



## The 2<sup>nd</sup> National Bioscience Educators' Conference

The Canadian Biotechnology Education Resource Centre (CBERC) and the School of Biological Sciences and Applied Chemistry (SBSAC) of Seneca College at York University, present the 2<sup>nd</sup> National Bioscience Educators' Conference. This conference is generously sponsored by the Ontario Ministry of Research and Innovation, Monsanto, GlaxoSmithKline, AstraZeneca, Ontario Genomics Institute, Borden Ladner Gervais LLP, Seneca College, BioBusiness Magazine, BIOTECanada and UCB Pharma.



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

**Thursday, February 28, 2008**

8:30am-9:00am	<b>Registration (S1209)</b>		
<b>Keynote</b> 9:00am – 10:00am	Dr. Gord Surgeoner, (President, Ontario Agri-Food Technologies) "Agriculture Beyond Food and Feed" <b>Room S1208</b>		
<b>Session 1</b> 10:10am-11:00am	Dr. Kirsty Duncan (U of T) <b>Room S1208</b>  "From Hunting the 1918 Flu to Inspiring Change"	Dr. Richard Ellen (U of T) <b>Room S1201</b>  "Cellular microbiology: bacteria halt cell motility by targeting the cytoskeleton"	<b>Workshop</b> (25 person limit) <b>Room S3108</b>  "Recombinant DNA"
<b>Session 2</b> 11:10am-noon	Dr. Shane Green (Ontario Genomics Institute) <b>Room S1208</b>  "The Science and Social Impact of Genomics Research"	Dr. Imogen Coe (Biology Department, York U) <b>Room S1201</b>  "Forum on Challenges of Teaching Life Sciences in the 21st Century"	<b>Workshop</b> (Seneca Faculty) <b>Room S3014</b>  "Digital Imaging"
Noon-1:00pm	<b>Lunch S1209</b>		
<b>Session 3</b> 1:00pm – 1:50pm	Dr. Brian Wilson (Ontario Cancer Institute) <b>Room S1208</b>  "Biophotonics: Bringing Light to Life"	Colette Rivet (BioTalent Canada) <b>Room S1200</b>  "Careers in the Bio-Economy"	Kathy Frame, Lead Education Consultant, Papillion Education Services LLC <b>Room S1201</b>  "Yesterday's Pharmacy....Today's Hope"
	<b>REFRESHMENT</b>	<b>BREAK (S1209)</b>	
<b>Session 4</b> 2:00pm – 2:50pm	Dr. Ulli Krull (UTM) <b>Room S1208</b>  "The intersection of biotechnology and nanotechnology – harnessing biological processes at the smallest scale"?	Dr. Marianne Fedunikiw (Ontario Genomics Institute) <b>Room S1201</b>  "Life Science Teaching Excellence" Panel Discussion	<b>Workshop</b> (25 person limit) <b>Room S3073</b>  "Microbiology"

## Friday, February 29, 2008

8:50 Welcoming remarks, Room S1208

8:30-9:00am	<b>Registration</b>		
<b>Keynote</b> 9:00am – 10:00am	John Wilms, IBM Lifesciences <b>Room S1208</b>		
<b>Session 1</b> 10:10am-11:00am	Dr. Bob Hanner (U of G) <b>Room S1208</b> "Bar-coding Biodiversity"	Dr. Kevin Fehr (GlaxoSmithKline) <b>Room S1201</b> "The right medicine for the right patient: how we're using genetics to improve human health."	<b>Workshop</b> (25 person limit) (Seneca Faculty) <b>Room S3108</b> "Recombinant DNA"
<b>Session 2</b> 11:10am-noon	Dr. Gideon Wolfaardt (Ryerson) <b>Room S1208</b>  "Microbial Diversity and Bioenergy"	Dr. Imogen Coe (Biology Department, York U) <b>Room S1201</b>  "Forum on Challenges of Teaching Life Sciences in the 21st Century"	Joyce McCallum, Morden Collegiate, Manitoba <b>Room S1201</b>  "Dreaded Red": A Classroom Simulation (Program developed by National Microbiology Laboratory, Winnipeg)
Noon-1:00pm	<b>Lunch S1209</b>		
<b>Session 3</b> 1:00pm – 1:50pm	Dr. Doug Holdway,(U of OIT) <b>Room S1208</b> "Water Pollution and Aquatic Ecosystems"	Maureen Callan (Ministry of Education) <b>Room S1201</b> "Changes to the Ontario Curriculum Science 9-12"	<b>Workshop</b> (25 person limit) (Seneca Faculty) <b>Room S3073</b> "Microbiology"
	<b>REFRESHMENT</b>	<b>BREAK (S1209)</b>	
<b>Session 4</b> 2:00pm – 2:50pm.	Dr. Logan Donaldson, (York) <b>Room S1208</b>  "When a picture is worth a thousand words - how macromolecular structures advance our understanding of biology"	Ms Diane DeMelo Government of Ontario (Ministry of Research and Innovation) <b>Room S1200</b>  "The Teachers' Science and Technology Outreach Program (TSTOP)" Dr. Doug Holdway and Richard Hamel	Dr. Jeremy N. Friedberg, (Spongelab Interactive Inc.) <b>Room S1201</b>  "Using games to teach biology: Immersive learning and the genomics approach."

## Session Details

### Thursday, February 28, 2008

Welcoming remarks (8:50-9:00 a.m.) Room S1208

**Dr. Rick Miner, President, Seneca College**  
**Mr. Jeff Graham, President and Chair, Canadian Biotechnology Education Resource Centre**

Plenary Session (9:00 – 10:00 a.m.) Room S1208

**Agriculture Beyond Food and Feed**

An outline of the role that agriculture will play in finding solutions to reduce our dependency on fossil fuels. It will look at both the science and business factors and the role that biotechnology in developing new products to make this possible.

**Presenter: Dr. Gord Surgeoner, President, Ontario Agri-Food Technologies**

281A (10:10 – 11:00 p.m.) Room S1208

**From Hunting the 1918 Flu to Inspiring Change**

Dr. Duncan led the expedition to discover the causal agent of the 1918 Spanish influenza. Her book, 'Hunting the 1918 Flu: One Scientist's Search for a Killer Virus', details the ten-year history of the search. Her presentation will cover highlights of the expedition and include stunning images of the arctic

**Presenter: Dr. Kirsty Duncan, Adjunct Professor, University of Toronto and Royal Roads University**

281B (10:10 – 11:00 p.m.) Room S1201

**Cellular microbiology: bacteria halt cell motility by targeting the cytoskeleton**

Indigenous and parasitic bacteria have evolved to survive in their host by communicating with and, in many instances, exploiting host cell signaling pathways that regulate key cellular functions. Bacterial toxigenic impact on the cytoskeleton and resultant inhibition of cellular motility is an example with significance for affecting the outcome of infection and immunity. The presentation will focus on how biotechnological approaches such as fluorescence imaging, biochemistry, and cell transfection are applied to solve research problems in cellular microbiology. Examples will include a bacterial surface protein that inhibits chemotaxis of innate immune cells by disorienting cytoskeletal regulation and the discovery of an amino acid motif in the protein that targets a cytoskeletal signaling pathway to impede cell migration.

**Presenter: Dr. Richard Ellen, Professor, Faculty of Dentistry, University of Toronto**

281C (10:10 – 11:00 p.m.) Room S3108

**Recombinant DNA Workshop** (25 person limit)

**Facilitators: Dr. Mike Gadsden and Dr. Alison Symington, Seneca Faculty**

282A (11:10 a.m. – noon) Room S1208

**The Science and Social Impact of Genomics Research**

The Human Genome Project was just the beginning. Genomics and related sciences are providing remarkable insights into the world around us with unprecedented speed. This lecture will introduce you to some of the latest in genomics research, including the exciting work being done right here in Ontario, and the ethical and societal implications of new discoveries in this exciting area.

**Presenter: Dr. Shane K. Green, Ontario Genomics Institute**

282B (11:10 a.m. – noon) Room S1201

**Forum on Challenges of Teaching Life Sciences in the 21st Century**

**Presenters: Dr. Imogen Coe and Faculty of the Biology Department, York University**

**282C (11:10 – 12:00 p.m.) Room S3014**

**Digital Imaging Workshop** (25 person limit)

**Facilitators: Dr. Dan Phillips, Seneca Faculty**

**283A (1:00 – 1:50 p.m.) Room S1208**

**Biophotonics: Bringing Light to Life**

Light has special properties that make it a uniquely useful tool in the life sciences, for probing and manipulating structures and processes at the molecular level. Major thrusts are in imaging (from studying the dynamics of single biomolecules to following gene expression in living animals to diagnosing early disease in patients), intervention (from manipulating sub-cellular organelles to using ultrafast pulsed lasers in treating human disease; and in analytics (from revealing patterns of gene expression to tracking stem cells to non-invasive measures of brain activity). These developments are enabled by an explosive expansion of photonic (optical) technologies from fields as diverse as telecommunications and remote sensing. The further convergence of biophotonics with nanotechnology has recently added a new dimension, exploiting the novel properties of that emerge when materials are at the nanoparticle scale.

**Presenter: Dr. Brian Wilson, Ontario Cancer Institute**

**283B (1:00 – 1:50 p.m.) Room S1200**

**Careers in the Bioeconomy**

**Presenter: Ms. Colette Rivet, BioTalent Canada**

**283C (1:00 – 1:50 p.m.) Room S1201**

**Yesterday's Pharmacy - Today's Hope**

Participants will explore the history of the use of plants and how today's drug industry continues to build upon indigenous knowledge. A simulated microarray will enable participants to identify genes with the potential for curing diseases.

**Presenter: Kathy Frame, (Papillion Education Services LLC)**

**284A (2:00 – 2:50 p.m.) Room S1208**

**The intersection of biotechnology and nanotechnology – harnessing biological processes at the smallest scale**

The contrast between technology and science will be explored from the perspective of the move from a fundamental understanding of the behaviour of matter to applications which rely on such behaviour. The opportunity to use biological processes at the molecular scale to self-assemble electronics, produce diagnostic sensors that can operate within living cells, and produce motility of particles as nano-machines, represent some of the examples that highlight the new technology that is emerging from fundamental investigations of the behaviour of materials at the nano-scale.

**Presenter: Dr. Ulli Krull (University of Toronto at Mississauga)**

**284B (2:00 – 2:50 p.m.) Room S1201**

**Life Science Teaching Excellence" Panel Discussion**

**Panelists: Mr. Gabriel Ayyavoo, Ms. Kathy Frame, Dr. Danielle Gauci, Ms. Cate McCready**

**Moderator: Dr. Marianne Fedunski (Ontario Genomics Institute)**

**284C (2:00 – 2:50 p.m.) Room S3073**

**Microbiology Workshop** (25 person limit)

In this hands-on workshop, participants will conduct two exercises that explore the beneficial and harmful relationships between bacteria and humans. "The Microbiology of Yogurt" demonstrates how to isolate,

stain and observe the active bacterial cultures in yogurt. In “A Microbial Mystery”, participants will identify three unknown microorganisms using a series of biochemical tests. Facilitators will discuss strategies for adapting these exercises to the high school classroom.

**Facilitators: Dr. Marion Kist and Dr. Linda Facchini (Seneca College)**

## **Friday, February 29, 2008**

### **Plenary Session (9:00 – 10:00 a.m.) Room S1208**

**Presenter: Mr. John Wilms, IBM Lifesciences**

### **291A (10:10 – 11:00 p.m.) Room S1208**

#### **Bar-coding Biodiversity**

A grand challenge for biology is to produce an inventory of all species on Earth and after 250 years of trying, we still lack even a reasonably complete checklist. Meanwhile, the ability to identify most species of known organisms requires special expertise and even then is usually only applicable to intact adult specimens. Modern biotechnology is being harnessed to aid this endeavor and will extend species recognition to forensic applications.

**Presenter: Dr. Robert Hanner, University of Guelph**

### **291B (10:10 – 11:00 a.m.) Room S1201**

#### **The right medicine for the right patient: how we're using genetics to improve human health**

This presentation will update you on some of the progress being made toward the “holy grail” of personalized medicine or “pharmacogenomics”.

**Presenter: Dr. Kevin Fehr (GlaxoSmithKline)**

### **291C (10:10 – 11:00 p.m.) Room S3108**

#### **Recombinant DNA Workshop** (25 person limit)

**Facilitators: Seneca Faculty**

### **292A (11:10 – noon) Room S1208**

#### **Microbial Diversity and Bioenergy**

Most microbial processes that occur in natural, engineered and heterogeneous communities of surface-associated cells, commonly referred to as biofilms, perform clinical environments. Despite this dominance, microbes have traditionally been studied in pure culture as free floating cells. This oversight most probably contributed to numerous failures to optimize microbial performance in bioprocesses and other biotechnological applications, or to control unwanted microbial growth in food spoilage and the health / clinical areas. We have been involved in the study of biofilm communities and were able to demonstrate the extensive molecular, structural and metabolic variability of microbial communities, but also observed the challenge to replicate these complex processes in the laboratory or to link biofilm community form with function. In contrast to a reasonable degree of predictability in biofilm form, demonstrated by pure cultures and mixed-species to variation in flow and nutrient conditions and cultivated in the laboratory, microbial communities in bioreactors and other complex systems show diverse successional patterns in molecular profiles and biofilm structure. Such plasticity implies that microbial activity cannot be sufficiently described by a single conceptual model of the bacterial cell. Recent research in the area of biomass-to-fuel conversion will be used as an example to demonstrate.

**Presenter: Dr. Gideon Wolfaardt, (Ryerson University)**

### **292B (11:10 a.m. – noon) Room S1200**

**Forum on Challenges of Teaching Life Sciences in the 21st Century**

**Presenters: Dr. Imogen Coe and Faculty of the Biology Department, York University**

**292C (11:10 a.m. – noon) Room S1201**

**“Dreaded Red”: A Classroom Simulation**

Dreaded Red is a simulation, based on the spread of SARS. It involves a whole classroom with groups of students taking on the roles of primary health care, Health Canada, World Health Organization, the media and the indexing patient. The activity can be done in one class period. The program was developed by Dr. Steven Jones, Director, Special Pathogens, National Microbiology Laboratory, Winnipeg.

**Presenter: Joyce McCallum, (Morden Collegiate, Morden, Manitoba)**

**293A (1:00 – 1:50 p.m.) Room S1208**

**Water Pollution and Aquatic Ecosystems**

This presentation will briefly define what pollution is, and what are specific pollutants compared to toxicants. The major types, sources, and effects of water pollutants will be outlined followed by a brief discussion of how we can reduce and help prevent water pollution in our day-to-day living. A description of the new UOIT aquatic toxicology laboratory will then be provided along with a brief summary of the UOIT research program in aquatic toxicology.

**Presenter: Dr. Doug A. Holdway, (University of Ontario Institute of Technology)**

**293B (1:00 – 1:50 p.m.) Room S1201**

**Changes to the Ontario Science Curriculum (Grades 9-12)**

This session will focus on the changes to the Ontario curriculum that is to be released in September 2008. The session will also discuss implementation planning and timelines.

**Presenter: Maureen Callan, Ontario Ministry of Education**

**293C (1:00 – 1:50 p.m.) Room S3073**

**Microbiology Workshop** (25 person limit)

In this hands-on workshop, participants will conduct two exercises that explore the beneficial and harmful relationships between bacteria and humans. “The Microbiology of Yogurt” demonstrates how to isolate, stain and observe the active bacterial cultures in yogurt. In “A Microbial Mystery”, participants will identify three unknown micro-organisms using a series of biochemical tests. Facilitators will discuss strategies for adapting these exercises to the high school classroom.

**Facilitators: Dr. Marion Kist and Dr. Linda Facchini (Seneca College)**

**294A (2:00 – 2:50 p.m.) Room S1208**

**When a picture is worth a thousand words - how macromolecular structures advance our understanding of biology**

Biomolecules are intrinsically very modular. This session will provide strategies for students to learn and use this concept to understand simple biomolecules. Examples and tools will be provided for students to help them understand how biomolecular structure and function relates to life.

**Presenter: Dr. Logan Donaldson (York University)**

**294B (2:00 – 2:50 p.m.) Room S1200**

**“The Teachers' Science and Technology Outreach Program (TSTOP)”**

This session will inform about the TSTOP professional development opportunity for teachers.

**Panelists: TSTOP mentor Dr. Doug Holdway and teacher Mr. Richard Hamel**

**Moderator: Ms Diane DeMelo, Ontario Ministry of Research and Innovation**

**294C (2:00 – 2:50 p.m.) Room S1201**

**Using games to teach biology: Immersive learning and the genomics approach**

From chess to Age of Empires... all games offer learning... its value, however, is a matter of opinion! The industry of serious games has been growing steadily since the 1970's. Beginning with military funded flight simulators, games that teach, or that have been adapted for learning, are being used in professional training, advertising, public awareness, and even in classroom biology. This talk will deal with the nature of games that teach, why they are effective, what are their drawbacks and the potential for teaching biology in the genomics era.

**Presenter: Dr. Jeremy N. Friedberg, (Spongelab Interactive Inc.)**

## **SPEAKER/PANELIST BIOGRAPHIES**

### **Mr. Gabriel Ayyavoo, Science Department Head, Notre Dame High School, Toronto**

Gabriel Ayyavoo has more than 20 years of teaching experience, with the Toronto Catholic District School Board. In 1996, he began an after school Biotechnology Club with second hand equipment, giving students an opportunity to do biotechnology. By raising public and private funds, he upgraded the biology lab, bringing in new computers and sophisticated equipment. Mr. Ayyavoo also introduced the program, "A Geneticist for a week", designed to give students biotech experience through participating in a biotech job interview, doing biotech and talking about biotech ethics. Mr. Ayyavoo received a BIOTEC Canada - Biogen Idec Teaching Excellence Award in 2006.

### **Ms. Maureen Callan, Education Officer, Ontario Ministry of Education**

### **Dr. Imogen Coe, Associate Professor of Biology and Department Chair Department of Biology, Faculty of Science & Engineering York University**

### **Ms Diane DeMelo, Senior Policy Advisor, Ministry of Research and Innovation, Government of Ontario**

### **Dr. Logan Donaldson, Department of Biology, Faculty of Science & Engineering, York University**

Logan Donaldson joined York University in 2000 after postdoctoral fellowships at the US National Institutes of Health (Bethesda, MD) and the Hospital for Sick Children (Toronto, ON). He is currently an Associate Professor in the Department of Biology with an broad NSERC-CFI-CIHR funded research program that examines structural basis of antibiotic resistance, virus assembly, and cell signaling. For five years, he has been an Instructor and Course Director of BIOL 1010 Introductory Biology, the gateway course in life science for the Department. Dr. Donaldson is a recipient of an Ontario Premier's Research Excellence Award and a CIHR New Investigator salary award.

### **Dr. Kirsty Duncan, Adjunct Professor, University of Toronto, Adjunct Professor, Royal Roads University**

Dr. Kirsty Duncan is the former Research Director, AIC Institute of Corporate Citizenship, Rotman School of Management, and an Adjunct Professor at Royal Roads University and at the University of Toronto [and formerly an Associate Professor at the University of Windsor (1993-December 31st, 2000)]. Dr. Duncan led the expedition to discover the causal agent of the 1918 Spanish influenza. Her book, 'Hunting the 1918 Flu: One Scientist's Search for a Killer Virus', details the ten-year history of the search, and was published by the University of Toronto Press in 2003. The book was short-listed for the 2004 Canadian Science Writers' Association awards.

Dr. Duncan also teaches corporate social responsibility at the Rotman School of Management, and global environmental processes at Royal Roads University. She has just completed writing a second academic book, 'Environment and Health: Corporate Contributions to Our Common Future'. She has completed work, regarding climate change and human health for North America, for the Intergovernmental Panel on Climate Change, a joint venture of the United Nations Environmental Programme and the World Meteorological Organization.

In 2001 and 2000, Dr. Duncan was nominated for the Order of Ontario. She was awarded the Arnold G. Wedum Memorial Lectureship for 1999 at the 42nd Biological Safety Conference for 'outstanding contributions to biological safety'. Dr. Duncan was nominated for Canada's Top 40 Under 40 in 1997, 1998, 1999 and 2001.

**Dr. Richard Ellen, Professor, Faculty of Dentistry and Faculty of Medicine, University of Toronto**

Richard P. Ellen is Professor, Faculty of Dentistry, University of Toronto, cross-appointed to the Graduate Department of Laboratory Medicine and Pathobiology, Faculty of Medicine. He is a member of the Canadian Institutes of Health Research (CIHR) Group in Matrix Dynamics [www.cihrmatrix.ca] and a former member of the CIHR Dental Sciences Committee. He is Director of a transdisciplinary CIHR strategic training program, Cell Signaling in Mucosal Inflammation & Pain [www.cellsignals.ca]. He is a past president of the Canadian Association for Dental Research. He is now the Regional Board Member for North America of the International Association for Dental Research [2004-2008]. He was recently elected by his peers to serve as the co-chair [2008] and then chair [2010] of the Gordon Research Conference on the Biology of Spirochetes. Dr. Ellen is on the editorial board of the Journal of Dental Research and the Journal of Periodontology.

Dr. Ellen is a recognized authority on oral microbial ecology, the biology of dental plaque and other biofilms, the biology of spirochetes, and the pathogenesis of periodontal diseases. He has published many dozens of peer-reviewed research articles and has co-edited, with H.K. Kuramitsu, the most advanced monograph on the molecular basis of oral bacterial ecology.

**Dr. Linda Facchini (School of Biological Sciences and Applied Chemistry, Seneca College)**

Dr. Linda Facchini completed her Bachelor of Science degree in Microbiology and her Ph.D. in Molecular and Medical Genetics at the University of Toronto. Her graduate work involved the study of the regulation of cancer genes. She worked as a post-doctoral fellow at the Hospital for Sick Children prior to arriving at Seneca College. She is currently teaching microbiology, cell culture, and immunology.

**Kathy Frame, Lead Education Consultant Papillion Education Services LLC**

Kathy Frame is the Lead Education Consultant for Papillion Education Services LLC established in 2007. Clients include the National Academy of Sciences, National Association of Biology Teachers, Harrisburg University, and Muncy School District. Prior to that, she was Vice President for Educational Programs at the Biotechnology Institute located in Arlington, VA where she led the Institute's major efforts to educate the public, especially youth, about the promise and challenge of biotechnology

Ms. Frame was the Director of Education for the National Association of Biology Teachers (NABT) for more than nine years. While there, she wrote and administered several programs that promoted biotechnology training for teachers, partnerships between industry and educators, and science education for students. She also edited Shoestring Biotechnology, a manual that offers teachers thoughtful, comprehensive classroom activities that promote hands-on student inquiry biotechnology activities at a low cost. She received her Master of Science in Biology from Johns Hopkins University and has 15 years of classroom experience teaching biology, chemistry, and other related sciences at the high school level.

**Dr. Jeremy N. Friedberg, Partner, Spongelab Interactive Inc.**

**Dr. Mike Gadsden, (School of Biological Sciences and Applied Chemistry, Seneca College)**

Dr. Gadsden obtained his B.Sc. and PhD in biology (molecular genetics) from York University and his B.Ed. from the University of Toronto. He has worked as a research assistant, teaching assistant, part time professor at University of Toronto, and as a consultant. Dr. Gadsden's most recent research interests include the characterization of proteins, and their genes, that are involved in DNA metabolism. Using biochemical and recombinant DNA techniques, this research is directed toward identifying potential chemotherapeutic sites. Mike has been with Seneca since 1992 and is involved in teaching biology labs and lectures.

**Dr. Danielle Gauci, Northern Secondary School, Toronto**

Danielle was the recipient of the inaugural Ontario Genomics Institute (OGI) Genomics Teaching Prize in 2007 and also one of the three BIOTEC Canada - Biogen Idec Teaching Excellence Awards in the same year. Throughout her seven years of teaching, Danielle has gone above and beyond to bring biotech into Northern's classrooms, and showing students how biotechnology can be discovered in the home through

safe and fun experiments. Danielle organizes and delivers three biotech courses in the school while maintaining the fully equipped biotechnology lab, and encourages her students to participate in a number of extra curricular activities such as essay contests and science fairs. She is also responsible for overseeing the school's participants in the Sanofi-Aventis BioTalent Challenge, working with students on her own time to facilitate the success of Northern's students in the competitions. Danielle also encourages her colleagues to learn more about biotech through workshops, working with her colleagues to integrate biotechnology into science curriculum at the school.

**Dr. Shane K. Green, Director of Outreach, Ontario Genomics Institute**

Dr. Green is the Director of Outreach at the Ontario Genomics Institute (OGI) in Toronto, where he is responsible for overseeing OGI's outreach activities relating to genomics and related sciences and their social impacts. These activities include developing and implementing public outreach and education initiatives and providing "bench-side ethics" support to researchers receiving funding through OGI.

Dr. Green holds an honours B.Sc. in Molecular Biology and Genetics from the University of Guelph and a Ph.D. in Medical Biophysics (Cell and Molecular Biology Division) from the University of Toronto. He has studied and taught bioethics and research ethics through the American Medical Association in Chicago, Illinois, and the University of Toronto Joint Centre for Bioethics, and has served on the Research Ethics Boards of the Centre for Addiction and Mental Health and Sunnybrook Health Sciences Centre, in Toronto.

**Dr. Robert Hanner, Associate Director, Canadian Barcode of Life Network, Biodiversity Institute of Ontario & Department of Integrative Biology, University of Guelph**

Dr. Hanner is Chair of the Database Working Group for the international Consortium for the Barcode of Life (CBOL) initiative. He also serves as Coordinator for the Fish Barcode of Life campaign (FISH-BOL), a project of global scale that aims to assemble DNA barcodes for all fishes. Dr. Hanner is a Past President of the International Society for Biological and Environmental Repositories (ISBER). Prior to his arrival in Guelph (August of 2005), he served as the Scientific Program Director for the Coriell Cell Repositories (at the Coriell Institute of Medical Research) and prior to that, he was a Curatorial Associate at the American Museum of Natural History where he spearheaded the establishment of the Ambrose Monell Collection for Molecular and Microbial Research.

**Dr. Douglas A. Holdway, Canada Research Chair in Aquatic Toxicology, Professor of Ecotoxicology, Faculty of Science, University of Ontario Institute of Technology**

Dr. Holdway was born in Montreal and raised mostly in Ontario. He obtained his BSc (Hons), MSc and PhD from the University of Guelph and worked for 17 years as a government scientist and then academic in Australia before returning to Canada in 2002. Dr Holdway is Professor of Ecotoxicology and was appointed in June, 2004 as a Tier 1 Canada Research Chair in Aquatic Toxicology at UOIT. He has more than 279 publications, exhibitions and professional works including 112 refereed papers and reports and 136 conference abstracts and has successfully supervised 3 MSc and 14 PhD students to completion. His expertise is in aquatic toxicology and marine biology with particular interest in fish reproduction, endocrine disruptors and biomarkers of xenobiotic exposure and effects. Professor Holdway is on the Editorial Boards of the journals: Science of the Total Environment, Marine Pollution Bulletin, Chemosphere and the Australasian Journal of Ecotoxicology. Funding agencies have included the Canada Research Chairs program, Natural Sciences and Engineering Research Council of Canada (NSERC), the Canada Foundation for Innovation (CFI), and the Australian Research Council (ARC) amongst others. Professor Holdway's consultancy services include providing expert advice on the toxicity and environmental hazards of inorganic and organic contaminants and he has done numerous consultancies in Canada, Australia and overseas.

**Dr. Marion Kist, Professor, School of Biological Sciences and Applied Chemistry, Seneca College**

Dr. Kist obtained her B.Sc. from the University of Toronto, her Ph.D. in Microbiology from the University of Western Ontario, and her B.Ed. from the University of Toronto. She has research and teaching experience in microbiology, biology and biochemistry from the University of Western Ontario; University of Toronto and the Toronto Hospital. Marion teaches first year biology, introductory microbiology and advanced microbiology subjects. She is a member of the Canadian Society of Microbiologists, the American Society for Microbiology and the Science Teacher's Association of Ontario.

**Dr. Ulli Krull, Professor, Department of Chemistry, V-P Research, University of Toronto at Mississauga**

Ulrich Krull completed his BSc, MSc and PhD (1983) degrees at the University of Toronto. He is appointed as a Professor of Analytical Chemistry at the University of Toronto, and holds the endowed AstraZeneca Chair in Biotechnology. He presently handles the portfolios of Vice-Principal:Research and Vice-Dean:Graduate Affairs at the University of Toronto Mississauga (UofTM).

His research interests are in the areas of biosensor and diagnostic technologies, and applications to biotechnology, forensic, clinical and environmental chemistry. His research work is exploring the use of nanoscale materials and microfluidics chip technologies to build devices for detection of DNA and RNA targets. Some of these device technologies are presently being commercialized.

Krull is recognized as one of the leading analytical chemists in Canada. He has over 200 refereed publications and more than a dozen patents. He is a Fellow of the Chemical Institute of Canada. He has received both the McBryde Medal, and the Maxxam Award of the Canadian Society for Chemistry (the top awards for analytical chemistry research in Canada). He has been a recipient of the University of Toronto Faculty Excellence Award. Krull has served as the Associate Dean-Sciences at UofTM, Vice-President of the Royal Canadian Institute, and presently is an editor of *Analytica Chimica Acta*, a major international journal for analytical chemistry. He serves on a number of Scientific Advisory Boards for industry. Krull serves as the Chair of the consortium of industry, government and institutions that form the Western Greater Toronto Area Convergence Centre (<http://www.wgtacc.com>), a Regional Innovation Network funded in partnership with the Ontario Ministry of Research and Innovation.

**Joyce McCallum, Morden Collegiate, Morden, Manitoba**

Joyce McCallum is a biology and mathematics teacher from Morden Collegiate in southeast Manitoba. She is an outstanding educator who uses many hands on activities in her biology teaching. She uses the Dreaded Red epidemiology simulation in her classroom as well as demonstrating its use to educators in Manitoba.

**Mr. Dan Phillips, Chair, School of Biological Sciences and Applied Chemistry, Seneca College**

Undergraduate studies were completed at the University of Toronto, with an emphasis in zoology and developmental biology. This was followed by graduate work at York University, in Toronto, specializing in insect biochemistry and development.

The first years at Seneca College have been concerned with the development of curriculum and teaching strategies, for the delivery of college preparatory biology, chemistry, physics and mathematics to the adult learner.

Academic interests lie in the area of biology curriculum and teaching methodologies, concerning the transition of first year college students from their previous academic setting to the college environment.

Mr. Phillips is the chair of the School of Biological Sciences and Applied Chemistry.

**Ms. Colette Rivet, Executive Director, BioTalent Canada**

Colette Rivet is the Executive Director of BioTalent Canada. She is responsible for the overall management, operations and strategic development of the organization, including financial and managerial duties, external relationships and administrative duties. Colette has several years of senior management experience in such positions as Director of Strategic Operations for the Canadian Centre on Substance Abuse, Strategic Resource Alignment Associate of the Canadian Institutes of Health Research, Manager of The McLaughlin Centre for Evaluation at the Royal College of Physicians & Surgeons of Canada, Professional Liaison at Cangene Corporation, Director of Scientific Resources at the Canadian Blood Agency and Manager of Component Quality, Laboratory Services at the Canadian Red Cross Society.

Colette holds an MBA from the University of Ottawa and National Certificate in Voluntary and Non-Profit Sector Management. She is also a Certified Health Executive, a Clinical Laboratory Scientist, an Advanced Registered Technologist, and a General Registered Technologist.

### **Dr. Gord Surgeoner, President, Ontario Agri-Food Technologies**

Dr. Surgeoner was born and raised in Southern Ontario and received his agricultural education at the University of Guelph and Michigan State University. His academic studies and research were in the area of entomology.

He was a professor in the Department of Environmental Biology, and then the Department of Plant Agriculture at the University of Guelph until his retirement in January, 2004. Gord has over seventy scientific publications to his credit and serves on numerous provincial and federal advisory committees.

Since his secondment from the University of Guelph in 1999, Gord has been the President of Ontario Agri-Food Technologies, a non-profit organization consisting of members from farm associations, universities, industry and governments. The organization focuses on ensuring that Ontario producers have access to the latest technologies to compete globally and to develop new market opportunities, many of which are beyond food.

In September, 2005 Dr. Surgeoner was invested with the Order of Ontario. This distinguished award, presented by Lieutenant Governor James K. Bartleman, recognizes Dr. Surgeoner's significant contribution to Ontario's agri-food sector.

In addition, Gord has also received the 2007 University of Guelph Alumnus of Honour Award, the Distinguished Teaching Award from the Ontario Agricultural College Alumni Association, the T.R. Hilliard Award for Notable Contribution to Agricultural Extension in the Province of Ontario, an endowed Chair of the University of Guelph bearing his name, the 2002 Award for Contribution to Advancing the Benefits of Biotech for Canadians, and is a recipient of the Queen's Golden Jubilee Award.

Gord is a strong advocate for Canadian agriculture, the Canadian regulatory system and the opportunities Canada has in a global marketplace.

### **Dr. Alison Symington, Professor, School of Biological Sciences and Applied Chemistry, Seneca College**

Dr. Alison Symington received her B.Sc. and PhD from the University of Toronto. Her Ph.D. was obtained in the area of Cell Biology, in the Department of Zoology. After receiving her Ph.D., Dr. Symington worked for almost eight years at Aventis Pasteur as the Manager of the Viral Development Laboratory in the Division of Research and Development. In this capacity she was responsible for the development and production of new vaccines for testing in clinical trials. In 1998, after leaving Aventis Pasteur, Dr. Symington started consulting in Regulatory Affairs for the Pharmaceutical Industry. In this capacity, she provided resources and advice in the areas of government regulations, submission of drug applications and general technical advice in Drug Development. Dr. Symington is a member of the Canadian Association for Professional Regulatory Affairs (CAPRA) and the Pharmaceutical Sciences Group (PSG), and coordinates the Pharmaceutical Regulatory Affairs and Quality Operations Ontario College Graduate Certificate program at Seneca College.

### **Mr. John Wilms, Business Development Executive, Emerging Medical Technologies, IBM Healthcare and Life Sciences**

### **Dr. Brian Wilson, Head, Division of Biophysics and Imaging Ontario Cancer Institute**

### **Dr. Gideon Wolfaardt, Associate Professor and Canadian Research Chair in Environmental Interfaces and Biofilms, Dept of Chemistry and Biology, Ryerson University**

Dr. Wolfaardt is an environmental microbiologist and a Canada Research Chair in Biofilms and Interfaces. The central question of his work is to evaluate the degree that biofilms and the extracellular polymeric substances that they produce facilitate interactions between microbial communities and their physical, biological and chemical environment, and how this knowledge can be applied in engineered and industrial applications. Current projects include a variety of fundamental studies on biofilm form and function, as well as applied research on topics including wastewater treatment, microbial conversion of biomass, environmental behaviour of pathogens, and the environmental fate and behaviour of genetically modified microbes. He has published more than 70 peer-reviewed articles and book chapters