



Ontario **Genomics** Institute  
The Future is in Our Genes.



## NEWS RELEASE

### **UNIQUE PUBLIC-PRIVATE RESEARCH PARTNERSHIP LEADS WORLD IN DETERMINING 3-D STRUCTURE OF PROTEINS RELATED TO HUMAN DISEASE**

#### **Structural Genomics Consortium reaches project milestone ahead of schedule**

*2 March 2007, Toronto* – The Structural Genomics Consortium (SGC), an international research effort set up in 2004 to determine the three-dimensional structures of proteins relevant to human disease, today posted its 375<sup>th</sup> protein structure in the public domain. The SGC, which is the largest international research project ever directed from Canada, operates from laboratories at University of Toronto, University of Oxford, and Karolinska Institutet, Stockholm. All three sites have achieved their output goals ahead of schedule.

#### **SGC Toronto reaches initial output goal with protein associated with cancer and eye disease**

The Toronto-based laboratory, led by Chief Scientist, Dr. Cheryl Arrowsmith, reached its three-year goal of depositing 175 structures in the World Wide Protein Data Bank (wwPDB) earlier this week. A mission of the wwPDB is to maintain an archive of protein structural data that is freely and publicly available to the global community. This landmark protein structure – of Axl-2 – is implicated in cancer as well as, in a mutated form, retinitis pigmentosa, a group of genetic eye disorders characterized by loss of vision and accumulation of pigment in the retina. The University of Toronto laboratory has also made major contributions to understanding the structures of proteins involved in diabetes and malaria.

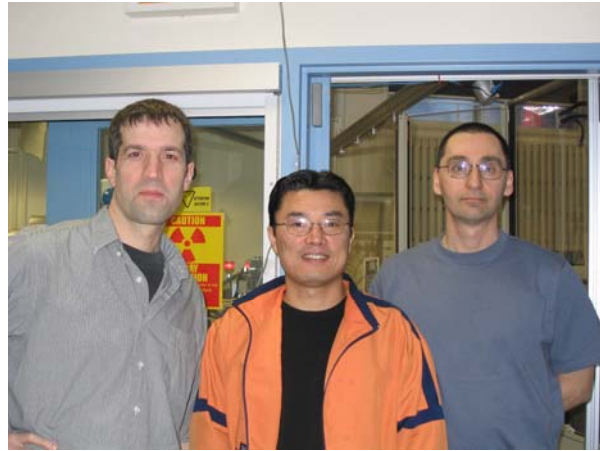
“The SGC team here in Toronto is really excited by the impact our structural work is having in the biomedical research community,” said Arrowsmith. “It is very rewarding to be able to see directly from the structures how drugs and biologically active molecules “fit” into the proteins and affect their activity.”

“The places that invest in innovation most effectively will be home to the most rewarding jobs, strongest economies, and best quality of life,” said Dalton McGuinty, Ontario Premier and Minister of Research and Innovation. “This made-in-Ontario success story demonstrates the power we can harness by openly sharing knowledge to speed scientific discovery and the commercialization of research for the benefit of people across our province and the world.”

“Like the information provided by the Human Genome Project (HGP), the structural information provided by the SGC is both fundamental to the understanding of human health and to the discovery of new medicines,” said Dr. Christian Burks, President and CEO of the Ontario Genomics Institute (OGI). “The SGC approach is emblematic of the new research paradigm in the life sciences. It focuses, like the HGP, on generating fundamental resources to accelerate research and development. The SGC’s systematic approach to determining human protein structures and structures related to diseases such as malaria and the outcome of depositing them in the public PDB, carries science into the next frontier,” Burks added.

The SGC is on track to post 400 new structures of human proteins to the wwPDB by July 2007, accounting for approximately one-third of the new human protein structure output of the entire

world over the life of the SGC. “I am very pleased and excited that Ontario's investment in SGC, partially through the Ontario Innovation Trust, is helping to solidify our place as a world-class centre for innovative research and scientific discovery,” said Dr. Cal Stiller, Chair of the Ontario Innovation Trust (OIT). “Canada is at the forefront of genomics research - creating the knowledge, developing the products, seizing the opportunities and reaping the benefits of this remarkable area of science.”



The team that solved the Axl-2 structure:  
Drs. Sirano Dhe-Paganon, Xudong Huang and John Walker

### **Ontario biotechnology company using SGC structure to speed drug development**

The implications for world health and science are enormous. One Ontario-based biotechnology company has already benefited from SGC's efforts. Cytochroma Inc. aims to develop inhibitors to human enzymes called cytochromes P450. Their current research focuses on human enzymes that synthesize and degrade Vitamin D. Until now, the mechanisms by which compounds interact with these enzymes have been obscure.

“The SGC recently determined and is making freely available, the first 3-D structure of a human cytochrome involved in vitamin D metabolism,” says Dr. Martin Petkovich, Chief Scientific Officer of Cytochroma Inc. “This is not only important science, but because the data are freely available, the Cytochroma chemists can use the structural information to expedite the development of new chemical entities in our new drug discovery efforts. We believe that our chemists have proprietary skill in this research area and the availability of the crystal structures will only increase their competitiveness relative to the international competition.”

SGC has transformed the world's approach to understanding the molecular basis of human health and disease, says Dr. Alan Bernstein, President of the Canadian Institutes of Health Research (CIHR), a major funder of the project. “It is an important effort that seeks to unlock the secrets of the proteins that make all living organisms work. Because human health transcends international borders, global initiatives like the SGC are helping researchers everywhere understand and develop new treatments for diseases that affect people around the world,” added Dr. Bernstein. “The freely accessible information made available by the SGC will help researchers in Canada and around the world pursue cutting-edge work in areas as diverse as diabetes, cancer and malaria.”

### **Unique research model brings together international public and private partners**

The SGC is a model for how the public and private sectors can collaborate to carry out biomedical research in the public interest. “The SGC comprises multiple scientific sites, multiple

institutions and multiple funders, all aligned toward a common objective” notes project leader Dr. Aled Edwards, who heads up the SGC from the University of Toronto. “I, along with the chief scientists at all three sites, believe without a doubt that this organizational structure, while complex, is a major source of our scientific strength, the key to our success, and a model for international cooperation and coordination. The SGC shows that Canada can lead the world in a core area of pharmaceutical research, and this will doubtless spur economic and scientific developments in the years to come”

### **Leading American crystallographer named new Board Chair of SGC**

In keeping with the international scope of the SGC, it has appointed Dr. Wayne Hendrickson of Columbia University in New York City its incoming Chairman of the Board, effective 1 March 2007. Hendrickson is one of the world’s leading crystallographers. He has been on the faculty of the Department of Biochemistry and Molecular Biophysics at Columbia since 1984. In addition to being a member of the National Academy of Sciences, he has been the recipient of several awards including the Alexander Hollaender Award of the National Academy of Sciences, the Christian B. Anfinsen Award of the Protein Society, the Merit Award of the National Institutes of Health, the Academy Medal, New York Academy of Medicine (2003), the Gairdner Award (2003), the Paul Janssen Prize (with M. G. Rossmann) from Rutgers University (2004), and the Harvery Prize, Technion - Israel Institute of Technology (2004).

David Naylor, President of the University of Toronto, was a member of the panel that recommended Dr. Hendrickson for the 2003 International Gairdner Award. “Wayne Hendrickson is an absolutely outstanding scientist, and his decision to take the Chair of the SGC underscores the international scope and importance of this Canadian-led project,” Naylor said.

“We are creating the intellectual infrastructure to attract world-class scientists and leading-edge pharmaceutical industry investment to Ontario,” said Edwards. Whereas GSK was the only private sector funding body in Phase I, Edwards says there are now three leading international pharmaceutical companies interested in investing in the consortium. “Having structural information can cut the time it takes to bring a drug to market by up to 18 months. This translates into people getting potentially life-saving or health-improving drugs much earlier,” says Edwards.

### **Select SGC structures on display for the world as neon glass art in London, England**

Not only are the structures being posted to the wwPDB. Four of the structures, including those associated with malaria, cancer and HIV are part of a neon glass art exhibit on display in the windows of The Wellcome Trust headquarters in London, England. The life-size glass sculptures, created by London designers Graphic Thought Facility, were unveiled in the new building in December 2006. The installation, visible to thousands of pedestrians who walk along Euston Road each day, will be in place until this summer.

For more on this exhibit, see [Wellcome Windows](#).

### **About the SGC**

The Structural Genomics Consortium (SGC) is a not-for-profit organization formed in July 2004. The SGC receives funding from Canadian, Swedish and British sponsors representing both the public and private sectors: The Wellcome Trust, GlaxoSmithKline (GSK), Genome Canada through the Ontario Genomics Institute (OGI), Ontario Research and Development Challenge Fund (ORDCF), Ontario Innovation Trust (OIT), Canadian Institutes of Health Research (CIHR) and a consortium of Swedish sponsors (Swedish Foundation for Strategic Research (SSF), the Knut and Alice Wallenberg foundation (KAW), the Swedish Governmental Agency for Innovation Systems (VINNOVA) and Karolinska Institutet).

## **SGC Toronto**

The 75 SGC Toronto scientists seek to determine the three-dimensional structures of human proteins of therapeutic relevance to diseases such as cancer, malaria and metabolic disorders. SGC Toronto has a particular focus on proteins involved in intracellular small molecule metabolism, enzymes involved in the transfer of methyl, acetyl and ubiquitin-like groups, proteases and nucleotide triphosphatases. The Toronto laboratory is also investigating proteins from *Plasmodium falciparum* (and its apicomplexan relatives), which causes malaria.

The SGC Toronto laboratories are housed within the Faculty of Medicine at the University of Toronto. Scientists at SGC Toronto are affiliated with several University Departments including the Banting and Best Department of Medical Research, the Departments of Physiology, Pharmacology, Medical Biophysics, and Medical Genetics and Microbiology.

## **SGC Oxford**

The other original SGC site, part of the University of Oxford, specializes in identifying the structures of particular protein families, such as protein kinases, GTPases, and oxidoreductases. 65 scientists work from the Oxford site. The Chief Scientist at SGC Oxford is Dr. Michael Sundström.

## **SGC Stockholm**

The Stockholm laboratory was established in 2005 after funding amounting to 80 MSEK had been provided by the Swedish Foundation for Strategic Research (SSF), the Knut and Alice Wallenberg foundation (KAW), the Swedish Governmental Agency for Innovation Systems (VINNOVA) and Karolinska Institutet. The laboratory is hosted by the Department of Medical Biochemistry and Biophysics at Karolinska Institutet. Currently 25 researchers are employed by the project. The Chief Scientists at SGC Stockholm are Drs. Pär Nordlund and Johan Weigelt.

## **About OGI**

The Ontario Genomics Institute (OGI) is a private, not-for-profit corporation focused on providing leadership to build a globally-competitive life sciences industry in Ontario. Through its relationship with Genome Canada, Ontario Ministry of Research and Innovation (MRI), and other private and public sector partners, OGI helps Ontario-based scientists secure funding for research in genomics and proteomics as well as for commercialization activities. OGI has a \$500 million portfolio of 33 leading-edge genomics and proteomics research projects including the SGC. OGI also focuses on the potential ethical and social issues that can arise with and from such research.

For more about OGI, go to [www.OntarioGenomics.ca](http://www.OntarioGenomics.ca)

### **Notes to editors:**

**For more information on the SGC, in each of the three countries, go to:**

**SGC Toronto – [www.sgc.utoronto.ca](http://www.sgc.utoronto.ca)**

**SGC Oxford – [www.sgc.ox.ac.uk](http://www.sgc.ox.ac.uk)**

**SGC Stockholm – [www.sgc.ki.se](http://www.sgc.ki.se)**

**For more information on the World Wide Protein Data Bank, go to [www.wwpdb.org](http://www wwpdb.org)**

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