CQDM: Canada on the brain

By Michael J. Haas, Senior Writer

The **Quebec Consortium for Drug Discovery** and **Brain Canada** have announced at least C\$10 million (US\$9.2 million) in funding for a new program to develop tools to accelerate the discovery of neurological disease therapies.

Under the three-year Focus on Brain program, the Quebec Consortium (CQDM) and the not-for-profit Brain Canada will fund collaborative projects at research institutions and small companies across Canada. The goal is to generate tools, technologies and platforms that could enable industry to overcome some of the barriers that impede drug discovery in neurology.

Those problems, said Diane Gosselin, include the challenge of delivering therapies across the blood brain barrier, the lack of preclinical models that predict the efficacy of therapies to treat Alzheimer's disease (AD) and other neurodegenerative indications, and the need for markers to stratify patients for clinical trials and identify who is likely to respond to a therapy.

Gosselin is president and CEO of CQDM.

The partners expect to fund about seven projects and will provide a total of up to C\$500,000 (US\$458,000) annually to each project.

"We have been somewhat vague about the total amount of funding and number of projects because our two organizations have the ability to do more" depending on the quality of project proposals received, Gosselin said.

CQDM receives two-thirds of its funding from the federal and provincial governments and one-third from its pharma sponsors and other partner organizations. Thus, Gosselin said, the consortium can match every \$1 a pharma invests in it with about \$19 additional dollars, thereby giving the pharma \$20 worth of R&D.

"The more pharmas we have, the more leverage we'll have—so it makes sense for us to have as many pharmas as possible," she said.

This month, she said, the consortium expects to disclose the amount of funding a third partner, the **Ontario Brain Institute** (OBI), will provide to the program on top of the C\$10 million (US\$9.2 million) total from CQDM and Brain Canada.

And today, CQDM announced that **Sanofi** joined the consortium as its eighth pharma sponsor.

"We believe that R&D is not a one-company matter anymore," said Marc Bonnefoi, head of the North America R&D hub and VP of the disposition, safety and animal research scientific core platform at Sanofi. Thus, "for the past two to three years, we have been focusing our efforts to tap external innovation in the EU and U.S. Now we want to explore the opportunities for external innovation in Canada, where our R&D has been limited primarily to running clinical trials."

Bonnefoi added, "We chose CQDM because their precompetitive platform merges the interest of academic institutions, small companies and pharmas, and they have very good funding programs."

Pan-Canadian brainstorm

CQDM and Brain Canada are now accepting project proposals for the Focus on Brain program and expect to award the first grants by April 2015.

Gosselin said that Focus on Brain was inspired by the 2012 Quebec/Ontario funding program that CQDM established in partnership with OBI, the **Ontario Centres of Excellence** and **MaRS Innovation** to develop tools for biopharma research. The program also was the consortium's first step in building a network of Canadian researchers outside Quebec.

At that time, CQDM wanted to get more involved in funding neurology projects, she said. Besides a shared interest in neuroscience, "we could see that CQDM and OBI have many of the same goals, including funding of translational research, fostering innovation and working with pharmas."

The two organizations decided to launch a pan-Canadian neuroscience initiative but wanted another partner with experience and connections across Canada. "This is where Brain Canada came in. They have the ability to fund research across Canada, and they have the networks and expertise to help us organize a neuroscience program," Gosselin said.

She added, "CQDM's links with pharma were attractive to Brain Canada because it had been funding mostly academic R&D and wanted to get more into industry and translational research."

Haifa Staiti, director of research programs at Brain Canada, agreed. "This is the first initiative of its kind in which a funding program is encouraging collaborations not

only across Canada but also between academia and industry," she said.

Indeed, the scope of Focus on Brain is in line with CQDM's goal of continuing to raise the visibility of Canadian research and innovation in the eyes of the global pharmaceutical industry, Gosselin said.

"The problems confronting biopharmaceutical R&D are so complex that it would not be wise for us to duplicate the efforts of others by trying to solve them on our own," she said. "Instead, we want to work with groups outside Canada. But in order to position ourselves among other initiatives around the world and form partnerships with them, we first need a strong network of researchers within Canada" that demonstrates what the country can offer on the global stage.

CQDM already has funded six neurology projects outside of the Focus on Brain program. Of these, ongoing projects include one by

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researchers at the **University Institute of Geriatrics of Montreal** for noninvasive imaging of oxidative metabolism in the brain to stratify patients with AD and another by researchers at **Laval University** and **McMaster University** to validate catecholamine-regulated protein 40 (CRP40) as a marker for the early diagnosis of Parkinson's disease (PD). CRP40 is an alternate, 40 kDa splice variant of heat shock 70 kDa protein 9 (HspA9; mortalin-2).

Gosselin noted that CQDM is not involved with the NIH's Brain Research through Advancing Innovative Nanotechnologies (BRAIN) Initiative—which aims to map the human brain to show how individual cells and neural circuits interact—because the initiative will not produce a translation tool or technology that has immediate utility in solving neurology drug discovery problems. But as part of its plan for international expansion, the consortium will continue to evaluate how or whether it could contribute to such large-scale initiatives outside Canada, she said.

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Five years and counting

Since 2008, CQDM has funded a total of 32 projects under 4 of its existing programs, which are called Focus, Explore, Quebec/Ontario and Quebec/France.

Focus is for large-scale, multi-institutional projects within Quebec that will produce immediately usable results. Explore is for innovative and high-risk projects within Quebec that have the potential for a major breakthrough.

The Quebec/Ontario program funds Focus- and Explore-like projects by researchers in both provinces. The Quebec/France program also supports Focus- and Explore-like collaborations, with CQDM funding the research conducted in Quebec and the **Alsace BioValley** cluster funding the research conducted in France.

Of 11 completed projects, 10 achieved the target milestones and deliverables, Gosselin said. She added that results from eight of those projects are in use by one or more of the consortium's pharma partners.

Completed Focus projects include biosensors that predict the efficacy and side effects of drugs targeting GPCRs. The biosensors were developed by researchers at the **University of Montreal**, **McGill University**, **Sherbrooke University** and the **Montreal Heart Institute**. Another completed Focus project is a noninvasive method for stratifying patients with major psychiatric disorders based on retinal responses to photostimulation (electroretinography). The technology was developed by researchers at Laval University and **NDEI Inc.**

Completed Explore projects include a McGill study that found somatic mutations that cause autoimmune diseases such as rheumatoid arthritis (RA) and a computer platform for optimizing the specific interactions between antibodies and their target antigens that was developed by a team at the **National Research Council Canada**.

The one completed Quebec/France project, by researchers from **Caprion Proteomics Inc.** and the **Centre National de la Recherche Scientifique** (CNRS), identified tumor-secreted proteins as new diagnostic and prognostic markers for neuroendocrine cancers.

Gosselin also said that 25 partnerships have been formed between CQDM's academic and industry members outside the scope of CQDM

projects. As an example, she cited an ongoing Focus project mentored by **Merck & Co. Inc.** in which researchers at the Montreal Heart Institute and the **National Institute of Scientific Research** are developing radio-labeled peptides as imaging agents for the early detection of pulmonary hypertension. Based on the team's results so far, Merck has established a separate partnership with the researchers to develop a PET version.

In another partnership, **Pfizer Inc.** and the University of Montreal researcher who led the GPCR biosensor project are developing a drug discovery platform based on that biosensor technology.

To date, cash and in-kind investments resulting from partnerships

among the consortium's members—beyond the scope of a CQDM project—have totaled more than C\$15 million (US\$13.7 million), Gosselin said. In addition, five startup companies have been founded based on the results of CQDM-funded projects.

In addition to newcomer Sanofi, CQDM includes its three founding pharmas—**AstraZeneca plc**, Merck and Pfizer—as well as **Boehringer Ingelheim GmbH**, **Eli Lilly and Co.**, **GlaxoSmithKline plc** and **Novartis AG**.

Pharma sponsors invest equally in CQDM, and the money is applied equally to all projects. In return, the pharmas gain nonexclusive rights to the project results.¹

CQDM also includes researchers at 21 academic institutions and hospitals and 25 private companies in Quebec, Ontario and France.

All CQDM-funded projects are assigned one or more senior scientist mentors from the consortium's pharma sponsors to ensure that projects are progressing in line with industry needs. Gosselin said that Focus on Brain projects will have at least three mentors—each from a different pharma—and could have more depending on the level of interest the remaining pharmas have in a project.

Haas, M.J. *SciBX* 7(23); doi:10.1038/scibx.2014.663

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REFERENCES

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COMPANIES AND INSTITUTIONS MENTIONED

Alsace BioValley, Illkirch, France
AstraZeneca plc (LSE:AZN; NYSE:AZN), London, U.K.
Boehringer Ingelheim GmbH, Ingelheim, Germany
Brain Canada, Montreal, Quebec, Canada
Caprion Proteomics Inc., Montreal, Quebec, Canada
Centre National de la Recherche Scientifique, Strasbourg, France
Eli Lilly and Co. (NYSE:LLY), Indianapolis, Ind.
GlaxoSmithKline plc (LSE:GSK; NYSE:GSK), London, U.K.
Laval University, Quebec City, Quebec, Canada
MaRS Innovation, Toronto, Ontario, Canada
McGill University, Montreal, Quebec, Canada
McMaster University, Hamilton, Ontario, Canada
Merck & Co. Inc. (NYSE:MRK), Whitehouse Station, N.J.
Montreal Heart Institute, Montreal, Quebec, Canada
National Institute of Scientific Research, Montreal, Quebec, Canada
National Institutes of Health, Bethesda, Md.
National Research Council Canada, Ottawa, Ontario, Canada
NDEI Inc., Sainte-Foy, Quebec, Canada
Novartis AG (NYSE:NVS; SIX:NOVN), Basel, Switzerland

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