

## Supporting Women's Research Careers: Strategies for Success

**F**or decades women have been under-represented in some science fields in Canada. While the percentage of female undergraduate students engaged in science studies has increased, reaching over 50% in some university faculties, women are less likely to be found in the upper ranks of graduate studies and the research community. Furthermore, female students are often concentrated in particular disciplines, creating an even more notable gender imbalance in certain fields such as physics, computing sciences, mathematics and engineering. Indeed undergraduate programs in computer science and computer engineering are reporting a decline in female enrolment in the past few years. Lastly, women who have persevered to enter academic positions in science, health, engineering and technology are often less successful in obtaining major grants to sustain their research programs.

Over the past five years, the Institute of Gender and Health (IGH) of the Canadian Institutes of Health Research (CIHR) has assumed a leadership role in addressing these questions with the intent of promoting greater gender balance in scientific fields. CIHR and IGH are taking steps to ensure that women are well represented among the next generation of health researchers.

### The Current Situation

In 2001/02, women comprised 30.4% of students in mathematics and physical sciences and just 23.1% of the engineering and applied sciences faculties throughout the country. Overall, 9% of engineering faculty, 12.9% of academic staff in mathematics and physical science and less than 25% of the professoriate in agricultural and biological sciences are women.

The number of female applicants to CIHR's awards competitions is discipline/theme-specific. A higher number of women (PhD awardees, postdoctoral recipients and new investigators) applied to the "population health" and "health services" themes than applied to the "biomedical" and "clinical" research themes. Only 15% of Tier 1 and 22% of Tier 2 of Canada's Research Chairs are women.

IGH has responded to these issues by working with CIHR and other stakeholders to: (1) mobilize national science/research funding agencies and policy leaders to develop strategies to recruit and retain women in research; (2) establish international linkages to promote partnerships on women in science; (3) provide funds for women in research careers; and (4) support networking and mentorship.

### Mobilizing National Partnerships and National Action Plan

Dr. Mark Bisby, CIHR's Vice-President Research portfolio and I, as Scientific Director of the CIHR Institute of Gender and Health, created the National Steering Committee on Fostering Women's Research Careers. The National Steering Committee is comprised of 11 research funding agencies/associations: the National Science and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC), the National Cancer Institute of Canada (NCI), the Canadian Foundation for Innovation (CFI), Canada Research Chairs (CRC) program, Health Canada, Genome Canada, Heart and Stroke Foundation of Canada, the National Association of Provincial Health Research Organizations and the Association of Universities and Colleges in Canada (AUCC).

These funding agencies shared statistics on recruitment and retention of women. Two major trends emerged across funding agencies: (1) women are more predominant in junior rather than in senior levels of research careers and are dropping out through the leaky pipeline; (2) women are more predominant in some disciplines/fields than others.

The Committee developed potential solutions to address these discipline-related and career stage barriers. These strategies include:

- Scrutinize the criteria used to evaluate excellence in research careers. Current measures of excellence may not reflect the additional workload tasks or childcare issues faced by many women.
- Collect qualitative and quantitative data to determine: (1) if women are leaving research careers in academic settings to pursue work in government or private industry; (2) if they have left scientific endeavours altogether; and (3) why they are leaving.
- Establish a Science Mentoring Program for Women to attract and retain women in science, engineering and technology.
- Expand support for women in mid and senior stages of research.

IGH and CIHR have hosted four successful roundtables that brought together funding bodies, government officials and representatives from academic and non-governmental organizations that are interested in promoting women in research careers. In addition to the National Steering Committee, the stakeholder groups include: Status of Women Canada, the Canadian Coalition of Women in Engineering, Science and

Technology and the Federal Committee on Women, Science and Technology.

Participants at these roundtables supported further analysis of the current state of gender inequality, recognized the potential for gender discrimination in programs and policies and planned a further examination of best practices. Notable roundtable presenters included Dr. Nicole Dewandre from the Women and Science European Commission of the European Union; British scientist Dr. Nancy Lane, author of "The Rising Tide"; Dr. Nancy Hopkins of Harvard University and Massachusetts Institute of Technology; Dr. Arthur Carty, the National Science Advisor to the Prime Minister; and the Honourable Minister of State for Public Health, Dr. Carolyn Bennett. The European Commission Helsinki Group on Women and Science produced a significant report called "National Policies on Women and Science in Europe."

### A recent review of CIHR's principal investigators shows a narrowing of the gap between sexes.

#### Establishing International Linkages

IGH is actively promoting international linkages on issues relating to women and science. This will promote best practices, expand cross-national research, improve capacity-building collaborations, and promote female role models among youth.

Dr. Yvonne Lefebvre, representing the IGH Institute Advisory Board, along with delegates from Canada, France and the United Kingdom, participated in Women Crossing Borders II, an event sponsored by the Royal Society. The event examined the lack of women in science and the role that national academies of science could play in addressing the situation.

IGH and CIHR have since partnered with the Royal Society, the British Council, the Royal Society of Canada, Health Canada, the National Science and Engineering Research Council, and the Department of International Trade, in an attempt to raise the international profile of women in science, engineering and technology. In 2004, Dr. Ruth Graham became the first British participant in the Canada-UK Women in Science, Engineering and Technology (WISSET) Exchange Program. Drs. Elizabeth Cannon and Yvonne Lefebvre, both Canadian scientists, have since participated in the exchange program. WISSET participants, selected for research excellence and communication skills, lecture to a variety of audiences, serve as role models, encourage mentorship and increase public awareness and discussion of women in science.

IGH, CIHR, NSERC and the Ministry of Education, Culture, Sports, Science and Technology of Japan also established the Canada-Japan Women in Science, Engineering and Technology Exchange Lectureship. Four awards will be granted annually to women in science. These women will provide lectures to schoolchildren and will network with colleagues to promote collaborative research between Canada and Japan.

Furthermore, IGH has been engaged in "Women, Health and Science," a program launched by the Science and Technology section of the Canadian embassy in Paris. The program, which is hosted at the World Life Sciences Forum, brings together global experts and key governmental officials for high level discussions on a select theme. IGH will partner with France on workshops in Canada and elsewhere in 2005/06 and beyond.

CIHR and IGH supported a pilot project for the International Women in Science Web Portal (2003) linked to the International Network for Women in Engineering and Science.

#### Funding Women in Research Careers

The efforts of IGH and CIHR to foster women's research careers have led to an increase in the number of female researchers who have been funded over the past four years.

A recent review of CIHR's principal investigators shows a narrowing of the gap between sexes. In 2000/01, 27% of the PIs of gender-relevant research in CIHR open competitions were female, whereas in 2004/05, 40% of the PIs were female. The proportion of funding based on the sex of the PI also narrowed over the five-year period. In 2000/01, women PIs received 27% of the allocated funding to gender-focused relevant research in CIHR open competitions, and by 2004/05, women PIs have not only increased in number but now receive 42% of the allocated funding.

To help attract and retain researchers in women's health in Ontario, the IGH has played a leadership role in establishing the Ontario Women's Health Council (OWHC)/Institute of Gender and Health Joint Program in Women's Health. The partnership between the OWHC and IGH is a precedent-setting example of how organizations committed to building research capacity can cooperate to help make gender, sex, and health research a national priority.

Through this program, women's health scholars have received fellowships and mid-career awards to sustain and encourage women's health research. Awards have been made available to Master's and doctoral students for a period of three years. In addition, funds have recently been invested in new investigator awards.

#### Networking and Mentorship

In addition to exchange programs that are designed to expand networking opportunities and provide mentorship throughout

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the stages of women's research careers, IGH has been proactive in creating networking and mentorship opportunities. The lack of female role models and mentors has been identified as a major barrier to attracting young women to science, technology and engineering fields.

IGH and CIHR provided financial support for *Success Strategies for Women in Science: A Portable Mentor* edited by Peggy Pritchard. This volume in press offers significant strategies for women navigating different stages of their research careers, including time management, strategic decision-making and balancing work and life.

IGH also supported the IGH Research Network Online Registry, a web-based networking tool at [www.igh.ualberta.ca](http://www.igh.ualberta.ca). Network participants can register their interests and locate others with similar or complementary skills for potential collaborations. At present, over 1,000 researchers and students engaged in gender and health research have enlisted in the registry.

I have also been engaged in presentations to a variety of audiences in order to raise the profile of women in research careers and to promote the work of IGH and CIHR in this arena. To illustrate, I addressed the National Institutes of Health International Colloquium on Career Paths for Women in the Health Sciences in Bethesda, Maryland, as well as the Canadian Science Writer's Association meeting to highlight the important role of women in science.

### Concluding Thoughts

As the August 2005 article in *Science* entitled "More Women in Science" indicates, national strategies are needed to keep women moving through the pipeline to senior ranks and to foster gender balance across science fields. CIHR has spearheaded timely and transformative measures to recruit and retain women researchers.

### About the Author

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