



Canadian Biotechnology Education Resource Centre

The 3rd National Bioscience Educators' Conference

NBEC 2009 Toronto Program

Friday February 20, 2009

Time	Activity 1		
8:00-8:50am	Registration		
8:50-9:00am	Welcome Remarks		
Keynote 9:00-9:55 a.m.	" From Atomic Bombs to Genomics " Dr. David Logan	Activity 2	Activity 3
Session 1 10:05-11:00 am	"DNA from fossils and the benefit of time travel" Dr. Hendrik Poinar (McMaster Ancient DNA Centre, Department of Anthropology, McMaster University)	"Potential therapeutic and preventative solutions for immune disease" (Tentative title) Dr. Marianna Kulka (NRC Institute for Nutrisciences and Health) Webcast	Recombinant DNA Workshop (Seneca@York Faculty)
11:00-11:20 pm	Refreshment Break		
Session 2 11:20-12:15 pm	"Ethical Issues in Personalized Medicine & Direct to Consumer Testing" Dr. Carol Barash (Genetics, Ethics & Policy Consulting, Inc.)	"Game-based learning in the classroom: Successes, pitfalls, and the development of the Genomics Digital Lab Project" Workshop Dr. Jeremy N. Friedberg (Spongelab Interactive Inc.)	
12:15-1:10pm	Lunch		
Session 3 1:10-2:05 pm	"Evolution and the Barcode of Life" Dr. Bob Hanner (Ontario Biodiversity Institute, University of Guelph)	"Where is Ontario's Youth Outreach Heading?" Diane DeMelo Dr. Amy Cook (Ontario Ministry of Research and Innovation)	"Microbiology" Workshop (Seneca@York Faculty)
2:05-2:25 p.m.	Refreshment Break		
Session 4 2:20-3:15 pm	"More than just a sweet thing-Sugars and the immune system" (Webcast) Dr. Rob Pon, (NRC Institute for Biological Sciences)	"DNA Barcoding" Bioinformatics Workshop Dr. Alison Symington (Canadian Biotechnology Education Resource Centre) Dr. Bob Hanner (Canadian Barcode of Life Network, Biodiversity Institute of Ontario & Department of Integrative Biology, University of Guelph)	

Saturday February 21, 2009

Time	Activity 1		
8:00-8:50am	Registration		
8:50-9:00am	Welcome Remarks	Activity 2	Activity 3
Session 1 9:10-10:00 am	"The Science & Social Impact of Genomics" Dr. Shane Green (Ontario Genomics Institute)	Regulation of Biotech Products Health Canada (to be confirmed)	Recombinant DNA Workshop (Seneca@York Faculty)
Keynote (Webcast) 10:10-11:00 am	"Science As I have seen it: a Journalist's Perspective" Bob MacDonald webcast (Journalist/Author/Host of CBC's Quirks & Quarks)		
11:00-11:10 pm	Refreshment Break		
Session 2 11:10 –noon	"Transgenic Crops – how and why novel traits are introduced into our food plants" Dr. Katalin Hudak (York University)	"Genomics in the Classroom" Bob Malyk (Ridley College)	
Noon-1:00pm	Lunch		
Session 3 1:00p– 1:50 pm	"Stem Cells in Health and Disease" Dr. Jean Wang (University Health Network)	"Ontario Curriculum Review Science 9 – 12" Maureen Callan (Ontario Ministry of Education)	"Microbiology" Workshop (Seneca@York Faculty)
1:50-2:10 pm	Refreshment Break		
Session 4 2:10p– 3:00pm	"Neurogenetics of Circadian Rhythms" (tentative title) Dr. Joel Levine University of Toronto (Mississauga)	Transforming Science Curriculum: Embedding an Electronic Journal Peggy Pritchard (University of Guelph)	"DNA Barcoding" Bioinformatics Workshop Dr. Alison Symington (Canadian Biotechnology Education Resource Centre)
Session 5 3:10 – 4:00pm			

Session Details

Friday, February 20, 2009

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

**Cindy Hazell, Senior and Academic Vice President, Seneca College
Mr. Jeff Graham, Chairman, Canadian Biotechnology Education Resource Centre**

Plenary Session (9:00 – 9:55 a.m.)

“From Atomic Bombs to Genomics”

An historical outline of the birth and development of modern biotechnology.

Dr. David Logan, Professor Emeritus, York University

Breakout Session 1A (10:05 – 11:00 a.m.)

“DNA from fossils and the benefit of time travel”

This presentation will explore the possibilities of extracting DNA from fossil remains and using it to solve long-standing questions about origins, migrations and extinction. The feasibility of resurrecting extinct animals via cloning will also be discussed.

Dr. Hendrik Poinar, Canada Research Chair in Paleogenetics, Professor, Ancient DNA Centre, Department of Anthropology, McMaster University

Breakout Session 1B (10:05 – 11:00 a.m.)

“Potential therapeutic and preventative solutions for immune disease” (Webcast)
(Tentative title)

Dr. Marianna Kulka (NRC Institute for Nutrisciences and Health)

Breakout Session 1C (10:05 – 11:00 a.m.)

Recombinant DNA Workshop (25 person limit)

Facilitator: Dr. Mike Gadsden, Faculty Seneca@York

Refreshment Break (11:00-11:20 a.m.)

Breakout Session 2A (11:20 a.m. – 12:15 p.m.)

“More than just a sweet thing-Sugars and the immune system” (webcast)

Dr. Rob Pon, Immunologist, NRC Institute for Biological Science

Breakout Session 2B (11:20 a.m. – 12:15 p.m.)

Networking

Breakout Session 2C (11:20 a.m. – 12:15 p.m.)

Game-based learning in the classroom: Successes, pitfalls, and the development of the Genomics Digital Lab Project. Workshop (25 person limit)

Games and other rich media teaching assets have enormous potential in education. But making them work in the classroom is a huge challenge. Hardware, network security, curriculum, and available time can make it difficult to effectively use these assets. This workshop will focus on what works and does not work in the classroom and why. We'll also be looking at the Genomics Digital Lab living software project as an example of using games to teach. Genomics Digital Lab: Plant Cells (GDLv3), recently was awarded first prize in the Interactive Media category from the journal Science and National Science Foundation's Visualization Challenge 2008.

The Genomics Digital Lab (GDL) is a continually expanding on-line learning environment where users experience the world of biology through discovery-based learning. GDL was developed as a series of curriculum-aligned and integrated games, modules, and interactive simulations covering an array of topics in biology. Each module deals with aspects of the whole organism and related cell biology and biochemistry.

Dr. Jeremy N. Friedberg, (Spongelab Interactive Inc.)

Lunch (12:15-1:10pm)

Breakout Session 3A (1:10pm – 2:05pm)

"Evolution and the Barcode of Life"

The varied mutational changes that accumulate in DNA sequences among species across deep time are proving to be powerful markers for the identification of species. Because DNA is found in every cell, this makes possible the forensic identification of degraded or fragmentary biological remains. DNA barcoding, a standardized application of this technique, is driving new insights into the diversity of species on earth and has also been harnessed for food authenticity testing and a myriad other applications. The relative simplicity of the technique is here demonstrated in a broad collaborative project involving researchers, university and even high school students to monitor patterns of market substitution in Canadian seafood."

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

Breakout Session 3B (1:10pm – 2:05pm)

"Where is Ontario's Youth Outreach Heading?"

Learn about how the Ministry of Research and Innovation is acting as a catalyst for driving youth outreach and innovation-based activities that will enable youth to view science, technology, engineering, and math as key to their long-term development and career aspirations.

Join us in exploring new opportunities for you to gain skills and knowledge that will better enable you to support your students in their innovation endeavours..

Ms. Diane DeMelo, Policy Analyst, (Ontario Ministry of Research and Innovation)
Dr. Amy Cook, Senior Policy Advisor, (Ontario Ministry of Research and Innovation)

Breakout Session 3C (2:10 – 2:50 p.m.)

"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.

Dr. Marion Kist and Dr. Linda Facchini (Faculty Seneca@York)

Refreshment Break (2:05-2:25 p.m.)

Breakout Session 4A (2:20pm – 3:15pm.)

"Ethical Issues in Personalized Medicine & Direct to Consumer Testing"

Personalized medicine and direct to consumer genetic testing represent strategic solutions to health care reform. The former, that is, giving the right medicine to the right patient in the right dose, or giving the right prescriptive advice for hereditary risk prevention, represents a medical elixir for poor outcomes and exorbitant costs. The latter, DTC testing, represents a strategic solution to consumer concerns about privacy violations and genetic discrimination risks. As with the realization of any new technology, promises face off against potential perils, though the latter tends to be muffled by the enthusiasm for the former. This presentation will provide the ethical context for better understanding the ethical dilemmas and policy tradeoffs involved in adopting these technological approaches. Concern about how to ethically balance the competing interests of stakeholders; consumers' right to know, government's right to protect and corporate responsibility in ensuring that products and services are used ethically are but some of the issues students need to better understand in order to participate fully not only as consumers but as citizens engaged in setting policy. Given ethical concerns about the ownership and privacy of genetic information generated by such tests, and the likely growth in consumer appetite for personal genetic knowledge, the time is ripe to distinguish scientific from ethical concerns. Evaluating the effectiveness of ethics education will well serve all interests and approaches to tackling such a difficult task will be proposed.

Dr. Carol Isaacson Barash, Ph.D., Principal, Genetics, Ethics & Policy Consulting Inc.

Breakout Session 4B (2:00 – 2:50 p.m.)

Networking

Breakout Session 4C (2:20 – 3:15 p.m.)

"DNA Barcoding" Bioinformatics Workshop

Bringing DNA Barcoding to the classroom. This hands-on session will provide information and experiential learning on DNA Barcoding that can be used directly anywhere that is equipped with a computer. Using cutting edge research data, learn how to identify species, look at species divergence and how DNA technology is being used to study Biodiversity.

Dr. Alison Symington (Director of Programs, Canadian Biotechnology Education Resource Centre)

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

Saturday, February 21, 2009

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

Breakout Session 1A (9:10 – 10:00 a.m.)

"The Science & Social Impact of Genomics"

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.

**Dr. Shane K. Green, Program Director, Ethics, Social Impact & Outreach
Ontario Genomics Institute**

Breakout Session 1B (9:10 – 10:00 a.m.)

"Regulation of Biotech Products"

Health Canada

Breakout Session 1C (9:10 – 10:00 a.m.)

Recombinant DNA Workshop (25 person limit)

Dr. Mike Gadsden, Faculty Seneca@York

Plenary Session (9:00 – 10:00 a.m.)

Breakout Session 2A (11:10 – noon)

"Transgenic Crops – how and why novel traits are introduced into our food plants"

This session will describe the "how-to" involved in making a transgenic plant and will present some examples of genetically-modified crops currently grown in Canada. Recent developments in controlling the timing or location of gene expression, along with strategies to limit transgene spread to the environment will also be discussed. The session will end by outlining how to transiently express a foreign protein in plant leaves as part of a laboratory exercise.

Dr. Katalin Hudak, Associate Professor, Department of Biology, York University

Breakout Session 2B (11:10 a.m. – noon)

"Genomics in the Classroom"

Bob will share some of his teaching strategies.

Mr. Bob Malyk, Ridley College

Breakout Session 2C (11:10 a.m. – noon)

Networking

Breakout Session 3A (1:00 – 1:50 p.m.)

“Stem Cells in Health and Disease”

Stem cells are master cells that provide the source material for all organs and tissue. They are found in the embryo and as rare cells in adult tissues including blood, skin, muscle and intestines. Because of their regenerative capabilities, stem cells have the potential to treat or cure diseases. Recently, scientists have discovered ways to reprogram adult human cells to behave like stem cells, bypassing the ethical issues associated with the use of human embryonic stem cells. In addition, recent evidence suggests that tumour growth may also be driven by stem cells, a notion which has important implications for cancer treatment.

Dr. Jean Wang, Researcher, Division of Cell and Molecular Biology University Health Network

Breakout Session 3B (1:00 – 1:50 p.m.)

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

This session will focus on the changes to the Ontario curriculum.

Maureen Callan, Education Officer, Ontario Ministry of Education

Breakout Session 3C (1:00 – 1:50 p.m.)

“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.

Dr. Marion Kist and Dr. Linda Facchini (Faculty, Seneca@York)

Breakout Session 4A (2:00 – 2:50 p.m.)

“Neurogenetics of Circadian Rhythms” (tentative title)

Dr. Levine’s research is focused on gene expression that leads to rhythms, biological clocks and ultimately social behaviour in fruit flies

Dr. Joel Levine, Canada Research Chair in Neurogenetics, Assistant Professor, Department of Biology, University of Toronto at Mississauga

Breakout Session 4B (1:00 – 1:50 p.m.)

“Transforming Science Curriculum: Embedding an Electronic Journal”

The designers of the University of Guelph's new first year nanoscience course have introduced an approach to embedding research, writing and analytical skills that gives students the true-to-life experience of writing for publication that builds on their own interest in the subject. Following the process of scholarly publication, students are researchers, authors, and reviewers. Students are supported throughout this project through appropriately-timed workshops, and tutorials. Rubrics for the assessment of the submitted manuscripts and the peer review provide students with more insight into what constitutes work that is below, meets and exceeds expectations. The

students' excitement about the possibility of being published at the end of the course fires their imaginations and inspires them to do their best.

Peggy A. Pritchard, MLIS, Academic Liaison Librarian for Engineering, Chemistry & Physics, University of Guelph

Breakout Session 4C (2:00 – 2:50 p.m.)

"DNA Barcoding" Bioinformatics Workshop

Bringing DNA Barcoding to the classroom. This hands-on session will provide information and experiential learning on DNA Barcoding that can be used directly anywhere that is equipped with a computer. Using cutting edge research data, learn how to identify species, look at species divergence and how DNA technology is being used to study Biodiversity.

Dr. Alison Symington, Director of Programs, Canadian Biotechnology Education Resource Centre

SPEAKER BIOGRAPHIES

Dr. Carol Isaacson Barash, Ph.D., Principal, Genetics, Ethics & Policy Consulting Inc.

Carol Isaacson Barash, Ph.D. is a recognized expert in genetics/genomics and issues related to its integration into health care delivery. She is currently Principal of Genetics, Ethics & Policy Consulting which she founded in 1994. Dr. Barash has worked with leading non-profit, academic centers and industry in the U.S. and abroad on a broad range of medical device and health IT commercialization issues, including market opportunity assessments, business and regulatory strategy, ethics user/provider/patient education and health policy analyses.

Carol is known for her work in genetic diagnostics, e-health technologies, personalized medicine and commercializing life science innovations. In 1995 she helped Rep. Louise Slaughter introduce genetic privacy protection legislation that evolved into GINA. Since 2000, she has been known for her work in personalized medicine, with a focus on provider knowledge, patient access and ethical issues. Her twenty plus years of diverse experience includes e-health and health IT design and adoption strategy, molecular diagnostic and stem cell regulation, strategic business planning for commercializing emerging genetic/genomic technologies and health IT. She has done pioneering work using ethnography to identify barriers and drivers to genetics innovation adoption. Her background also includes a broad range of health care research, policy analysis, and medical/health education. In addition, she has served as Principal Investigator on federally funded applied research studies, an external grant reviewer for NIH and private foundations, and is published extensively.

She is frequently asked to write journal articles and speak at industry conferences. Her first book 'Just Genes': The Ethics of Genetic Technologies was published by Praeger Greenwood, in 2007. She is a contributing author to several other books on genetics and ethics, has published over 25 journal articles and is a frequent speaker at industry conferences. Her work has been featured in numerous media, including Newsweek (1996), BioIT World (2002, 2003), BioNews (2006), National Institute of Environmental Health Sciences (2003), MSNBC (2000), NHK, Japan Broadcasting (1997), WSJ TV (1993), Baltimore Sun, (2007).

Prior to founding GEPCI, Dr. Barash directed the first federally funded study of genetic discrimination, directed program evaluations and policy analyses at the US DHHS, Office of the Inspector General, Office of Inspection & Analysis, and at the Center for the Study of Drug Development and Regulation, Tufts New England Medical Center and served on the Institutional Review Board (IRB) at the New England Deaconess Hospital.

She received her Ph.D. in philosophy from the University of Chicago (Boston College); high honors, and her B.A. from Bates College and Manchester College, Oxford University.

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

Maureen Callan is an Education Officer at the Ministry of Education, Curriculum, and Assessment Policy Branch. In this capacity, she is responsible for the Curriculum Review for all science courses Grades 9-12. Maureen has teaching experience in science in both the elementary and secondary panels. In addition, she has experience as a curriculum consultant at the board.

Dr. Amy Cook, Senior Policy Advisor, Ministry of Research and Innovation, Government of Ontario

Amy Cook is a Senior Policy Advisor in the Outreach unit of the Ministry of Research and Innovation. Prior to joining MRI, she completed her Ph.D. in breast cancer research at the University of Western Ontario where she also started CRAM Science - a popular science e-zine for teens. She also recently spent a year in Vancouver working in the programs and exhibits department at Science World...and hiking and snowshoeing much of BC's great trails.

Ms. Diane DeMelo, Policy Analyst, Ministry of Research and Innovation, Government of Ontario

Diane is currently a Policy Analyst with the Outreach, Promotion & Business Development Branch at the. She is the lead for the Teachers' Science & Technology Outreach Program (TSTOP), a government program that helps bring awareness and inspiration to teachers and their students regarding the exciting research taking place in Ontario. She also provides support to other MRI youth initiatives. Previously, Diane worked with the Ministry of Natural Resources' Communications Branch. She graduated with a Hon. B.A. from the University of Toronto.

Dr. Linda Facchini, Professor, School of Biological Sciences and Applied Chemistry, Seneca@York

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.

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

Jeremy holds an honors B.Sc. in genetics from the University of Western Ontario and a Doctorate in molecular genetics & biotechnology from the University of Guelph. He has been extensively involved in both public and private scientific education outreach programs, teaching about genetics & cell biology, and consults & designs for a number of textbooks & major interactive educational exhibits created for the general public. Jeremy has been teaching since 1998 and has taught at a number of Ontario Universities including the University of Western Ontario, the University Guelph, Wilfrid Laurier University, University of Waterloo, and the University of Toronto. Currently he is a partner in Spongelab Interactive, a Toronto based company devoted to immersive learning through educational games and interactive media.

Dr. Mike Gadsden, Professor, School of Biological Sciences and Applied Chemistry, Seneca@York

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. 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. Katalin Hudak, Associate Professor of Biology, York University

Katalin Hudak completed her PhD at the University of Waterloo and post-doctoral studies at the Biotechnology Centre for Agriculture and the Environment at Rutgers University. She joined York University in 2002 and is currently an Associate Professor in the Department of Biology. Dr. Hudak's research focuses on understanding the mechanism of action of plant-derived antiviral proteins and her work is funded by NSERC and CFI. She holds three patents as a direct result of her research. Dr. Hudak is a recipient of an Ontario Premier's Research Excellence Award and the Faculty of Science and Engineering Excellence in Teaching Award in the senior tenure-stream faculty category. She teaches a third year course on gene expression and a fourth year biotechnology course.

Dr. Marion Kist, Professor, School of Biological Sciences and Applied Chemistry, Seneca@York

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. Joel Levine, Canada Research Chair in Neurogenetics, Assistant Professor, Department of Biology, University of Toronto at Mississauga

Dr. David Logan, Professor Emeritus, York University

Dr. David Logan. David is currently a Professor Emeritus at York University having retired in 2002 as the Associate Dean of Applied Science. David has previously worked at McMaster University and the US National Institutes of Health.

Mr. Bob Malyk

Bob Malyk teaches Grades 11,12 and Advanced Placement Biology at Ridley College in St. Catharines, Ontario. Bob's teaching career spans 37 years and his skills have been recognized widely. He has been the recipient of numerous awards including the CIBA-Geigy Award of Teaching Excellence from the National Association of Science Teachers, the Friend of the Environment Award from USEPA and President Ronald Reagan, an Outstanding Biology Teacher Award from the National Association of

Biology Teachers, the Prime Minister's Award for Teaching Excellence and most recently, the Genomics Teaching Prize from the Ontario Genomics Institute.

Mr. Dan Phillips, Chair, School of Biological Sciences and Applied Chemistry, Seneca@York

Dan's 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.

Dan's 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. At Seneca College Dan has 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.

Dr. Hendrik Poinar, Canada Research Chair in Paleogenetics, Professor, Ancient DNA Centre, Department of Anthropology, McMaster University

BIO

Ms. Peggy Pritchard, MLIS, Academic Liaison Librarian for Engineering, Chemistry & Physics, University of Guelph

Peggy Pritchard is the Academic Liaison Librarian for Engineering, Chemistry and Physics at the University of Guelph, and Editor and co-author of the CIHR-funded book "Success Strategies for Women in Science: A Portable Mentor" (2005, Elsevier Academic Press). Her book was inspired by the female graduate students in the Department of Microbiology & Immunology, Queen's University, where she developed and taught an award-winning, graduate-level communications skills course. Since joining the University of Guelph in November 2007, she has worked closely with the curriculum development team in the College of Physical and Engineering Sciences to embed information literacy, writing, and analytical skills training into their first year, undergraduate course in nanoscience.

An experienced career counsellor, Ms. Pritchard has also provided mentoring advice and support to students interested in pursuing careers in science. In 2007-08, she wrote monthly, web-based career columns for the "Synapse Outreach Network in Cellsignals" <<http://cellsignals.ca/sonic/>>, a network dedicated to the support of teenagers interested in health research (see "Ask the SONIC Coach").

Her commitment to science education and mentoring has resulted in seminar invitations from universities in North America and Europe. She continues to present at conferences hosted by science associations, women in science organizations, societies for teaching and learning in higher education, and library associations.

Dr. Alison Symington, Director of Programs, Canadian Biotechnology Education Resource Centre

Alison Symington is the Program Director at the Canadian Biotechnology Education Resource Centre. Prior to July 2008, she was a Professor and Program Coordinator at Seneca College. In this capacity, she was responsible for designing and teaching the Biotechnology senior level course as well as a variety of other courses relating to Biotechnology and the accompanying industry as well as providing resources to students to encourage and maintain student success. During her tenure at Seneca, Alison was also involved in development of outreach programs to high schools in biotechnology and bioethics and has been involved in the Sanofi Aventis BioTalent Challenge for High School students for over ten years. From 1990-1998, Alison was the Manager of Viral Development at sanofi pasteur, the largest Biotechnology company in Canada and has consulted for the biotechnology industry until 2008.

Dr. Jean Wang, Researcher, Division of Cell and Molecular Biology University Health Network

Dr. Jean Wang attended medical school at the University of Toronto and went on to obtain Certification in Adult Hematology. She completed her PhD in 2004 in the lab of John Dick in Toronto, characterizing the biology of normal and leukemic human hematopoietic stem cells. Currently she is an Assistant Professor

in the Department of Medicine at the University of Toronto and continues to work closely with John Dick in the Division of Cell and Molecular Biology at the University Health Network in Toronto in the areas of normal and leukemic hematopoiesis.