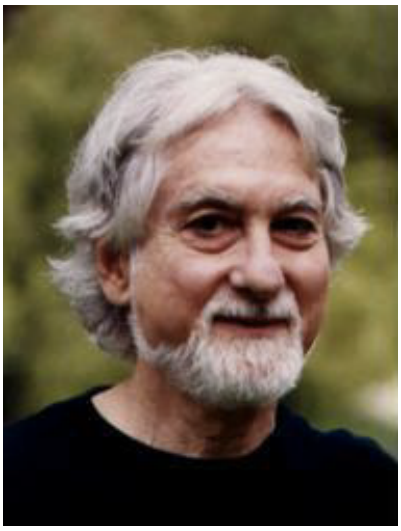
    Upcoming health issues: e.g. vaping, marijuana, clean energy

Ongoing research issues: equity in research (gender, career stage, etc.), data reproducibility, publishing negative data, lack of funding/job security, etc.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter



Dr. Morley Hollenberg

Dr. Morley Hollenberg, D Phil, MD, FRSC Professor, Department of Physiology and Pharmacology, University of Calgary

Dr. Morley Hollenberg is presently a Professor in the Department of Medicine at the University of Calgary. He completed his Doctoral training as a Rhodes Scholar at Oxford University and his MD at Johns Hopkins School of Medicine, Baltimore. His research interests focus on receptor mechanisms and signal transduction pathways involved in the action of insulin, epidermal growth factor-urogastrone, and other vasoactive agents that can regulate cell growth. He has served as Committee Chair at the Canadian Medical Research Council. His research work to date has led to the publication of 190 refereed manuscripts and over 45 book chapters, and he has served as Editor for two books dealing with insulin, insulin action, and diabetes.

Student Trainees and New Faculty in Health Research Policy Development: The Calgary Approach

Bringing health research policy development into focus: It is fair to say that issues of Health Research Policy have been well below the radar for many new faculty members and their trainees, particularly in the biomedical sciences in our University of Calgary Medical Faculty. That said, there has been a recent shift in consciousness in our training programmes, and there is now considerable effort within our Faculty, spearheaded by our Department of Community Health Sciences, to engage individuals in the area of Research Policy, bringing this issue into focus and to provide a supportive platform to do so. My perspective is strongly coloured by my role as a Co-Director of our combined MD-MSc-PhD Leaders in Medicine (LIM) programme (http://cumming.ucalgary.ca/lim/) and my day-to-day interactions with recently appointed Faculty members with whom I collaborate in our Inflammation Network Research group (http://www.ucalgary.ca/irn/). It is of relevance that a cornerstone philosophy of our Leaders in Medicine programme is to foster the training of combined degree individuals who will play roles not only in biomedical research but also in other areas like health care delivery, other government-developed health care programmes, international agencies like the World Health Organization and in the pharmaceutical industry. Thus, a full grasp of the elements of health care policy development is an essential component for the future of our trainees. The formula for our approach to bring Health Research Policy development into focus and fostering progress in this area amongst our LIM trainees and new faculty is summed up by three words: Partnership, Agency and Responsibility.

Partnership: We have established a working partnership between our trainees (principally LIM programme members and their MD classmates), our recently appointed faculty and our senior faculty, particularly those in our Department of Community Health Sciences, where there is a focus on developing programmes related to health policy. A key element of this partnership involves the trainee-directed series of sessions dealing with research in progress, translational research, and a newly established series dealing with entrepreneurship and innovation in medical research. For each of these trainee-led events, topics of health policy and management are now on the table and up for

discussion. As partners, both recently appointed and senior Faculty are integral discussants; and by trainee invitation, leaders in the field of research policy, both from within the Faculty and outside present their overviews. The resource to support the partnership is provided by funds available from the Leaders in Medicine programme. Our experience is that by engaging trainees and new Faculty as essential and full partners in the process, success is optimized.

Agency: To grow a partnership that underpins the theme of research policy within the Faculty, we have provided our trainees and Faculty with the agency to provide creative leadership (e.g. the ability to act independently and with authority with Faculty support in a cooperative way). To this end, with oversight provided by our LIM executive, our trainees and associated Faculty have full authority to introduce Faculty-wide events, including visiting speaker engagements. The students, with their Faculty advisors have full authority for the design of the sessions and the choice of topics.

Responsibility with accountability: Having self-identified as individuals with an interest in furthering health policy research development, each team member is expected to assume responsibility for their respective roles (e.g. Faculty advisor; seminar series organizer) and to become fully accountable to the other members of the team for progress in this area. Support for these roles is provided by the executive of the Leaders in Medicine programme, in collaboration with our Department of Community Health sciences.

Implementing the plan: It is only over the past year that the Leaders in Medicine programme has begun to target its trainees in keeping with the above plan. To date, a recently appointed new Faculty member, who is a member of the Canadian Association for Early Career Health Research, has been identified as a resource person/advisor for our MD-PhD-MSc trainees. With that person as a resource, our regular Leaders in Medicine trainee-led seminar series, including a monthly Translational Research Rounds, bi-weekly Research in Progress sessions and a newly established Innovation and entrepreneurship in biomedical research forum is introducing themes relevant to health policy and management into the list of topics covered. To underpin the academic excellence of the trainee-led initiatives, the LIM programme has forged a strategic alliance with our Department of Community Health Sciences. One new initiative of that department is to foster trainee ‘internship’ experiential learning opportunities which will embed individuals in appropriate organizations related to the areas in which we expect some of our Leaders in Medicine programme trainees to function in the future.

To summarize: With the above plan in place, our mission is to 1. Raise awareness about Research Policy and promotion in our new Faculty and trainees, with a special focus on our Leaders in Medicine students, 2. Assign responsibility, with Faculty support, for initiatives led by LIM trainees and New Faculty in this area, 3. Provide advisory input for new faculty and trainees from our LIM executive, in concert with the support of our Department of Community Health Sciences and 4. Provide for an embedded ‘internship’ training experience with funding support relevant to health Policy issues and management both for our Leaders In Medicine and other Faculty trainees. We anticipate that by involving our trainees and new faculty as stakeholders in the process, we will be able to forge new directions in the area of health policy and management in our Faculty, so as to contribute in a unique way nationally in this important area.

1. Footnote: This text summarizes a presentation presented at “Policy Roundtable-2016 Friesen Prize Program”: “The Role of Early Career Scientists in Research Policy Development”,in Collaboration with the Canadian Science Policy Conference (CSPC 2016) Tuesday, November 8th, 2016 Ottawa

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Grant Pierce

Dr. Grant Pierce, PhD, FRCS, FCAHS
Executive Director of Research, St. Boniface Hospital, Winnipeg

Dr Pierce completed postdoctoral training at UCLA before returning to Canada where he is Executive Director of Research at St Boniface Hospital and a Professor of Physiology and Pathophysiology at the University of Manitoba in Winnipeg. He has published over 200 peer reviewed research manuscripts and 7 textbooks on metabolism, nutrition and cardiovascular health. He has been cited over 8000 times with a Google Scholar H index of 53. He just completed a 13-year term as the Editor of the Canadian Journal of Physiology and Pharmacology. He recently received the Queen Elizabeth II Diamond Jubilee Medal for service to Canada and is an elected Fellow of the Royal Society of Canada, the highest distinction for a scientist in Canada.

Promoting Agency Among Young Investigators Towards Health Research Policy Development

Mr Chairman, ladies and gentlemen. I want to address two independent issues during my few minutes here. If I am allowed, I will start with a personal anecdote of my own experience as a young scientist. A long long time ago, when cave men dragged themselves out of caves and the last dinosaur collapsed in Drumheller Alberta, THAT was when I was a Young Investigator. The time I want to focus on was when I was a young scientist at about 15 BC. BC of course refers to Before CIHR. At that same time, Dr Henry Friesen was President of an ancient fabled institution called the Medical Research Council of Canada. I want to assure you young scientists that the MRC was real and it did actually exist. It is not a legend but Dr Friesen is. Dr Friesen was fine tuning the review process and created a national panel to change the MRC policies and procedures around peer review (if they needed changing at all). He included me in an august panel of senior scientists. It was the first time that I had the chance to meet the future 1st President of CIHR, Alan Bernstein as well as many other luminaries on the panel. I was by far the youngest upstart on the panel. We did make several changes to MRC peer review. I am proud to say that I had a significant part to play in changing MRC from one competition per year to the two competition format that was followed afterwards for decades. Participating in this panel for about one year was a significant opportunity for a young investigator. This gave me important insight into peer review, the organization of MRC, how to interact with senior scientists, time to discuss issues with senior experienced superstar scientists, time to realize that I could even disagree and argue with these experts. This is important for one's confidence, knowledge base, experiences that are invaluable to young scientists. I came to realize that wisdom does not always come with age. Unfortunately, the older I become, the more I am acutely aware of this deficiency in myself! Including young investigators in senior policy decisions is critical to not only inject new ideas and fresh slants on science but to provide them with experience as well.

Secondly, on a separate matter, I want to bring up a final point that may or may not be a red herring for our focus point today. However, I think it is one of the most important issues facing young scientists today. I think we will all agree that it is difficult for a young scientist to have an impact on health policy if you do not even have a career as a scientist. You may not be aware but it is getting more and more difficult for young trainees to find a job today as a scientist. It's not because they are not well trained and richly deserving of the opportunity. It's that there are fewer opportunities than ever before. I believe one of the biggest detriments to them gaining employment today is senior scientists. Ten years ago, senior scientists were forced to retire at a set age. Each University was different but all had mandatory retirement ages. Most Universities no longer have this. The result as I see it is that professors are staying in their job much longer than ever before. Who wants to walk away from the largest salaries of their careers? It is great for the senior scientists. The result for young scientists, however, is a lack of openings. It is devastating for these junior scientists. How can we even think about the impact of junior scientists on health policies when they cannot even begin their careers? How can we talk about getting to home plate when these young scientists are not even getting to first base? Somehow, someway, we have to address this unfortunate situation. Funding bodies have all cut back on salary support for young investigators, a major recruiting tool when I was young. Faculty unions back the senior professors to stay put. We need interventions to create opportunity for young scientists to flourish and have an impact on the health care system.

Thank you for the opportunity to speak with you today.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Norman Rosenblum

Dr. Norman Rosenblum MD, FRCPC
Associate Dean, Physician Scientist Training, University of Toronto

Professor of Paediatrics, Physiology, and Laboratory Medicine and Pathobiology at the University of Toronto, a Paediatric Nephrologist and Senior Scientist in the Research Institute, the Hospital for Sick Children and Tier I Canada Research Chair in Developmental Nephrology. Dr. Rosenblum is a MD graduate of Dalhousie University. He completed a Pediatric residency and a fellowship at the Children's Hospital, Boston and a postdoctoral fellowship at the Harvard Medical School. His research focusses on molecular mechanisms that control normal and malformed kidney development in genetic mouse models, in particular signaling by bone morphogenetic WNT and Hedgehog proteins. His lab has generated several models of human kidney-urinary tract malformation. Dr. Rosenblum is deeply engaged in developing and managing career development programs for clinician scientists. He founded and led the Canadian Child Health Clinician Scientist Program and in his present role as Associate Dean, Physician Scientist Training in the Faculty of Medicine, University of Toronto, he is Director of both the MD/PhD and Clinician Investigator Programs.

"Promoting Agency Among Young Investigators Towards Health Research Policy Development"

Thank you for the invitation to participate in this panel.

My contention for this brief presentation is that early stage researchers should be partners in developing research policy – the entire Canadian health research enterprise will be better as a result of such a partnership. But this engagement cannot be experienced as 'token' - it cannot be experienced as only representation but needs to be experienced at the level of action.

So why should early career researchers be partners?

My reasons are multiple. First, a thriving cadre of young investigators is critical to Canadian health research. Early career researchers are a demonstrated energetic source of creative and novel contribution. Second, young investigators are the future of health research in this country and are invested in the system for the long term. They are the ones who will have to thrive in our future state and need to shape it. And third, there is abundant evidence that young investigators are very well positioned to inform that future. This is not only at the level of advocacy but, importantly, at the level of governance. Young investigators need to be engaged at the level of decision-making.

Let me provide examples, drawn from my own experience, of how such engagement has made a real difference.

MD/PhD and postgraduate clinical investigator trainees have been equal partners in analyzing physician scientist training programs and designing modifications to enhance education and career development at the University of Toronto. Trainees consistently demonstrate an ability to work in partnership with faculty to analyze programs, identify opportunities for change, and design solutions that would not have been devised without their engagement. Implementation strategies aimed at enhancing their career development requires their engagement from the beginning of the process.

At a national level, the Clinical Investigator Trainee Association of Canada, an organization that represents undergraduate and postgraduate physician scientist trainees, has created a unique body of literature on their career development and has advocated effectively to health research organizations. Despite their advocacy and contribution, I do not believe that they have been adequately engaged at the level of governance and decision-making.

In the Canadian Child Health Clinician Scientist Program, a training program dedicated to the training of clinician scientists across the breadth of child health professions, trainees and young investigators have, from the time this program was founded, been part of executive governance and have shaped the evolving nature of this very successful endeavor.

As a final example, I highlight the persistent focus of the Kidney Foundation of Canada on the young investigator. Despite the slings and arrows of our economy, availability of funds, and shifting research priorities, the Kidney Foundation has continuously prioritized programs focused on training new generations of kidney researchers and bridging them, via targeted programs, from training to independent investigator. Beyond the importance of these funding programs themselves, the Kidney Foundation engages early career scientists in generating research strategies in concert with other groups in the stakeholder community. Young investigators feel valued in the kidney research community.

For me, these examples highlight the power in recognizing a stakeholder and engaging that stakeholder as a partner including decisions that reflect their concerns. That is why I used the word ‘agency’ in the title of my remarks – ‘promoting agency among young investigators’.

What do I mean by ‘agency’? Generally, ‘Agency’ acknowledges the capacity for intentional, self-directed behavior. In its essence, it is empowering. Social science research teaches us that giving agency leads to better confidence, engagement and performance at the level of individuals and communities.

If we agree that a thriving cadre of young investigators is critical to the Canadian health research enterprise;

if we agree that early career investigators provide a unique insight into the challenges attendant with their careers and the future shape of science;

if we accept that giving agency not only fosters success among those with agency but also the society in which they function;

if we accept these notions, then I believe we should (i) facilitate advocacy, (ii) engage young investigators as partners in health research policy, and (iii) evaluate our policies and strategies for whether they represent the context and concerns of young investigators and promote their success.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Holly Whitteman

Dr. Holly Witteman PhD
Co-Chair, Association of Canadian Early Career Health Researchers (ACECHR)

Assistant Professor in the Faculty of Medicine, Université Laval, director of a research unit and scientist at the Research Centre of the CHU de Québec-Université Laval. With an interdisciplinary background in mathematics, human factors engineering, human-computer interaction and decision sciences, her research is about the design and evaluation of digital media for health education, communication and decision making. She specializes in interface design for health risk communication and decision making, including design methods to support optimal user- and patient-centeredness of decision support tools. As one of three national co-chairs of the Association of Canadian Early Career Health Researchers, she is actively involved in identifying strategies for a long-term vision of sustainable, equitable health research funding in Canada.

"Setting a place and making space at the table"

Thank you very much and thank you for the invitation to speak today. I would like to start by acknowledging that we are on unceded territory in the traditional land of the Algonquin people.

I'd like to also acknowledge that I am speaking from my perspective in health research. Although all my degrees are in Engineering and my postdoc was in Social Sciences, I apply my knowledge from these fields in Health Informatics.

I'd like to invite us to step back a little and look at this a little more broadly. What do we know about involving people who will be affected by policy in the policy development? I think we can look to some broader social movements to inform our understanding. One example specific to health policy has to do with patient partnership in health research. A common expression that underlies such partnership, especially in the UK, is a slogan originally developed by people with HIV/AIDS: "Nothing about us without us". I believe this way of thinking – "Nothing about us without us" – is critical in ensuring that policy is developed such that it respects what matters to all the people who may be affected by such policy. Another similar example in health policy – one that is very personal to me – is the way that adults with type 1 diabetes and parents of children with type 1 diabetes influenced federal medical device policy. They built do-it-yourself technology on top of commercial products to more easily transmit data from continuous glucose monitors. This ease of transmission was technically possible but the policy in place at the time did not allow the manufacturer to offer it. So the people whose lives

were negatively affected by this policy developed ways around it and shared their solutions widely and freely with others, leading to an ultimate policy change. The hashtag (or slogan, if you will) for this activity is #WeAreNotWaiting. I believe that's an inspiring and useful slogan in many policy domains.

We've heard a lot of things today about the importance of early career investigators being involved in policy. As reflected in the title of my talk, there are two main lessons that I think we can learn and apply from broader social movements.

The first lesson has to do with "setting a place at the table". Speaking to what Dr. Norman Rosenblum said earlier, when you have one person, that person runs the risk of being a token. You usually need at least two for representation. There's empirical evidence to support this; for example, from studies of patients sitting on guideline development committees. The lesson we should draw is that we need to set at least two places at the table.

The second lesson is about "making space at the table". This is harder. It's relatively easy to invite people; it's harder to listen to them. You've got this nice group of people, you're all friendly colleagues, you've worked together for a while, and you have a way of doing things. It can be hard to accept new people who come in and challenge that comfortable way of working together, who bring different ways of questioning things, who aren't happy with the way you've always done things, and who may not be willing to be there and spend their time out of their lab, sitting on your policy committee, without being able to actually bring about any substantive change. Making space at the table means sharing power. Sharing power is hard when it has not been shared in the past, but this is the critical step for having the people who are most affected by policy involved in setting policy.

With that, I'd like to pass the discussion to Jim and thank you very much again for this opportunity to present today.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Michael Hendricks

Dr. Michael Hendricks, PhD, Co-Chair, Association of Canadian Early Career Health Researchers (ACECHR)

Assistant Professor in the department of Biology at McGill University. He conducts fundamental research on how the environment and stress affect the development and function of nervous system. Dr. Hendricks career has given him experience with funding systems in Singapore, the United States, and Canada. In response to recent changes at CIHR, he and others founded the Association of Canadian Early Health Researchers, a group that advocates for sustainable and equitable investment in future of Canadian science and best practices for lowering entry barriers for young scientists.

"Calgary Trainees and New Faculty in Research Policy Development"

When I was an undergraduate in the 1990s, I was an English Literature Major and a Music Minor and then I took a course in Developmental Biology, which is one of those experiences that you have that changes the direction of your life. Development captured my imagination in a way that no other field had. This was a time when Developmental Genetics was really coming into fruition and Dr. Rossant was at the centre of a lot of this work. And what it demonstrated to me and what really blew my mind about it was that it demonstrated the deep, shared homology and conservation of biology among organisms. It reaffirmed my belief and confidence in model organism research and basic research. And I have become something of a neuroscientist in my career, but by heart, I am a developmental biologist and that goes back to that era of developmental biology. I think that era also demonstrates something that I am just learning more about recently, which is, inthat time, I have seen the full cycle of basic curiosity, discovery research and I get from that the blue sky level of research to clinical application. And I think that's also a great lesson that investing in that kind of research has always been and always will be sort of the foundation of scientific progress of innovation, of improved health care.

So I just want to say, ‘Thanks, Janet’. It’s great to be part of an event honouring your work.

So I started my Faculty position in 2013. For a scientist, that’s probably the most exciting and optimistic point in your career. You’ve just been chosen by your department and university over sometimes, hundreds of other candidates. You have all these ideas in your head about what you want your research program to be like. You’re thinking about Science and your new responsibilities and learning how to be a university professor.

The last thing you want to do is get involved in policy and advocacy, right? These are not things we are trained to do. They are things most of us are not drawn to. So our group, the Association of Canadian Early Career Researchers, the name of which demonstrates how little experience we have had in health advocacy, the acronym is even worse, was formed in a very reactive, very reluctant mode. This was a situation where we basically perceived a threat to the ability to launch our careers. So the circumstances motivated us. And we had to overcome a big barrier of the general nature in which we wanted to interact with science and the scientific community in Canada.

For me, it started out and I want to say that in forming this organization, this organization was formed with the help of a lot of people, who are our senior colleagues. We were casting about, I was particularly casting about, not knowing what to do. And I began emailing people who were involved in the Science Policy world to get their advice and perspective. And to do a sort of “sanity check” with what we were seeing and experiencing.

One of these people was Bill Tholl, Head of HealthCareCan. And I emailed him and 10 minutes later I got a long email reply from him inviting us to participate in a policy conference in Ottawa. And really helping us articulate our message, in the context of policy discussions that were going on. He set up with us a sort of Summit with senior leadership people at CIHR. It happened very quickly, as well. So he really dealt us in and gave us a voice. Other people have done that, as well. There are people at CIHR who have communicated with us and have been supportive of us.

We want to move on now from this reactive mode. I think we have had some positive impact on policy discussions, as it relates to early career investigators. And we want to transition from this reactive mode to a more sustained mode, where we are supporting the interests of early career investigators and maintaining engagement with these policy organizations.

Because I do think that beyond this acute situation we have experienced recently, early career investigators always have an interesting perspective to add. We may not have the

depth or length of experience in policy, but we come from a variety of countries, but most often from Canada. So as a group, we represent a breadth of experience, different funding systems and different policy environments and so we can bring this information to the table.

Also, we're the ones who have to live the longest with policy decisions that are really going to shape our careers and determine what our careers are going to be like.

I call this talk, "The Risks and Rewards of Advocacy" mostly because Aubie asked us for a title one week before the CIHR grant deadline and I just made something up.

I will say the risks for me have been getting out of my comfort zone. Being optimistic and being a scientist and sometimes taking a more adversarial or strident position or tone than I'm normally used to, but when consultations fail, sometimes louder forms of advocacy can be the answer.

The rewards have been many. I think it is a larger professional network than what would have been originally possible to develop in so short a time. I've met people, early career people across the research spectrum, people like Holly Witteman, whom I probably never would have met otherwise from different research domains, but now I consider a colleague and a friend. And there are people across Canada who are unified in a way that I think we weren't before.

The risks, primarily, have been for other people, people who have dealt us in, by inviting inexperienced and perhaps angry early career scientists to their meetings and letting us talk to people. And really giving us a voice at the table that we didn't have before.

So with that, I would like to let the other speakers speak and get on to the discussion part of the event. Thank you.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Jim Woodgett

Dr. Jim Woodgett, PhD, FRSC
Director of Research, Senior Investigator Lunenfeld- Tanenbaum Research Insitute, Mount Sinai Hospital, Toronto

Jim Woodgett is Director of Research at the Lunenfeld-Tanenbaum Research Institute (2005-) and runs a lab studying the molecular signals used by cells to determine cell fate and how these are subverted in diseases such as Alzheimers and cancer. He is also a passionate advocate for young scientists, diversity in science and a huge supporter of the Naylor Panel report on Fundamental Science.

"Diversifying the Established Order in Research Policy Development"

Thank you to the organizers, especially Aubie, with whom I actually shared a breakfast and a lunch before this meeting, demonstrating our edible commitment to this event!

The 3 important words in my title are: "Diversifying" and "Established Order". A lot of the problems we have encountered over the past few years, especially for early career investigators, and I am certainly guilty of this, have been put it at the door of the CIHR reforms. But academia has also struggled to keep up with societal change, especially in equality of opportunity. If we compare our faculty with our graduate student and undergraduate student populations, there's an inversion in proportions of men to women in all areas, not just in health research. As we move up the career ladder, women tend to drop off. There are well understood reasons for this such as search committee bias (and composition), insufficient recognition of maternity or health leaves and familial care pressures.

The situation has certainly been exacerbated by a number of mistakes in CIHR program design, particularly among early career investigators. Indeed, a silver lining that emerged from this was organization of early career investigators to create an effective voice, driven in large part by Holly Witteman and Michael Hendricks and their colleagues - this has been inspirational. They have also been careful in describing what they are trying to do in their advocacy. While it's not in the crazy association acronym (Association of Canadian Early Career Health Researchers, ACECHR) they have always spoken about career stages: they talk about the problems for mid-career investigators, as well. They are wise to do so because in a few years' time, they will magically enter mid-career!

What we must do is recognize the strength of diversity. It is very clear that exclusion of early career investigators from conversation of science policy and development of new ideas has been very much to our detriment. As mentioned, we've known that this cohort represents the most innovative and out-of-the-box thinkers. They emerge from an incredibly competitive cohort of people who have been waiting in line for a chance for a faculty position. We also should remember that science is largely

driven by young people, the people who do the actual lab work, the graduate students and postdoctoral fellows and then the early career investigators.

That said, we've got to be very careful to not confuse administration with policy. We need to protect our young investigators from administrative responsibilities. Their job is to get their careers launched and we should shield them. As more established researchers, we need to allow them to focus on their science, to enable them. This doesn't mean excluding their input into institutional discussions, roles on search committees, etc. – rather to keep their non-research burden low.

We must also be careful about entrenching programs that have inherent flaws in diversity. The most egregious is the Canada Excellence Research Chair program with 25 of 26 chairs being male. Instead of letting it die, another round was recently announced by the Minister of Science, who is a strong advocate for women in science! Mixed messaging? Let's invest in attracting and growing our talent, rather than transferring – it's leads to far better ROI.

I note the presence of Minister Reza Moridi, who has done phenomenal work in supporting science in Ontario. A highlight is the Early Researcher Awards program. It's an effective program with great ROI because it targets young researchers when they need help the most. The Minister also mentioned the Ontario Research Fund and my institution, the Lunenfeld-Tanenbaum Research Institute, has been very successful in winning these awards; they really are transformative. However, to compete, we put our most established people forward. Moreover, one of the features of the Ontario Research Fund is the requirement for a private sector partner. Young investigators have not built those relationships yet. Perhaps the rules could be changed to require younger investigators be incorporated in these teams, hence acting as an accelerator for their science.

Lastly, we must also remember that we traditionally don't have a lot of respect for professional career development of people who don't remain in academia. In fact, nowadays, staying in academia is the alternative career. We noticed this by tracing the fates of our LTRI alumni - in large part they're doing incredibly well outside of academia. We need to ensure that the message that there is much more to success in science than academia, that we are training them to be open-minded, to define and answer problems. It doesn't matter which area of society they ultimately make their living from. I hope more go into politics, like Ministers Moridi and Duncan, because that's where that type of open-minded thinking is going to have significant impact.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Janet Rossant

Dr. Janet Rossant, C.C., FRS, FRSC
2016 Friesen Prizewinner, President, Canada Gairdner Foundation

Senior scientist in the Developmental and Stem Cell Biology Program at the Hospital for Sick Children and University Professor in the Department of Molecular Genetics at the University of Toronto. She received her undergraduate degree from the University of Oxford and her PhD from the University of Cambridge. Her research interests are focussed on understanding the development of the early mammalian embryo and its derived stem cells. She is immediate past Chief of Research at the Hospital for Sick Children, a research enterprise with over 800 research trainees at various levels.

Comments

Thank you. When Aubie and I discussed a potential Roundtable that we might pull together under the Friesen Prize, we came up with a proposal on the role of early career investigators and their role particularly in influencing policy development because like everybody who has spoken today, I feel strongly that young investigators are the future of Science and the future of application of Science and what it offers to the broader community in Canada and the world today.

I think we've heard that in spades this afternoon and I agree with a lot of what was said. There are a couple of things that I would comment on. We heard that when involving young investigators in policy, there are really two ways to think about it. One, with the amazing group led by Michael Hendricks and Holly Witteman. We're looking at investigators who are in academia. So we're all sitting here, largely with the academic hat on. And we're asking people in academia to be engaged in looking at the changes of policy and regulation within the academic environment, but using their skills from the academic environment and the kind of research that they are doing to actually influence policy much beyond that.

For example, yesterday, we were visiting with Health Canada and they are eager for insights and not just in the problems that are being looked at today, eg. opioids, vaping, whatever, but they want to know, what's coming down the pipe so to speak. What's the future? What's Science going to be doing? They're all scared because they don't necessarily know. They also know that policy moves extremely slowly. So they want to be ahead of the game. So there are opportunities for everyone to be engaged. And my push to them was that the people you need to talk to are not the people like me or Jim Woodgett or any of us. We've been around. We may be able to say wise things. But we can't tell you what real cutting edge Science is going to be translated into policy and impact particularly on the health care system tomorrow. You've got to be talking to the young investigators who are doing the research.

So we can help point the way. And I think we need to really engage those people at every level.

I'm going to disagree with Jim Woodgett. I would like to disagree just a little bit, Jim. Only on one thing – it's a nuance, not a major disagreement. And that is, we should keep young investigators within our institutions and within the universities, out of administration. And I absolutely agree. You don't want young people sitting on the endless committees that people like Jim and I have had to sit on for years and indeed, both of us, we know. For young investigators, this is not the right thing to do. But it is also, of course, true that the administration of the university or the hospital or the institution that you are working at, is going to make policy that is going to affect you and your future. And again, you need to be at the table and invited at the table for those kind of discussions and to make sure that your voice is heard. And I will say certainly that when I was at the Lunenfeld, that was a problem, not under Jim's leadership, but it was a problem. In fact, the young investigators at that institution sort of got themselves together and said, 'you know, you're gonna have to listen to us'. So I think there are opportunities to engage with administration, that you don't have to do the boring bits. Leave that for the older guys. And I would like to comment on the older guys. Getting rid of old scientists. It is an issue. I think it's an issue. Old scientists, like me, well actually I am not holding down a salary, uh, there are scientists who continue and may be continuing beyond their due date and are holding down faculty lines that should be going to the young scientists.

I think that CIHR reforms tended to favour the older, established scientist, which made it particularly difficult for young people coming in. And meant that older established scientists had a seven-year runway, in which they could continue. So I think it is up to the older scientists to, at some point, say, 'you know what? This is a young person's game". And we are at an incredibly exciting time in research today. The approaches, the technology that we can do are hugely powerful. And there are opportunities for people to take up other careers than staying in academia. And in fact, the majority of our PhDs do. And those careers can absolutely and should involve working in policy, whether it's policy in government, whether it's policy within foundations, whether it's policies within international organizations. The training that we give our PhDs is in critical thinking and in the way of exploring the world is really going to put them at the forefront of many areas.

Of course, we all know that physicists today are mostly taking up jobs as quarks on Wall Street or Bay Street and I'm not sure this is a good thing. Some of them were taking us down the road a few times, but you know, there are real opportunities to use skill sets that are transferable across different domains. And again, as some people have said, we need to set up training programs that allow that. And certainly at Sick Kids, we do that. We have a highly integrated training program, as I mentioned yesterday, that actually provides a stage of career options for graduate students up to retirement. So we have modules, training modules of how to retire and step aside for the young people.

I look forward to today's deliberations to reinforce principles of inclusion and see if there are novel perspectives worth exploring.

Roundtable

"The Role of Early Career Scientists in Research Policy Development"

Panel Presenter

Dr. Mehrdad Hariri

Dr. Mehrdad Hariri, D.V.M., M. Sc.
CEO and President, Canadian Science Policy Centre

Founder and CEO of the Canadian Science Policy Centre (www.sciencepolicy.ca), a not-profit virtual HUB for science technology and innovation policy in the Canada. Dr. Mehrdad Hariri founded the national annual Canadian Science Policy Conference (CSPC), a national multidisciplinary forum dedicated to the Canadian Science Technology and Innovation (STI) Policy discussions, engaging hundreds of organizations from various sectors and across the country to discuss the most pressing issues in Canadian Science and Innovation Policy. Mehrdad has numerous publications and opinion pieces in various media outlets, and regularly appears in media as a commentator on science policy issues. He studied in the fields of Veterinary Medicine, Cell Biology and Functional Genomes, in Tehran, Montréal and Toronto universities, and performed a post-doctoral research fellowship at the McLaughlin-Rotman Centre for Global Health

Advantages and Disadvantages of Graduate Studies in a Hospital Research Institute Environment

So I took a few notes to share with you. First of all, I am pleased to have this Roundtable here. Congratulations, Aubie, and Friends of CIHR. It's an honour to host a Roundtable of the Friesen Award here at CSPC, Dr. Friesen, Dr. Janet Rossant. It is great to have you here.

Just a few points about the capacity-building. That's what we should do in terms of providing opportunities for early career scientists to relate themselves to policy and be engaged in that process and contribute back to society.

First of all, I think that we have to change our notion that policy is a side-career for scientists. That's a 20th century notion. That has changed. Policy is a career in Science. And scientists can serve as policymakers, as their job. We have to change the training system in order to provide them with this capacity to serve in such positions.

On capacity-building, the training part is very important. The AAAS Fellowships were mentioned here and I was one of the ones who was advocating for the similar Fellowships here in Canada for years and talking to Mitacs and finally they accepted the idea and established these AAAS Fellowships. And the other one that I talked to Minister Moridi about, and I want to ask for his commitment today, is the establishment of Ontario Science Policy Fellowships, but at Queens Park, Ontario will be the leading province in Ontario to have established a fellowship for provincial legislature.

Also other capacity-building ideas that we have established in 2013 with this encouragement of Science Policy Awards of Excellence. This year will be the second one and I hope that we can continue on that on an annual basis.

And also the notion of the training system of the PhD has to change in order to provide scientists with other capacities and other capabilities to serve in society. For example, we have the MD-PhD. We must have PhD-Policy, PhD- MBA etc,. as a minor so that they can have scientific training and be able to serve in those capacities.

I think these are extremely important. Without leadership, without dedicated resources, that would not happen. I'm really happy to see that individuals from different parts of the country got the notion that the importance, and let me emphasize, the importance of early career scientists to enter the policy arena.

This conversation didn't happen, never happened 8 years ago when I started the Science Policy Conference. I went to a university prof's office in order to get advice from him and that was back in 2008 or 2007, if I'm not mistaken. The older prof asked me, 'so how much do you know about the science policy?'. I said, 'I don't know much. I'm learning. But I know there is a need for this Forum'. I was politely kicked out of that office. But never mind. The Forum happened. A lot of profs helped me. Reinhart Reithmeier is here, he was one of the very first who helped this happen.

My point is that we have to be receptive to the new ideas. There is a consensus right now, around the country on capacity building for early career. We have to seize the opportunity, mobilize the resources and build on that, build capacity for younger scientists.

Thank you for the opportunity. I look forward to the discussion as well.

P. Davidson: Thank you, Mehrdad, and thank you all for being with us this afternoon and for engaging so fully on the question.

As we close, I just want to make two quick comments. First of all, I was glad to hear the diversity theme picked up. At Universities Canada, we are promoting very strongly the idea of "inclusive excellence". And that you cannot have excellence without diversity. And we have to do better as a country. In Canada, universities are working in that regard.

The second is that we need to ramp up investment in the research enterprise, if Canada is going to reach its full potential for Canada and for the world.

Thank you all for being with us this afternoon. And we conclude this session now. Thanks.

Celebrating Science and Administrative Leadership

The Henry G. Friesen International Prize in Health Research is awarded in recognition of the distinguished leadership, vision and innovative contributions of Dr. Henry G. Friesen. The prize supports an annual Public Forum and luncheon address to the Canadian Academy of Health Sciences (CAHS). Through the partnership of CBC Radio One Ideas, the lecture is broadcast to reach the broadest possible audience.

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