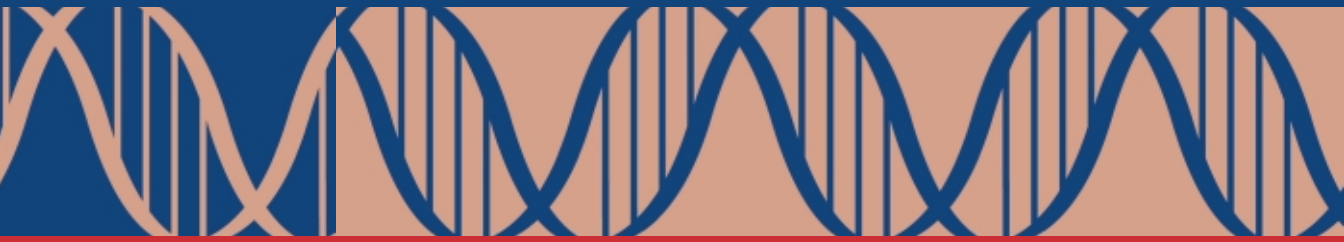
CANADIAN GENETIC DISEASES NETWORK

BUILDING A HEALTHIER FUTURE.

ANNUAL REPORT 2002



From Genes to Therapies

The Canadian Genetic Diseases Network (CGDN) is a not-for-profit corporation. Our mission is to be the primary catalyst in advancing Canada's scientific and commercial competitiveness in genetic research and the application of genetic discoveries to the prevention, diagnosis and treatment of human disease.

Our network:

- Funds leading edge research in genetics.
- Facilitates collaborative research in human genetics across Canada, enabling more discoveries and better science.
- Educates emerging scientists to excel in human genetic disease research.
- Facilitates partnerships between biotechnology and pharmaceutical companies to translate research discoveries into therapies or diagnostic tests.

Our scientists and their teams are based in 18 universities, hospitals, and research centres across Canada, and form the basis of the CGDN nation-wide network. Our projects and core technology facilities advance the molecular and cellular knowledge of common diseases such as Alzheimer's, heart disease, diabetes, and cancer. And, our discoveries in genetic research are undergoing development into commercial products by both new and existing biotechnology companies.

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Letter to Stakeholders

2002 – A FOUNDATION FOR THE FUTURE

This year has been the first for CGDN operating under our new mission statement. The mission statement was designed to provide a framework for future growth in a changing environment, and, as anticipated, it has acted as a focal point for positive discussion. This reporting year has been a year of planning for sustainability– a satisfying year of building on the successes of a first-class research programme. Such forward thinking is an essential part of the evolution of the CGDN.

In the spring of 2001, CGDN underwent a scheduled funding review by the Networks of Centres of Excellence (NCE) programme. The international review panel delivered a resoundingly positive report and funding was secured until the completion of the 14 year NCE funding programme in 2005.

The review panel was unanimous in honouring CGDN for our accomplishments over the past 10 years. It concluded CGDN 'sets the gold standard for an interactive research programme in human genetics, for collaborative graduate and postgraduate training in genetics and for implementing processes for the transfer of research and biotechnology to the private sector'.

CGDN is focused on finding alternative sources of funding which will enable it to continue this important work beyond 2005, to ensure Canadian discoveries make a real difference to global healthcare.

In the body of this annual report there are more details of the accomplishments of this reporting year. CGDN can once again recount significant achievements in all our core functions.

Research Excellence

In this reporting period network scientists published more than 350 peer-reviewed papers in such prestigious journals as *Nature Genetics*, *Nature Cell Biology*, and *Science*. New genes discovered by our scientists include: a susceptibility gene for prostate cancer that may also have implications for other forms of cancer; a gene that may present a new therapeutic target for coronary artery disease; and a gene causing the juvenile form of Lou-Gehrig's disease (ALS2) that has important implications for the understanding of neurodegenerative diseases in general.

There were also important advances in the understanding of the disease mechanisms that lead to diabetes, Huntington's disease and cancer. Work conducted by CGDN senior researcher Dr. Robert Hegele at the J.P. Robarts Research Institute in London, which linked defective nuclear structure and diabetes, was cited in the American Heart Association's Top Ten Research Advances for 2001.

To enhance our collaborative research program, the network signed an international agreement with the Karolinska Institute, in Stockholm, Sweden, to develop research collaborations in human genetics. Another agreement between CGDN, CIHR Institute of Genetics and the Maxx Planck Institute in Germany was signed to accelerate the discovery of disease causing genes, to the benefit of citizens worldwide.

Training

CGDN prides itself on developing innovative interdisciplinary training programmes to enhance Canada's genetic research infrastructure.

For example, the Canadian Bioinformatics Workshop (CBW) programme over the past 3 years has significantly improved Bioinformatics capabilities within Canada. This national short-course programme, which brings together the disciplines of biology, computer science and mathematics, expanded to include five workshops in 2001-2002. The NCE evaluation panel proclaimed the CBW to be 'unique, well structured and an important national training resource.' To meet demand for future courses CGDN launched an active mentoring programme, partnering experienced instructors with their junior colleagues. As a result, new instructors will be available in 2003. CGDN also encourages hands-on training by providing grants to scientists who wish to train in other CGDN laboratories across Canada.

CGDN awarded 20 summer studentships in 2001, and currently supports nine Network Scholars. Last year, the network partnered with the Canadian Gene Cure Foundation and the CIHR Institute of

Genetics to create a $1million MD/PhD scholarship programme . This programme will, in the long-term, increase the number of young clinician scientists who are committed to genetic research.

The CGDN Annual Meeting is seen as an occasion for education and training. In April 2001, more than 70 graduate students enjoyed the opportunity to meet with CGDN scientists and exchange ideas on research.

Commercialization

An important part of the CGDN mandate is the translation of discoveries into advances in healthcare. Our commercial activities include protecting discoveries by filing patents, strengthening patent claims through the provision of strategic grants, and identifying development partners.

In 2001-2002 CGDN awarded Core and Strategic Grants in excess of $3 million that resulted in 11 patent applications and three licensing agreements .

The network has been tremendously successful in attracting industry partners. CGDN organised “research exchange days” with Novartis Ophthalmics at which CGDN principal investigators and industry partners presented their ocular research programmes. So far, these initiatives have resulted in two research agreements valued at $196,000 per year. Other agreements are currently under negotiation.

CGDN plans to continue to build on its successes. We have a strong record of funding early stage research with commercial potential. We have fostered and encouraged collaboration between academia, government and industry. We have a commercial strategy that allows the timely translation of knowledge into tangible healthcare advances.

CGDN will continue to play a significant role in the advancement of genetic understanding, the economic growth of the life sciences sector in Canada and the improvement of both national and global healthcare.

The Rt. Hon.
Don Mazankowski, PC, OC
Chairman of the Board

Dr. Michael Hayden
Scientific Director

Dr. Ron Woznow
Chief Executive Officer

Don Mazankowski, PC, OC
Chairman of the Board

Michael Hayden, MB, ChB, PhD, FRCP(C), FRSC
Scientific Director

Ron Woznow, PhD
Chief Executive Officer

Research and Discovery

The Strategic Roadmap for Network Science

CGDN investigators collaborate on integrated projects in four major theme areas. This structure is designed to promote gene discovery, increase our understanding of how variations in genes cause disease, and facilitate the application of this knowledge to create real improvements in health care. Our scientific research promises to deliver innovative approaches, in the form of diagnostics and therapies, for effectively treating genetic diseases both in Canada and throughout the world.

Gene Identification

Researchers

D. Cox, M. Walter (Edmonton); R. Hegele (London); B. Triggs-Raine (Winnipeg); P. Gros, W. Foulkes, K. Morgan, G. Rouleau, E. Skamene, E. Schurr (Montreal); J. Danska, R. McInnes, B. Robinson, J. Rommens, S. Scherer, K. Siminovitch, P. St George-Hyslop, L-C. Tsui (Toronto); M. Hayden, L. Field (Vancouver)

Projects

Gastrointestinal diseases	Inflammatory bowel disease, liver diseases including Wilson disease and alpha1-antitrypsin deficiency
Diabetes	IDDM, NIDDM
Metabolic Disorders	Mitochondrial deficiencies, Cytochrome oxidase deficiency, Respiratory chain defects
Cardiovascular diseases	HDL deficiency, intracranial aneurysm, familial partial lipodystrophy, athlerosclerosis
Neurological disorders	Dyslexia, Alzheimer's disease, familial dementia, Williams-Beuren syndrome, stroke
Bone & joint disorders	Rheumatoid arthritis, osteoporosis
Susceptibility to infection	Legionnaires' disease, CMV, leprosy, malaria, salmonella, tuberculosis
Ocular diseases	Glaucoma, developmental eye defects
Cancer	Hereditary Breast Cancer, protection against oxygen free radicals
Respiratory diseases	Cystic Fibrosis

Pathogenesis & Functional Genomics

Researchers

F. Jirik, R. Gravel (Calgary); J. Wilkins, G. Hicks (Winnipeg); T. Hudson, G. Mitchell, G. Rouleau, R. Rozen (Montreal); A. MacKenzie, R. Korneluk (Ottawa); F. Rousseau, R. Drouin (Quebec); B. Gallie, D. MacLennan, R. McInnes, P. St.George-Hyslop (Toronto); M. Hayden, P. Hieter, F. Ouellette (Vancouver)

Projects

Cancer	Retinoblastoma, folate metabolism and tumours, ovarian cancer
Cell & neuron death	Apoptosis, Alzheimer's disease, Huntington's disease, Fragile X syndrome, Tay-Sachs and Sandhoff diseases
Metabolic disorders	Obesity, diabetes
Neuromuscular disorders	Calcium regulation and muscle disease, myotonic dystrophy, spinal muscular atrophy, inherited epilepsy
Functional genomics	SAGE analysis, DNA arrays, bioinformatics of ES cell mutations, Tagged-Sequence Mutagenesis

Genetic Therapies

Researchers

C. Scriver (Montreal); R. Worton (Ottawa); J. Dick, C. Roifman, L-C. Tsui (Toronto); L. Clarke, P. Cullis, M. Hayden, F. Tufaro (Vancouver)

Projects

Technology development	Viral vectors: HSV, stem cells; liposomal plasmid delivery
Applications	Murine tumour models, LPL deficiency, cystic fibrosis, Duchenne muscular dystrophy, human immunodeficiency diseases, enzyme substitution for phenylketonuria and mucopolysaccharidosis type 1.

Genetics & Health Care

Researchers

C. Scriver (Montreal); B. Gallie, K. Morgan, S. Narod, L-C Tsui (Toronto)

Projects

Technology development	Databases
Mutations	Mutation detection
Impact / Evaluation	Meta-analysis of treatment of hereditary diseases, retinoblastoma, breast cancer

Core Technologies

Facilities & Directors

Genotyping	T. Hudson (Montreal)
DNA sequence analysis	M. Hayden (Vancouver), B. Koop (Victoria), S. Scherer (Toronto)
Bioinformatics & BIND database	F. Ouellette (Vancouver)
Transcribed sequence detection	J. Rommens (Toronto)
Genome alteration in mice	B. Leavitt (F. Jirik) (Vancouver), Corrine Lobe (A. Nagy, J. Rossant) (Toronto)
Genome alterations in C. elegans	J. Culotti (Toronto)
In vivo DNA analysis	R. Drouin (Quebec)
Immunoprobes	J. Wilkins (Winnipeg)
Proteomics	K. Ashman (Toronto)

Scientific Achievements

"To be the primary catalyst in advancing Canada's scientific and commercial competitiveness in genetic research, and the application of genetic discoveries to the prevention, diagnosis and treatment of human disease."

To fulfill its objectives, the CGDN focuses its scientific research on four interrelated themes: Identification of the Genetic Basis of Human Disease; Pathogenesis and Functional Genomics; Genetic Therapies; and Genetics and Health Care. Our scientists published more than 350 peer-reviewed articles in 2001–2002, some of which are detailed below. This scientific research has the potential to improve health care for Canadians, and for others around the globe.

THEME 1 – Identification of the Genetic Basis of Human Disease

Identifying the genetic basis of human disease is a key competence of our network. There are two ways in which the discovery of a disease gene will confer benefits to the Canadian Health care system: diagnostics and therapeutics.

Identification of disease genes enables doctors, through new diagnostic tests, to recognize individuals who are at risk of developing a genetic disease. "At risk" individuals will receive a higher level of surveillance for early manifestation of the disease, improving their clinical prognosis.

Identification of disease genes also provides insight into the function of these genes, in both normal and disease situations, increasing our understanding of the complex mechanisms of the human body. Knowledge of the mechanism underlying a genetic disease is critical for the development of new therapeutics, designed to improve the quality of life for patients.

Prostate cancer: Identification of a susceptibility gene.

(J. Rommens, Hospital for Sick Children, Toronto)

Prostate cancer was the most frequently diagnosed cancer in Canadian men in the year 2001. While there are many known genetic contributors in prostate cancer, the late age of onset for the disease has made identification of these genes particularly difficult. An analysis of families with a high-risk of developing prostate cancer has led to the identification of one prostate cancer gene, ELAC3 on chromosome 17p. This gene contributes to prostate cancer susceptibility, which means that people with a particular variation in this gene have an increased risk of prostate cancer. There is some evidence to suggest that this gene may also confer a susceptibility to other cancers, such as ovarian cancer. Understanding how this gene contributes to prostate and other cancers provides insight into potential therapies for these diseases. *(Nature Genetics February 2001).*

Crohn's Disease – localisation of a candidate susceptibility gene locus.

(K. Siminovitch, Samuel Lunenfeld Research Institute, Toronto; T Hudson, McGill University, Montreal)

Crohn's Disease is a type of inflammatory bowel disease characterised by inflammation, deep ulcers and scarring to the small intestine or colon. Crohn's Disease is sometimes associated with other inflammatory conditions affecting the joints, skin and eyes. An approach called Linkage Disequilibrium (LD) mapping was used to localise the genes for this rare disease. While a single causative mutation for Crohn's Disease was not identified, a region was localised to chromosome 5q31, which also contains the IBD5 gene locus. This area contains a cytokine gene cluster, and it is possible that the genes in this area may contribute to other inflammatory diseases associated with Crohn's. These results have important implications for Crohn's Disease in particular and highlight the importance and utility of the LD mapping approach in identifying rare disease genes.
(Nature Genetics, October 2001).

Discovery of a gene implicated in adult-onset primary open-angle glaucoma

(E. Heon, University Health Network, Toronto)

Primary open-angle glaucoma (POAG) is the most common form of Glaucoma, affecting 33 million individuals worldwide. This study identified one of the genes responsible for adult-onset POAG, called *OPTN*, for 'optineurin', at chromosome 10p14. Mutations in this gene were identified in 16.7% of families with hereditary POAG. The gene codes for a conserved protein of unknown function, which interacts with diverse proteins such as Huntingtin, Ras-associated protein RAB8, and transcription factor IIIA. The protein is speculated to play a neuroprotective role in the eye and optic nerve, and when mutated, causes a loss of vision and neuropathy seen in glaucoma. Not only does the discovery of this gene give insight into important signalling pathways within the cell, but potentially provides a useful tool for presymptomatic disease screening. *(Science, February 2002)*.

Familial amyotrophic lateral sclerosis 2 (ALS2): identification of a gene causing the juvenile form of the disease.

(S. Scherer, Hospital for Sick Children, Toronto; G. Rouleau, McGill University, Montreal; M. Hayden, Centre for Molecular Medicine & Therapeutics, Vancouver; J. Ikeda, University of Ottawa & Tokai University, Japan).

ALS, the most prevalent adult-onset neurological disorder after Alzheimer's and Parkinson's diseases, manifests with selective loss of motor neurons in the brain and spinal cord, and leads to progressive muscle weakness. Although most reported cases of the disease are sporadic, 5-10% of ALS cases are caused by a heritable genetic mutation in the ALS2 gene. An analysis of *ALS2* shows that the gene is expressed throughout the brain and spinal cord, and that the protein is likely to function in cell microtubule assembly, membrane organisation and intracellular trafficking. Not only does this research increase our understanding of ALS, it has a wider impact on the understanding of all neurodegenerative diseases. *(Nature Genetics, October 2001).*

Characterisation of a novel metabolic syndrome and localisation of the critical genetic area.

(T Hudson, McGill University, Montreal; B Robinson, Hospital for Sick Children, Toronto)

Several patients with a previously uncharacterised, inherited, metabolic disorder were analysed. A detailed examination of this metabolic abnormality demonstrated a dysfunction in several mitochondrial enzymes. A technique called functional complementation analysis using micro-cell mediated chromosome transfer was used to localise the underlying molecular defect to chromosome 2p14-2p13. An investigation of this region of the chromosome has not yielded any obvious candidate genes for the disease. However, network scientists continue to work in this area. This study illustrates how rare and unfamiliar disorders can be characterised and potentially treated in the future. *(American Journal of Human Genetics, February 2001).*

Neural tube defects – identification of a candidate gene in mouse.

(P. Gros, McGill University, Montreal)

Neural tube defects (NTDs) such as spina bifida and anencephaly are common birth defects in humans (1/1,000 births). Both genetic and environmental factors play a role in the development of NTDs. The genetic basis of this disease has been extensively studied in mouse models. In particular, Loop-tail (Lp) is a mouse with a genetic mutation that exhibits characteristics similar to humans with neural tube defects. Analysis of this mouse resulted in the identification of Ltap, a gene that has subsequently been shown to play an important role during murine embryonic development. It is likely that a similar gene exists in humans, and it is believed to be located on chromosome 1q. This study represents a novel entry point for initiating a parallel search for mutations that may be associated with sporadic and familial NTDs in humans. *(Nature Genetics July 2001).*

THEME 2 – Pathogenesis and Functional Genomics

The human body operates like a complex machine. Thousands of intricate components – genes – work together to form interdependent networks and systems. Genetic diseases are the consequence of failure at some point in this integrated web. The root cause is

Scientific Achievements

not necessarily obvious, often masked by the complexity of the system. In order to develop innovative therapies that target genetic diseases, it is essential to understand how genetic mutations lead to the manifestation of disease, and how genes function in the context of the whole genome. This is the study of pathogenesis and functional genomics.

Assigning functions to every gene in the murine genome.

(G. Hicks, University of Manitoba, Winnipeg; J. Rossant, University of Toronto, Toronto)

While the entire human genome and much of the mouse genome have already been sequenced, the fundamental biological function of much of the genome is not evident from examining its DNA sequence. The International Mouse Mutagenesis Consortium (IMMC) aims to systematically and comprehensively assign functions to every gene in the murine genome, and to identify every gene affecting traits of high biomedical interest. With commitments from the academic research community, the IMMC's goal is to create a biological operating system in support of research into mammalian biology, to democratise the access to tools and reagents, and to allow open sharing of information and resources. This process will lead to the identification of new mouse models that can be used to study human diseases. *(Science, February 2001).*

Williams-Beuren syndrome – identifying a mutation with important implications.

(LC.Tsui, S. Scherer, Hospital for Sick Children, Toronto)

Williams- Beuren Syndrome (WBS) occurs in 1 of every 20,000 individuals and is characterised by a disparate cluster of symptoms that include congenital vascular and heart disease, growth deficiency, and mental retardation. An analysis of WBS patients using fluorescence *in situ* hybridization (FISH) and pulsed-field gel electrophoresis (PFGE) provided evidence of a newly identified genomic variant within the WBS population that may be associated with the disease. This novel genomic variant leads to disturbances in meiosis, predisposing the cell to chromosome rearrangements in future generations. This discovery provides new insights into the mechanism underlying the disease and demonstrates the utility of the FISH and PFGE techniques for clinical diagnosis of genetic disorders. *(Nature Genetics, October 2001).*

Coronary artery disease (atherosclerosis): common genetic variations in the ABCA1 gene can indicate an individual's risk for coronary artery disease.

(T. Hudson, McGill University, Montreal; M. Hayden, Centre for Molecular Medicine and Therapeutics, University of British Columbia, Vancouver)

Coronary artery disease (CAD) generally refers to the accumulation of cholesterol, calcium and abnormal cells in the inside walls of the coronary arteries. CAD is associated with low levels of HDL cholesterol and high levels of triglycerides (TG). The major gene underlying HDL cholesterol deficiency was recently discovered to be ABCA1. An extensive analysis of specific mutations within this gene has determined that genomic variations in the ABCA1 gene are associated with altered plasma lipid levels and an increased risk of CAD. Not only does this discovery provide insight into the mechanisms contributing to CAD, it validates this gene as a therapeutic target. *(Circulation, March 2001).*

Infectious diseases: identifying susceptibility genes for malaria and cytomegalovirus infections.

(E. Skamene and P. Gros, McGill University, Montreal)

Cytomegalovirus, the leading cause of congenital viral disease, is the most important opportunistic infection in immunocompromised patients. Malaria is an infectious disease which kills one child in the world every 30 seconds. Susceptibility to both diseases is known to have environmental and genetic components. The *Klra8* gene at the murine Cmv1 locus was identified; mutations in this gene influence susceptibility to cytomegalovirus infection. This gene encodes a family of cell surface receptors that interact and form part of the immune response to the virus. A new malaria susceptibility locus (Char 4) was identified on mouse chromosome 3. The search for human gene equivalents, on the 12p13 and 19q13 chromosomal regions for cytomegalovirus and the 4q21-q25 chro-

mosomal regions for malaria, is currently underway. Identifying these genes in humans and understanding their roles in infection may provide us with new ways to overcome these diseases. *(Nature Genetics, May 2001, PNAS September 2001).*

Spinal Muscular Atrophy: the neuronal apoptosis inhibitory protein is a direct inhibitor of caspases 3 and 7.

(A Mackenzie, University of Ottawa)

Spinal muscular atrophy (SMA) is one of the most common inherited neurodegenerative diseases, characterized by a progressive loss of motor neurons and the wasting of voluntary muscles. Patients with SMA are classified into three types based on the age of onset, severity and clinical progression. The neuronal apoptosis inhibitory protein (NAIP), a candidate gene for SMA, plays a role in the regulation of neuronal apoptosis. This research demonstrated that NAIP protects neurons undergoing caspase-dependent cell death by selectively inhibiting the activity of effector caspases. Specifically, specific BIR (baculovirus inhibitor of apoptosis repeats) domains in the protein are potent inhibitors of effector caspases. Interestingly, a significant number of SMA patients have deletions in the NAIP gene that would either lead to an absence of the NAIP protein or lead to a protein without the BIR domain, which would impair or abolish the ability to inhibit caspases, resulting in increased levels of death in the neurons. This knowledge offers new insights into potential therapies for this disease, and others that are characterized by neuron death. *(The Journal of Neuroscience, March 2002)*.

Huntington's disease: examining disease mechanisms.

(B. Leavitt, M. Hayden, Centre for Molecular Medicine and Therapeutics, University of British Columbia, Vancouver)

Huntington's disease (HD) is a degenerative brain disorder for which there is, at present, no effective treatment or cure. Huntingtin is a very large protein that is mutated in HD. Normally, the function of the huntingtin protein is to increase the expression of brain-derived neurotrophic factor (BDNF), a factor necessary for survival of striated neurons in the brain. When the protein is mutated in HD, this activity is lost resulting in decreased production of BDNF, and the death of striated neurons. Restoring normal huntingtin activity and increasing BDNF production are just two approaches that may be used in the future to treat Huntington's disease. *(Science July 2001).*

THEME 3 – Genetic Therapies

In many cases effective cures do not exist for inherited disorders. Thus, CGDN's work on genetic therapies has the potential for substantially improving quality of life and for contributing to the efficient use of health care resources. Our network scientists employ a multifaceted approach to investigate and evaluate potential gene-based therapies. The primary objective of this research is to advance gene-based treatments for human diseases to improve clinical outcomes.

Cancer pathways – identifying genes regulating signalling pathways in the cell.

(R. Korneluk, Children's Hospital of Eastern Ontario, Ottawa)

A loss of balance and regulatory control within the cell contributes to cancer. Many different types of proteins control the regulatory processes in the cell, including the IAP family of proteins. A potential anti-cancer gene, XAF1 (for XIAP-associated factor 1) was identified on the basis of its ability to bind to one member of the IAP family, XIAP. XAF1 is universally expressed in normal tissues, where it binds to the XIAP proteins, controlling their localisation to the nucleus. In contrast, cancer cells express very little XAF1 protein to regulate the activity of XIAP, which leads to a loss of control over apoptotic signaling. This discovery offers insight into the complex regulatory pathways involved in the cell, and points to therapeutic targets for particular types of cancer. *(Nature Cell Biology 2001).*

THEME 4 – Genetics and Health Care

Research projects in the Genetics and Health Care theme apply mutation identification strategies to identify, prevent, or modify the impact of genetic diseases. The creation and linkage of large databases are essential tools in this process, along with development of sensitive and rapid technologies for DNA testing for specific diseases.

Scientific Achievements

Examining the impact of genetic research on Health Care for Canadians
(C. Scriver, Montreal Children's Hospital Research Institute, Montreal).

The impact of genetics research on health care was examined in two separate papers. Studies of populations in Quebec combining both social (historical and cultural) and genetic (molecular) approaches have revealed valuable knowledge of how genes associate and are passed to subsequent generations. These studies have benefited the populations studied by providing data on the incidence and regional distribution of patients. This data enables health care services, including disease carrier screening, cascade screening, and counseling on reproductive options, to be targeted more efficiently. This study demonstrates the benefits of integration between family and molecular medicine.

A review of the advances in the genomic research field in the last 10 years strongly emphasised the importance of dealing with genetic disease in Canadian populations, families and individuals. While the incidence of genetic disease has remained constant in the last decade, both life expectancy and the Canadian population have increased. This paper referred to the Science Council of Canada Report 42, published in 1991, which made two principal recommendations: that the provincial health ministries assemble committees to advise on the timely and efficient delivery of health services; and that federal and provincial ministries establish a joint multi-disciplinary committee representing users, planners and providers of health care, to address how genetics be better developed to benefit Canadian Health Care. These recommendations are as relevant now as they were a decade ago.

(Human Genetics: Lessons from Quebec Population. Annual Review of Genomics and Human Genetics. 2001; Genetic disease: An orphan in Canadian Health Care, ISUMA, Canadian Journal of Policy Research, 2001).

The Honour Roll

Recognition of Excellence in Research

In 2001, CGDN scientists and their teams received top Canadian and international awards for excellence in science.

AWARDS RECEIVED BY INVESTIGATORS

L'Académie des Grands Montréalais
Prix d'excellence:
Charles Scriver, McGill University

Alberta Heritage Foundation for Medical Research
Medical Scientist Award:
Frank Jirik, University of Calgary

ASHG Award for Excellence in Human Genetics Education
Charles Scriver, McGill University

The Association for Research in Vision and Ophthalmology Cogan Award
Michael Walter, University of Alberta

Burroughs Wellcome Visiting Professorship in the Basic Medical Sciences
Steve Scherer,
Hospital for Sick Children

Canada Institutes of Health Research
Distinguished Scientist Award
Peter St. George-Hyslop,
University of Toronto

Canada Institutes of Health Research
Institute of Genetics Internal Advisory Board, vice-chair
Francois Rousseau, Laval University

Canada Research Chair in Cell Biology
Geoff Hicks, University of Manitoba

Canada Research Chair in Transgenic Research
Frank Jirik, University of Calgary

Canadian Cystic Fibrosis Foundation
Zellers Senior Scientist Award
Lap-Chee Tsui,
Hospital for Sick Children

Canadian Medical Hall of Fame
Charles Scriver, McGill University

Canadian Neurological Society
Richardson Lectureship
Peter St. George-Hyslop,
University of Toronto

CSCI/RCPSC Henry Friesen Award
Charles Scriver, McGill University

The Honour Roll

Czech Learned Society Fellow
Emil Skamine, McGill University

E.W. R Steacie Memorial Fellowship, NSERC 2001
Ben Koop, University of Victoria

Genetics Society of Canada: Young Investigator Award
Tom Hudson, McGill University

Howard Hughes Medical Institute International Scholar
Steve Scherer, Hospital for Sick Children
Peter St. George-Hyslop, University of Toronto

Huntington Society of Canada: Lifetime Achievement Award
Michael Hayden, University of British Columbia

Japan Society for the Promotion of Science
Visiting Scholar Award:
Frank Jirik, University of Calgary

Maria Vilma and Bianca Querci Foundation of Genoa (Italy) Querci Prize:
Charles Scriver, McGill University

Medicine/Science Journal editorial board
Francois Rousseau, Laval University

Merck Frosst
Award of Excellence in Research:
Tom Hudson, McGill University

MRC: Distinguished Scientist
Brenda Gallie, Hospital for Sick Children

National Academy of the Sciences USA
Foreign Associate
David MacLennan, University of Manitoba

Officer of the Order of Canada
David MacLennan, University of Manitoba

Ottawa Life Sciences Award of Merit
Michael Hayden, University of British Columbia

Premier's Research Excellence Award
Jayne Danska & Christopher Pearson, Hospital for Sick Children

Society for Neuroscience
Gass Traveling Scientist Lectureship
Peter St. George-Hyslop, University of Toronto

University of Manitoba
2001 Honorary Degree
David MacLennan, University of Manitoba

University of Manitoba
Meritas Tabaret Award
Peter St. George-Hyslop, University of Toronto

University of Toronto
Dales Award of Medical Research
Kathy Siminovitch, Mount Siani Hospital;
Peter St. George-Hyslop, University of Toronto

Neurology Research Award
Peter St. George-Hyslop, University of Toronto

World Innovation Foundation: Fellow
Lap-Chee Tsui, Hospital for Sick Children

York University
Honorary Degree
Lap-Chee Tsui, Hospital for Sick Children

AWARDS RECEIVED BY RESEARCH TEAM MEMBERS

Alberta Heritage Foundation for Medical Research
Graduate Studentship:
Gloria Hsi, Deepak Kamnasaran – University of Alberta
Post-Doctoral fellowship:
Lara Cullen, Alberta; R. Hsiung, University of British Columbia; Monica Narang, University of Calgary
Summer Studentship:
Karmon Helmle, Jai Shah – University of Alberta
American Society of Human Genetics
Cotterman Award
Ramsey Saleem, University of Alberta

Banting and Best Diabetes Center Studentship
E. Ivakine, Hospital for Sick Children

Brain Research Center: UBC Fellowship
R. Hsiung, University of British Columbia

Canadian Arthritis Newwork
Post-Doctoral Fellowship
Bill Newman, Mount Sinai Hospital

Canadian Association of Gastroenterologists
Post-Doctoral Fellowship
Mark Silverberg, Mount Sinai Hospital

CGDN Summer Studentships
Andrew Carson, Ashley Cox, Katherine Hagerman, Mariana Kekis, Ella Korets, Debbie Luk – Hospital for Sick Children; Sabine Koszegi, Ariana Murata – McGill; Christine Mancusco – Mount Sinai Hospital; Catherine Tong – UHN; Thea Chibuk, Ron Clarke, Karmon Helmie – University of Alberta; David He, Caroline Piggott – University of British Columbia; Anca Petrescu, Evan Roll – University of Calgary; Jay Hochman, Lisa Krupa, Dianna Martin- University of Manitoba.

Cystic Fibrosis Foundation Studentship
Ray Oh, Hospital for Sick Children

CIHR
Doctoral Award:
James Friedman, University of Alberta
Graduate Studentship:
Steve Moore, Deepak Kamnasaran – University of Alberta
PhD Studentship:
David DiCiommo, Toronto,
Amy Fortin, McGill
Research Studentship
R. Gladdy, Hospital for Sick Children
Post-Doctoral fellowship:
Anny Fortin, McGill University;
Jin Liqing, Hospital for Sick Children

Heart and Stroke Foundation of Ontario
John D. Schultz Scholarship:
Kursten Wolfe, J.P Robarts Institute
Martin Wills Scholarship:
Revecca Pollex, J.P Robarts Insitute

HSC Research Institute Studentship:
E. Ivakine, Hospital for Sick Children

Human Genetics Endowment Fund Research Award
Sherrie Kelly, University of Manitoba

McGill University
Max Bell Studentship:
Natalia Karp, McGill University

Medical Sciences Graduate Award
Ramsey Saleem, Alberta

Montreal Children's Hospital Research Institute Scholarship:
Jitka Stankova, Andrea Lawrance – McGill University

NSERC
Graduate Studentship:
Gloria Hsi, University of Alberta
Ontario Graduate Studentship:
Graeme Boocock, Hospital for Sich Children

Stella Degas Dunn Vision Science Fellowship:
David DiCiommo, University of Toronto

The Post Graduate Medicine's Edward Christie Steven's Fellowship:
David DiCiommo, University of Toronto

University of Alberta
75th Anniversary Graduate Award:
Kathy Kozlowski, University of Alberta
Walter H. Johns Graduate Fellowship:
James Friedman, University of Alberta

University of Toronto
Princess Margaret Foundation Cancer Prize
David DiCiommo, Toronto
Post-doctoral Fellowship
Bill Newman, Mount Sinai Hospital

Vision Science Research Program Studentship:
Stuart Lithwick, Mellone Marchong – University of Toronto

Training Report

The Canadian Genetic Diseases Network has created several non-traditional, interdisciplinary training programs that endeavour to build the expertise of senior researchers, to develop young scientists, and to strengthen the scientific infrastructure across Canada. These diverse training opportunities include courses, summer studentships, scholarships and the Annual Scientific Meeting.

Canadian Bioinformatics Workshops

CGDN initiated the Canadian Bioinformatics Workshops (CBW), in partnership with the Biotechnology Human Resource Council and Human Resources Development Canada, to address the critical shortage of researchers possessing essential skills in Bioinformatics. CBW is a national short-course program that is managed by CGDN, and taught by leading Bioinformatics experts. Since the original workshop in August 1999, more than 450 biologists and computer scientists, from both academia and industry, have participated in the workshop series. The workshops are attended by not only graduate students and post-doctoral fellows, but also Principal Investigators of the network.

The workshops continued in 2001 with tremendous success. Five workshops were offered across Canada from Vancouver to Fredericton: Bioinformatics (offered twice), Proteomics, Developing the Tools, and Genomics. Even after doubling its capacity, the introductory two-week Bioinformatics workshop remains fully subscribed.

The Burroughs Wellcome Fund generously supported the CBW by donating $45,000 for student bursaries. Twenty-eight BWF graduate studentships were awarded in 2001. A further 20 CGDN bursaries of $500 each were awarded to network participants. Both of these programmes will be expanded in 2002 to accommodate an expected increase in the number of graduate student participants.

In 2001, CGDN's partnership with Human Resources and Development Canada (HRDC) and the Biotechnology Human Resource Council (BHRC) continued to support a number of projects aimed at enabling bioinformatics capabilities in Canada.

White Paper on Bioinformatics Curriculum

Written after consultation with numerous Bioinformatics stakeholders, and with the support from the CBW Core Faculty members, the white paper provides a context for bioinformatics, establishes a detailed curriculum for bioinformatics education, and makes a comprehensive set of recommendations for delivering this curriculum at the undergraduate, graduate, and professional levels. This resource is available in both official languages at www.bioinformatics.ca.

CBW Mentors' Network

The success of the CBW series has stimulated considerable growth in the demand for bioinformatics training programmes within Canada. However, it was clear that CBW's ability to meet this demand would be constrained by the projected shortfall of teaching professionals in bioinformatics. To overcome this obstacle, the CGDN created an active mentoring network, consisting of experienced instructors and their junior colleagues. This mentoring network encourages CBW teaching assistants to develop new curriculum materials, and to refine their teaching skills under the mentorship of senior instructors. In December 2001, twenty mentors and junior instructors gathered in Vancouver for a two-day training workshop. Sessions included an exercise in instructional design, a presentation from each junior instructor, a lesson on testing and evaluating new lectures and labs, and a round-table discussion on student assessment methods. While still in an early stage, this project has experienced some early success. Six junior instructors designed and led their own lecture and/or lab at the Bioinformatics workshop held in February 2002.

Bioinformatics.ca

With its re-launch in October 2001, *www.bioinformatics.ca* has become the single most important portal to Bioinformatics activities in Canada, and the focus of communication within the Bioinformatics community. Nearly 5000 visitors a month access features such as job postings, searchable directories, course listings, annotated links to Bioinformatics software and tools, and online applications for the CBW workshops and bursary program.

Network Scholars

The scholars programme provides an opportunity for young scientists to collaborate with senior investigators. Although they are not supported by core research grants, Scholars have access to CGDN support through Strategic Funds, Core Facilities and the Annual Scientific Meeting. CGDN currently supports nine scholars from across Canada. They are Susan Andrew (University of Alberta), Dennis Bulman (University of Ottawa), Moira Glerum (University of Alberta), Celia Greenwood (McGill University), Elise Héon (University of Toronto), Christopher Pearson (Hospital for Sick Children), Bruce Rannala (University of Alberta), Daniel Sinnett (University of Montreal), and Rachel Wevrick (University of Alberta).

Summer Studentships

The CGDN Summer Studentship programme enables aspiring scientists to gain hands-on research experience in CGDN laboratories. In 2001, CGDN awarded twenty studentships for gifted undergraduate students. Past recipients of the award have gone on to graduate studies, medical school, MD/PhD programs, and careers in scientific research.

MD/PhD Scholarships program

In 2001, CGDN brokered a joint agreement with the Canadian Gene Cure Foundation (CGCF) and the Canadian Institutes of Health Research (CIHR) – Institute of Genetics to fund a new $1-million MD/PhD scholarships programme. The objective of the MD/PhD Scholarship programme is to increase the number of clinician scientists in the areas of genetics and genetic-related diseases. In total, ten scholarships will be awarded, each valued at $20,000 per year for six years. The first round of applications will be funded starting in September 2002.

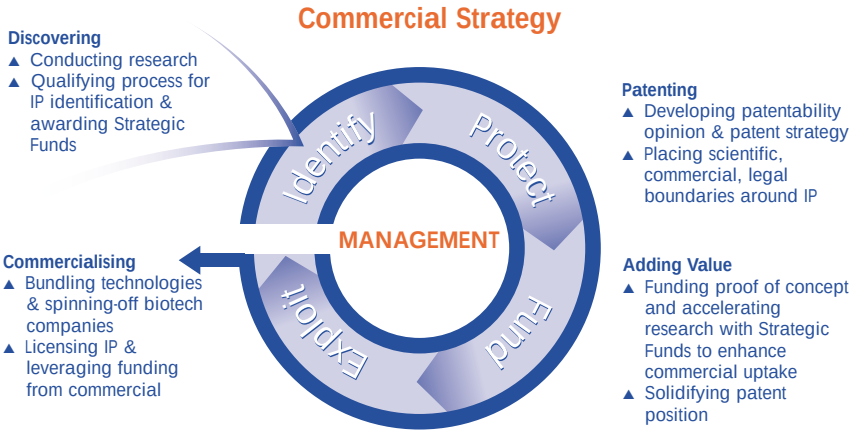
Annual Scientific Meeting

In April 2001, more than 70 graduate students were given the opportunity to meet with CGDN scientists, to learn about their research, and in turn, to display a poster detailing their own research. Five students were invited to give a formal presentation of their research and field questions from their peers and CGDN scientists.

Commercial Report

Financing, Technology Transfer, and Partnering Activities

An important mandate of CGDN is to catalyse Canada's commercial competitiveness by translating research discoveries into commercial products. To do this, CGDN has developed a commercial strategy to ensure that discoveries are captured at an early stage and protected by patents, and that investment with Strategic Funds accelerates the commercialisation of these discoveries.



Strategic investment funding:

As a result of this commercial strategy, CGDN invested two Strategic Grants in 2001-2002 with a total value of $146,560 (see Table 1).

This year, strategic fund investments and core research funding have resulted in the following:

- Eleven new discoveries patented
- Three patents licensed to industries

Industry days:

Two industry days were organised with Novartis Ophthalmics located in Basel, Switzerland. CGDN principal investigators and industry partners were invited to present their ocular research programmes to company representatives. Participants included:

- Xenon Genetics of Vancouver
- Aegera Pharmaceuticals of Montreal
- Dr. Michael Walter – University of Alberta
- Dr. Elise Héon – University of Toronto
- Dr. Robert Korneluk – University of Ottawa
- Dr. Rod McInnes – Mount Sinai Hospital
- Dr. Derek Van Der Kooy – University of Toronto

So far, these initiatives have resulted in two research agreements valued at $196,000 per year. Other agreements are currently under negotiation.

Spin-off companies:

In 2001-2002, a new spin-off company was created with management support from the network. The company is called Aspreva Pharmaceuticals Corp., an orphan drug company located in Victoria, British Columbia. The focus of the company is to make drug therapies available to patients with orphan diseases. An orphan disease is one that is rare, afflicting fewer than 1 in 2,000 people. Over 80 per cent of rare diseases are genetic in origin. Over 25 million people in North America are affected by a rare disease.

Table 1

Researcher(s)	Project Area	Strategic Funding
Dr. Thomas Grigliatti University of British Columbia	Generic Insulator Elements for Gene Therapy	$66,560
Dr. François Rousseau Laval University	Ultrahigh throughput SNP genotyping	$80,000
TOTAL		**$146,560**

Networking and Partnerships

National

CGDN was involved in a number of policy-related initiatives in 2001. The network, in collaboration with the Policy Research Institute, Genome Canada, Health Canada and Industry Canada, helped organise the "Symposium on Genomics and Public Policy". The event will take place before the BIO2002 meeting in Toronto. More than 100 people representing various stakeholder communities are expected to attend and participate in the meeting.

CGDN, in partnership with the Canadian Gene Cure Foundation and the CIHR Institute of Genetics, launched the first competition for the Charles Scriver & Jessie Boyd MD-PhD Scholarship. The outcome of the competition will be announced in September 2002.

International

CGDN negotiated a memorandum of understanding with the Karolinska Institute, in Stockholm, Sweden, to develop research collaborations in human genetics. In order to catalyse collaborations between the Karolinska Institute and CGDN principal investigators, the network is organising a Swedish-Canadian Symposium that will take place in Stockholm Sweden May 14 & 15, 2002. Other partners invited to take part in this initiative include: Genome Canada; CIHR Institute of Genetics; CIHR Institute of Neurosciences, Addiction and Mental Health; the Department of Foreign Affairs and International Trade; and the Canadian Embassy in Sweden. Over 60 persons are expected to participate in the Symposium, including 10 Canadians.

A memorandum of understanding between CGDN, CIHR Institute of Genetics and the Maxx Planck Institute in Germany was signed in the spring of 2002. The objective of this agreement is to establish research collaborations on Human Genetic Diseases between Canadian and German investigators.

Financial Report

Collins Barrow prepared audited statements for CGDN as part of NCE requirements beginning with fiscal year 2001. The Auditor's report, statement of financial position, statement of operations and notes to financial statements for 2002 are included below with comparative figures for the audited 2001statements. CGDN financial statements have been classified as non-consolidated statements by our auditors because they do not include financials for CGDN Ventures Inc., a wholly owned subsidiary. The Directors feel that consolidation of the for-profit subsidiary, provides very limited additional information.

Auditor's Report

To the Members of the Canadian Genetic Diseases Network

We have audited the statement of financial position of Canadian Genetic Diseases Network as at March 31, 2002 and the statements of operations, changes in net assets and cash flows for the year then ended. These financial statements are the responsibility of the company's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

As described in note 2(a), these financial statements are prepared on a non-consolidated basis.

In our opinion, except for the departure from Canadian generally accepted accounting principles described in the preceding paragraph, these financial statements present fairly, in all material respects, the financial position of the company as at March 31, 2002 and the results of its operations, changes in net assets and cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

COLLINS BARROW
CHARTERED ACCOUNTANTS
Vancouver, Canada
July 19, 2002

Statement of Financial Position
Year-end March 31, 2002

	2002 $	2001 $
ASSETS		
Current assets		
Cash and term deposits	1,519,838	1,364,716
Accounts receivable	755,150	398,709
Prepaid expenses	55,724	38,425
Advances to research institutions (note 3)	696,348	563,422
	3,027,060	2,365,272
Investment in subsidiary (note 4)	22,061	22,866
Capital assets (note 5)	124,947	25,212
	3,174,068	2,413,350
LIABILITIES		
Current liabilities		
Accounts payable and accrued liabilities	476,769	93,018
Deferred contributions (note 6)	1,464,092	1,289,831
	1,940,861	1,382,849
CAPITAL		
Invested in capital assets	124,947	25,212
Unrestricted net assets	1,108,260	1,005,289
	1,233,207	1,030,501
	3,174,068	2,413,350

Approved by the Directors

Ron Woznow
Director

Rob Abbott
Director

Statement of Operations
Year-end March 31, 2002

	2002 $	2001 $
Revenue		
Federal government grants (note 8(b))	4,605,682	4,252,326
Provincial government grants	150,000	90,000
Registration workshop fees – Bioinformatics	433,750	185,708
Industry / Foundations – Bioinformatics	60,105	113,287
Cost recoveries and other	338,335	264,223
	5,587,872	4,905,544
Expenditures		
Amortization	79,188	14,712
Bioinformatics – BHRC	262,006	—
– Workshops	423,315	302,874
Commercial research	789,538	306,122
Core research	3,309,705	3,229,774
Administration and general	470,609	425,075
Research training	50,000	136,626
	5,384,361	4,415,183
Excess of operating revenue over expenditures for the year	203,511	490,361
Equity in loss of subsidiary (note 4)	(805)	(77,135)
Net excess of revenue over expenditures for the year	202,706	413,226
Net assets, beginning of the year	1,030,501	617,275
Net assets, end of the year	1,233,207	1,030,501

Financial Report

Notes to Financial Statements

Year-ended March 31, 2002

1. Nature of activities

Canadian Genetic Diseases Network ("CGDN") is a not-for-profit corporation incorporated on March 3, 1998 under the Canada Corporations Act. The net assets and excess of revenue over expenditures of the corporation are not available for the personal benefit of any member.

The federal government of Canada has selected CGDN to receive core funding under its Networks of Centres of Excellence Program ("NCE") and has charged the Canadian Institutes of Health Research (formerly The Medical Research Council) with administrative responsibility for overseeing CGDN. The Canadian Institute of Health Research, CGDN, and the University of British Columbia ("UBC") have entered into a Funding Agreement dated April 1, 2002 which outlines the terms and conditions pursuant to which the CGDN is to receive core funding of $4,858,000 during fiscal 2003, $4,599,000 during fiscal 2004, and $4,052,000 during fiscal 2005.

Under the Funding Agreement, UBC agreed to provide suitable space and facilities. UBC receives an annual grant from the Province of British Columbia to offset the cost of services provided to the NCE at the University of British Columbia. In fiscal 2001 and 2002, CGDN administered the distribution of grant funds directly.

The New Mission Statement of the CGDN is:

To be the primary catalyst in advancing Canada's scientific and commercial competitiveness in genetic research, and the application of genetic discoveries to the prevention, diagnosis and treatment of human disease.

In support of its mission, CGDN will:

- Provide, and continually improve, a framework that supports a network of world-class genetic researchers.
- Develop appropriate intellectual property relationships with strategic partners to facilitate the translation of research into therapeutics and diagnostics.
- Identify appropriate business options to translate genetic research into therapeutics and diagnostics.
- Align with and support organisations that provide Canadians with access to educational opportunities and information on gene-based medicines.
- Provide appropriate training opportunities to continually enrich the network of researchers.
- Identify and develop international relationships that support the mission of CGDN.
- Improve network researchers' understanding of entrepreneurial opportunities arising from genetic research.

The Biotechnology Human Resource Council ("BHRC") has selected CGDN to assist in the development and management of the Building Bioinformatics Capabilities Project. BHRC and CGDN have entered into a contract dated December 29, 2000 which outlines the terms and conditions pursuant to which CGDN is to receive a total of $403,570 during the period from January 1, 2001 to March 31, 2002. For the period April 1, 2001 to March 31, 2004, BHRC will be entitled to receive 10% of any net profit derived by CGDN from the delivery or sale of any Bioinformatics training products and services. The network did not derive any net profit from the delivery or sale of Bioinformatics training products and services during the year.

2. Significant accounting policies

a) Subsidiary

The company's investment in CGDN Ventures Inc., a wholly owned subsidiary, is accounted for by the equity method. Generally accepted accounting principles normally require that financial statements prepared for issuance to members be prepared on a consolidated basis. However, in this case, the directors are of the view that the consolidation of the company's profit-oriented subsidiary provides limited additional information.

b) Capital assets

Capital assets are recorded at cost. Amortisation is provided on a straight-line basis over the assets' estimated useful lives, which for furniture and equipment is five years and for computer equipment is three years. Computer software is fully amortised in the year of acquisition.

c) Revenue recognition

CGDN follows the deferral method of accounting for contributions. Restricted contributions including federal grant revenue received under the NCE and BHRC programmes are recognised as revenue in the year in which the related expenditures are incurred. Unrestricted contributions are recognised as revenue when received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured. Endowment contributions are recognised as direct increases in net assets. The benefit of donated services is not recognised in the financial statements.

3. Advances to research institutions

The advances to research institutions represents the balance of unexpended NCE government grants on hand with the research institutions as at March 31, 2002. These funds are committed to various research projects by the research institutions and will be expended in fiscal 2003.

4. Investment in subsidiary

The investment in CGDN Ventures Inc. is comprised of:

	2002 $	2001 $
Shares, at cost (100% owned)	1	1
Note receivable, due on demand, interest at bank prime plus 2% per annum	100,000	100,000
Equity in loss	(77,940)	(77,135)
	22,061	22,866

The subsidiary's operating loss includes a write-down of its investment in Exella Ventures Inc. (33-1/3% owned), which was dissolved subsequent to March 31, 2002. As at March 31, 2002, the subsidiary's liabilities were nominal and the shareholder's equity was $22,061.

5. Capital assets

	2002			2001
	Cost $	Accumulated Amortization $	Net Book Value $	Net Book Value $
Computer software	7,557	7,557	—	—
Computer equipment	207,212	89,771	117,441	16,688
Furniture and equipment	12,791	5,285	7,506	8,524
	227,560	102,613	124,947	25,212

6. Deferred contributions

Deferred contributions represent unspent funding from NCE, and Burroughs Welcome Fund. The deferred contributions are committed to research and training projects in fiscal 2003.

	2002 $	2001 $
NCE – see note 8(b)	1,444,439	1,287,089
Burroughs Welcome Fund	19,653	2,742
	1,464,092	1,289,831

7. Economic dependence and related party transactions

As described in note 1, CGDN receives substantially all of its funding from NCE and BHRC.

Under the Funding Agreement, UBC agreed to provide suitable space and facilities. UBC receives an annual grant from the Province of British Columbia to offset the cost of services provided to the NCE at the University of British Columbia.

Substantially all of the core research and research training expenditures are paid to eligible participating research institutions, including UBC, who are members of the corporation in their capacity as researchers. Certain directors of CGDN also receive funding in their capacity as researchers.

CGDN acts as a nominee and agent on behalf of the Canadian Gene Cure Foundation ("Foundation"), a registered charitable organisation, in connection with certain investments. Substantially all of any share investments or other rights received are held for the endowment fund of the Foundation. The entities are considered related due to certain directors being common to both and their joint activities. During the year-end March 31, 2002, CGDN received fees of $18,337 from the Foundation (2001 – no fees). Included in accounts receivable at March 31, 2002 is approximately $6,400 due from the Foundation.

The transactions between CGDN and the Foundation are measured at the exchange amount, which is the amount of consideration established, and agreed to by each party.

8. Other information

a) Financial instruments

The carrying amounts of CGDN's financial instruments approximate fair value due to their short maturities. CGDN is not exposed to credit or interest rate risks.

b) Federal government grant revenue

	2002 $	2001 $
NCE funds	4,500,000	4,500,000
BHRC funds	263,032	222,779
	4,763,032	4,722,779
Add: Deferred contributions, beginning of the year, recognised as revenue in the year NCE	1,287,089	816,636
Less: Deferred contributions, end of the year NCE	(1,444,439)	(1,287,089)
	4,605,682	4,252,326

c) Comparative figures

The comparative figures have been reclassified, where applicable, to conform with the presentation used in the current year.

Board and Members

Board of Directors

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Vegreville, Alberta

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Principal
Abbott Strategies, Vancouver, B.C.

Mr. David Arkowitz
Controller, Merck Research Laboratories
Merck & Company, Rahway, N.J.

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Pfizer Canada Inc., Kirkland, Quebec

Mr. Noel Hall
President and Co-founder
Aspreva Pharmaceuticals Corp., Victoria, B.C.

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Professor of Medical Genetics
University of British Columbia, Vancouver, B.C.

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Hospital for Sick Children, Toronto, Ontario

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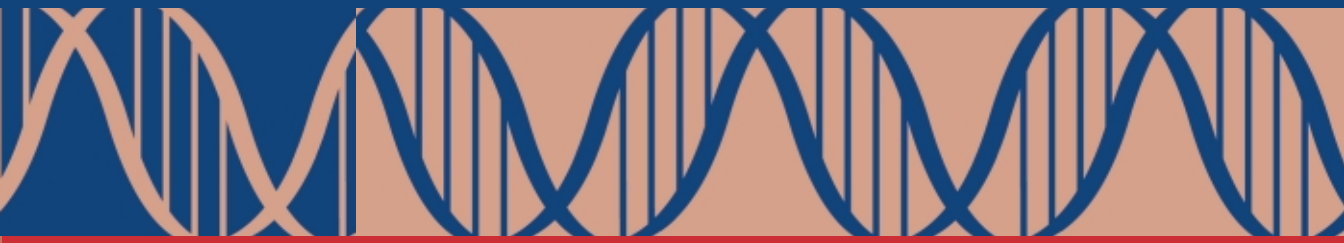
Dr. Chrystal Palaty
Manager, Scientific Affairs & Training

Dr. Louise Desjardins
Manager, Business Development

Ms. Janie Patrick
Manager, Finance

Mr. Dean Sas
Manager, Development and Communications



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CANADIAN GENETIC DISEASES NETWORK
RÉSEAU CANADIEN DE MALADIES GÉNÉTIQUES

Canadian Bioinformatics Workshops

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