By Sonya Corkum

CIHR: A Catalyst for Commercialization

Transformative innovations in health research, driven by solid investments, will enable Canada to develop an evidence-based healthcare system. To be successful and innovative, Canada must align people, programs and governmental structures in order to break down the silos that impede innovation. That way, Canada will be positioned to take advantage of the exponential growth of knowledge occurring in the health research area.

Collaborative programs, developed by the Canadian Institutes of Health Research (CIHR), will help to bring new products and treatments to the marketplace that improve quality of life, enhance the Canadian healthcare system and contribute to a robust economy.

Together with its many partners, CIHR is making contributions to the development of biotechnology in Canada in several ways:

- funding the research that is at the start of the pipeline of innovation
- supporting the training of the next generation of researchers
- taking research to the market
- ensuring competitiveness on the world stage.

Funding Innovative Research at the Start of the Pipeline

A recent analysis of U.S. patents revealed that more than 70% of biotechnology citations were for research papers originating at public-science institutions (*OECD, Science, Technology* and *Innovation in the Economy*). Clearly, scientific progress directly propels the commercialization process. Government-sponsored research is critical to advancing that scientific knowledge. CIHR is fully aware of the fundamental importance of this link and the role of discovery research as a critical first step.

The contaminated water crisis in Walkerton, Ontario, shocked Canadians and public health professionals worldwide and highlighted the dangers of E. coli 157-H7. This bacterium is also the leading cause of "hamburger disease," which affects 50,000 North Americans each year and kills 500 people annually. Beyond the human toll, the cost to meat producers has also been staggering – as much as $5 billion annually.

All of this may change if Dr. Brett Finlay's research proves to be successful. With the help of CIHR funding, Dr. Finlay, of the University of British Columbia (UBC), has developed a vaccine to protect cows against this strain of E. coli 157-H7. It has been effective in pilot evaluation studies, and is now being tested in more than 70,000 animals. If successful, Dr. Finlay's vaccine is expected to dramatically reduce the economic and health costs associated with E. coli.

Dr. Molly Shoichet, a CIHR-funded researcher from the University of Toronto, has helped rats with injured spinal cords regain movement. Dr. Shoichet developed a flexible tube for the rats that imitates the structural flexibility of a spinal cord. Its architecture allows nutrients to pass through so that nerves can grow inside. Dr. Shoichet's work falls under CIHR's cross-cutting initiative in regenerative medicine and aims to develop innovative, cost-effective and ethically validated approaches to diagnosis and treatment of diseases that vary from juvenile diabetes to heart failure to spinal cord injuries.

Training the Next Generation of Researchers

World-class research requires world-class researchers. Young Canadian and international talent require support through post-doctoral fellowships, grants, awards or training programs. Canadian trainees should receive support for training undertaken elsewhere, bringing new skills, relationships and insights to enrich research in Canada upon their return.

CIHR is committed to capacity-building by ensuring that talented researchers in Canada have the resources, tools and training they need to do their work well.

The CIHR Strategic Training Initiative in Health Research brings together groups of accomplished health mentors and educators to work collaboratively to train and support research talent, much of which is in the field of biotechnology. For example, the CIHR Training Grant in Bioinformatics, led by Dr. Steven Jones at the BC Cancer Agency, will train the next generation of experts in bioinformatics. His team will focus on everything from validating genes involved in disease to targeting areas for therapeutic development.

CIHR also offers innovative, cross-cutting funding programs, such as the Clinician Scientist Award, which is offered to highly qualified and motivated clinicians who have been identified by a Canadian medical or dental school as having strong potential to become clinician scientists. The MD/PhD Program Studentships are offered to students who are registered in a combined MD/PhD program at institutions in either British Columbia, Alberta, Nova Scotia, Manitoba, Newfoundland, Quebec or Ontario.

Taking Research to Market

Innovative research must provide an opportunity for health researchers to work in close cooperation with Rx&D companies. Health research undertaken should be beneficial to both parties with a view to improving the quality of health of Canadians.

The CIHR/Rx&D Research Program brings together pharmaceutical companies and government. With the recent international outbreak of Severe Acute Respiratory Syndrome (SARS), CIHR responded with a three-pronged approach to battling the disease, which included the creation of the Canadian SARS Research Consortium (CSRC). The CSRC will develop and coordinate the implementation of a national research agenda on SARS in five broad research areas: diagnostics; vaccine development; therapeutics; epidemiology and databases; public health and community impact. Voluntary participants of this consortium include CIHR, Health Canada, Michael Smith Foundation for Health Research, Ontario Research and Development Challenge Fund, Fonds de la recherche en santé du Québec, Protein Engineering Network of Centres of Excellence, Canadian Network for Vaccines and Immunotherapeutics of Cancer and Chronic Viral Diseases, GlaxoSmithKline, Aventis Pasteur and the Canadian Lung Association.

The CIHR/Small and Medium Sized Enterprises (SME) Research Program is jointly funded by CIHR and Canadian biotechnology companies. The program strengthens Canada's technology transfer by supporting research commercialization in start-up companies, university spin-offs and SMEs.

Thanks to this program, Dr. Michel Tremblay, Director of the McGill Cancer Centre, and his colleague Dr. Morag Park are partnering with Kinetek Pharmaceuticals Inc. in Vancouver to validate novel targets for the development of new cancer-gene inhibitors. This project has potential benefits for thousands of cancer patients in Canada alone.

CIHR's Proof of Principle (POP) Initiative facilitates and improves the efficiency of commercial transfer of knowledge and technology resulting from research. Industry-partnered POP grants provide opportunities for biotechnology companies to partner with researchers in the early development of technologies.

The Intellectual Property Management (IPM) Program strengthens the ability of universities and hospitals to recognize, protect and manage intellectual research property; attract potential users; and promote the professional development of personnel involved in IPM. The program is managed jointly by CIHR, NSERC and SSHRC.

Competing on the World Stage

Unravelling the structure of hundreds of human proteins is the ambitious goal of a partnership that brings together health researchers from Canada, the United Kingdom and the global pharmaceutical industry. Thanks in part to CIHR funding, Canadian scientist Dr. Aled Edwards, a world-leading expert in proteomics and structural genomics, is leading the Structural Genomics Consortium. The consortium's work will lay the groundwork for significant medical discoveries and enable scientists to better understand our genetic information and to put the genome to practical use.

CIHR is also supporting the Blueprint Initiative research program led by Dr. Christopher Hogue from Mount Sinai Hospital's Samuel Lunenfeld Research Institute. By entering 80,000 molecular interaction records into a database that researchers can freely access, we will be better able to understand the molecular complexity of cells – the true blueprint of life.

Conclusion

The quality of life of Canadians and their standard of living depend on a collective capacity to innovate. CIHR is leading Canada to the forefront of health and biotechnological innovation. This kind of innovation will not only enhance Canada's competitiveness, but will fundamentally improve the lives of Canadians. Through its coherent and strategic suite of programs designed to create a culture of innovation, CIHR is fueling the pipeline of discovery, catalyzing commercialization, informing healthcare practice and policy and positioning Canada as a vibrant player in this century of health research.

About the Author

Sonya Corkum is the Vice President of Partnerships & Knowledge Translation at the Canadian Institutes of Health Research. In her role, she is responsible for leading the development of CIHR's strategic position in forming beneficial partnerships both nationally and internationally. Ms. Corkum is also heading up CIHR's national vision for systematically moving the results of research into practice.

The Canadian Institutes of Health Research is the Government of Canada's premier agency for health research. Its objective is to excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian healthcare system.

In-kind donations for nonprofits

A report published in the *McKinsey Quarterly* 2003, No. 4 issue states that carefully managed in-kind donations can help non-profits narrow the gap between their aims and resources. The trick, according to the report, is to create long-term partnerships between nonprofits and donor companies and to make the benefits for both sides explicit. This approach allows nonprofits more control over what they receive and when they receive it.