

Fourth National Bioscience Educators Conference
and
Biotech Alive! Student Biotechnology Conference
Princess Street Campus, Red River College
Winnipeg, Manitoba, Canada
February 16-18, 2010

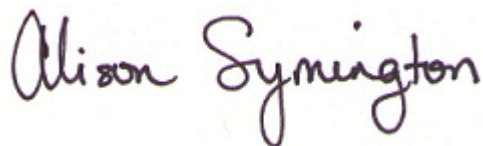
Welcome to the National Bioscience Educators Conference. You are the vanguard, the pioneers, of the teaching and learning of biotechnology and bioscience. The Ernst and Young Global Biotechnology Report indicated that one-third of the economic activity in the world now has biotechnology or bioscience components. Canada has been in the forefront of biotechnology, especially in areas of agricultural biotechnology and medical research, but in every part of the world countries have geared or are gearing up to participate in the bio-economy. This conference is about the competitive advantage that education in biotechnology and bioscience can provide.

The conference is designed to bring together educators and experts to exchange tangible methods of bringing biotechnology and bioscience into the classroom. Our instructions were clear – “We want things teachers can use on Monday morning.” Biotechnology touches almost every part of normal life and it is vitally important students are aware of the impact it will have on the economy and the environment of Canada and globally in the 21st century.

Bioscience Education Canada (BEC) is a national non-profit charitable organization with a mandate to improve the quality of bioscience education in Canadian schools and encourage more young Canadians to pursue studies and careers of Canada's growing bioeconomy. Our mission with our partners such as MindSet is to build a 'made in Canada' solution to the education of young people and to better inform the public about biotechnology. To this end, the speakers at this conference will be web-archived and available to schools across the country.

With over 30 national and local organizations involved in this conference, you can tell that they think what we are doing here is important. You are here so you think it is important. Not only that, Manitoba is an important part of Canada's bio-economy, no doubt. Biotechnology, bioscience and life science education in Manitoba is leading the country in many ways. So, we are here because we think you are important.

We would like to thank all our partners and sponsors for making this programme possible. I would especially like to recognize Red River College for making the Princess Street Campus available. Without them, there would not have been a conference of this quality here in Winnipeg. **So, welcome, learn, grow but, most of all, ENJOY!**

A handwritten signature in purple ink that reads "Alison Symington". The signature is written in a cursive, flowing style.

Dr. Alison Symington, Executive Director, Bioscience Education Canada

Bioscience Education Canada, Life Sciences, Red River College and MindSet acknowledge the following sponsors.

Financial Support

Council for Biotechnology Information	Manitoba Innovation, Energy and Mines
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CancerCare	Composites Innovation Centre

Faculty of Medicine, University of Manitoba
Biomedical Engineering Group, Faculty of Engineering, University of Manitoba
National Research Council Institute of Biodiagnostics
Richardson Centre for Functional Foods and Nutraceuticals

BioOlympics

Life Science Association of Manitoba	Animal Hospital of Manitoba
Agrianalytical	Pharmaceutical Manufacturing, RRC

Conference Committee

Jonathon Frate, Director, Member Services, Life Sciences Association of Manitoba
Lucy St. Lawrence, Science Consultant, Winnipeg School Division
Kirk Brandt, Department Head, Industrial Arts, Grant Park High School, Winnipeg School Division
Bob Adamson, Science Consultant, Pembina Trails School Division
John Murray, Science and Mathematics Consultant, Manitoba Education
Bob Brown, Scientific Advisor, MindSet, the Manitoba Network for Science and Technology
Norman Lee, Coordinator, MindSet, the Manitoba Network for Science and Technology

National Bioscience Educators Conference

Program - Tuesday, February 16

4:00 p.m.	Student BioOlympics	Multi-purpose Room, Princess Street Campus
5:00 p.m.	Registration	Multi-purpose Room, Princess Street Campus
6:00 p.m.	Welcome to the National Bioscience Educators' Conference	Dr. Alison Symington, Executive Director, Bioscience Education Canada (BEC)
	Welcome to Red River College	Louise Gordon, Dean, School of Health Sciences and Community Services, Red River College
	Dinner	Cafeteria, Princess Street Campus, Red River College
6:40 p.m.	Biotechnology and Humanity's Critical Survival Issues	Allan Sturko, Industrial Technology Advisor, National Research Council, Industrial Research Assistance Program
7:00 p.m.	Teacher BioOlympics	Dr. Darren Fast, Executive Director (Acting), Life Science Association of Manitoba
9:00 p.m.	Review of the Conference Program	Dr. Alison Symington, Bioscience Education Canada

Program - Wednesday, February 17

7:30 a.m.	Registration and Coffee	
8:15 a.m.	Depart for St. Boniface Hospital Research Centre	
8:30 a.m.	Welcome to National Bioscience Educators' Conference	Dr. Alison Symington, BEC
	Greetings - Manitoba Innovation, Energy and Mines	The Honourable David Chomiak, Minister, Manitoba Innovation, Energy and Mines
	Programs of the National Microbiology Laboratory	Joy Stadnichuk, Community Liaison Officer,
8:35 a.m.	Overview and Accomplishments of the NML	Dr. Frank Plummer, Scientific Director General, Public Health Agency of Canada
8:45 a.m.	Overview and Accomplishments of the	Dr. John Copps, Deputy Director, National Centre for Foreign Animal Disease
8:55 a.m.	Overview of the NML Facility	Joy Stadnichuk, Community Liaison Program Officer
9:15 a.m.	A Closer Look at Epidemiology	Dr. Carole Beaudoin, Epidemiologist, Public Health Agency of Canada

9:30 a.m.	Genomics at the NML	Dr. Morag Graham, Research Scientist Public Health Agency of Canada
9:45 a.m.	Student Programs at NML	Tandice Wiwchar, Senior Human Resources Assistant, Public Health Agency of Canada
10:00 a.m.	Depart for Tours	
Tour 1 – Composites Innovation Centre		
Tour 2 – Richardson Centre for Functional Foods and Nutraceuticals		
Tour 3 – Biomedical Engineering and Nanotechnology, Faculty of Engineering, University of Manitoba		
Tour 4 – Microbial Genomics for Biofuels and Co-Products from Biorefining Processes, Faculty of Agriculture and Food Science, University of Manitoba		
Noon – Lunch, Cafeteria, Princess Street Campus, Red River College		
12:45 p.m.	Keynote – Use of Serious Games in Education,	Dr. Reyn Redekopp, Faculty of Education, University of Manitoba
1:15 p.m.	Slot 1 Sessions	
	Video Games Lab	
	Genomics in the Classroom	
	Agricultural Biotechnology in the Classroom	
	Microarrays in the Classroom	
2:00 p.m.	Slot 2 Sessions	
	Video Games Lab	
	Agricultural Biotechnology in the Classroom	
	Food, Chemistry and Biotechnology	
	Skills for Careers in Biotechnology and Pharmaceutical Industries	
2:45 p.m.	Break	
3:00 p.m.	Slot 3 Sessions	
	Mobile Learning and Biology	
	Genomics in the Classroom	
	Skills for Careers in Biotechnology and Pharmaceutical Industries	
	Microarrays in the Classroom	
3:45 p.m.	Closing Remarks – John Murray, Science Consultant, Manitoba Education	
6:00 p.m.	Genome Prairie’s “Dinner and a Movie” Cafeteria, Princess Street Campus, Red River College	
7:00 p.m.	Cancer Warrior – The work of Dr. Judah Folkman and his efforts to find a cure for cancer	
9:00 p.m.	Closing Remarks – Lucy St. Lawrence, Science Consultant, Winnipeg School Division	

Program - Thursday, February 18

- 8:00 a.m. Registration
- 8:30 a.m. Opening Remarks, Manitoba Education, Province of Manitoba
- 8:45 a.m. The Promise of Agricultural Biotechnology, Dr Mary Alton Mackey, International Food Consultant
- 9:15 a.m. Tours
- Tour 1 – Youth Biomedical Laboratory, Niji Mahkawa School
- Tour 2 – Institute of Biodiagnostics, National Research Council
- Tour 3 – Breast Cancer Research Laboratory, CancerCare
- Tour 4 – Genomics Centre, Buhler Centre
- 10:45 a.m. Slot 4 Sessions
- OneNote – Organizing Life Science Information and Projects
Careers in the Biotechnology Sector
Dreaded Red: Simulation of an Epidemic
Life Science and Bioethics
- 11:30 a.m. Slot 5 Sessions
- OneNote – Organizing Life Science Information and Projects
Life Science and Bioethics
Dreaded Red: Simulation of an Epidemic
Careers in the Biotechnology Sector
- 12:15 Lunch, Cafeteria, Princess Street Campus, Red River College
- 12:45 p.m. Life Science in Space, Dr. Nicole Buckley, Director, Physical and Life Science, Canadian Space Agency
- 1:15 p.m. Teacher Round Tables
- Educators who have developed their own biotechnology lessons will be on-hand to share their work three times. There will be three, 20 minute sessions presenting 10 topics.
- 2:30 Break
- 2:45 Teacher Interest Groups
- Time has been set aside for educators to meet others with similar interests who are interested in continuing to share ideas, knowledge and programs. .
- 3:15 Closing Remarks, Dr. Alison Symington, Executive Director, BEC

National Bioscience Educators Conference

Program - Tuesday, February 16

4:00 p.m.	Student BioOlympics	Multi-purpose Room, Princess Street Campus, Red River College
5:00 p.m.	Registration	
6:00 p.m.	Welcome to the Conference	Dr. Alison Symington, Executive Director, Bioscience Education Canada

Alison Symington is currently the Executive Director of Bioscience Education Canada, formerly the Canadian Biotechnology Resource Centre (CBERC). Previously, she was a professor and program coordinator at Seneca College's School of Biological Sciences and Applied Chemistry from 1998-2008. Dr. Symington has worked as an associate of Bioscience Education Canada on such projects as the Sanofi-Aventis BioTalent Challenge, the York Biotech Toolbox and several laboratory courses for high school teachers. Prior to that, Dr. Symington was a development scientist at sanofi pasteur, Canada's leading vaccine research and manufacturing company.

Welcome to Red River College	Louise Gordon, Dean, School of Health Sciences and Community Services, Red River College
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Red River College is renowned for providing accessible, innovative, applied learning and research in an advanced environment, creating skilled graduates to drive the Manitoba economy. The mission of RRC is to enable students to build a career, enhance quality of life, and contribute to Manitoba's economic and social prosperity through exceptional applied education and research. RRC is Manitoba's largest institute of Applied Learning with more than 32,000 enrolments in more than 110 full-time programs on eight campuses in Manitoba. The Health Sciences Department with 20 programs in the health sciences, including the new pharmaceutical manufacturing, is a major sponsor for the conference.

6:10 p.m.	Dinner, Cafeteria, Princess Street Campus, Red River College	
6:40 p.m.	Biotechnology and Humanity's Critical Survival Issues	Allan Sturko, Industrial Technology Advisor, National Research Council, Industrial Research Assistance Program

In ***High Noon 20 Global Problems, 20 Years to Solve Them***, J. F. Rischard describes the 20 problems that will determine the future of humanity. Among these issues are starvation, climate change, energy, loss of biodiversity, infectious disease, pollution and fresh water shortages. The opening keynote examines some of these issues and the role that biotechnology may have to play in the solution of some of these issues.

Allan Sturko is one of province's most respected biotechnology professionals because of his extensive knowledge of biotechnology, especially in the Province of Manitoba. He has been a staunch supporter of biotechnology of education in Manitoba, speaking at many events and providing direction for many activities and events.

7:00 p.m.	Teacher BioOlympics	Dr. Darren Fast, Executive Director (Acting), Life Science Association of Manitoba
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The Teacher BioOlympics is an evening of hands-on fun and learning. Participants will have an opportunity to try up to 10 biotechnology/life science activities. The activities include laser surgery, endoscopy, DNA separation, robotics, pharmaceutical manufacturing, testing composite materials and laboratory skills. Lots of fun and prizes to be had! Students will do this activity at another time.

Darren Fast, PhD, is the President and founder of Solalta Advisors. Previously, Darren was Chief Technology Officer at Lombard Life Sciences, a partner of the Western Life Sciences Venture Fund LP, where he identified and evaluated more than 300 early stage technologies for investment. In addition to assessing and investing in technology, Prior to Lombard Life Sciences, Darren was Manager, Product Planning and Development at Viventia Biotech where he was responsible for the development of several human therapeutics projects. Darren has a Ph.D. in biochemistry from the University of Alberta and a M.Sc. in chemistry from the University of Manitoba.

9:00 p.m. Review of Conference and Closure Dr. Alison Symington, BEC

Program - Wednesday, February 17

7:30 a.m. Registration and Coffee

8:10 a.m. Depart for St. Boniface Hospital Research Centre

8:30 a.m. Opening Remarks Dr. Alison Symington, BEC

Programs of the National Microbiology Laboratory Joy Stadnichuk, Community Liaison Officer,

Joy Stadnichuk is the Community Liaison Program Officer at the Canadian Science Centre for Human and Animal Health (CSCHAH). She has been working at the facility since 2005 and provides internal communication services as well as serving as a tour coordinator for visitors to the building. Joy will be providing an overview of the CSCHAH that includes a brief history and a closer look at some of the containment features that are unique to this world-class facility.

8:35 a.m. Overview and Accomplishments of the NML Dr. Frank Plummer, Scientific Director General, Public Health Agency of Canada

Dr. Frank Plummer is the Chief Science Advisor of the Public Health Agency of Canada and the Scientific Director General of the National Microbiology Laboratory (NML) in Winnipeg. He has been recognized in Canada and abroad for his work in public health and science, and has received numerous accolades, including his investiture in the Order of Manitoba, appointment as Officer to the Order of Canada in 2006 and induction into the Royal Society of Canada in that same year. He was also named Canada's Health Researcher of the year by the Canadian Institutes of Health Research in 2007. Dr. Plummer will be providing an overview of the NML programs and functions as well as highlighting some of the key accomplishments of the NML nationally and internationally.

8:45 a.m. Overview and Accomplishments of the Dr. John Copps, Deputy Director, National Centre for Foreign Animal Disease

Dr. John Copps is the Deputy Director of the National Centre for Foreign Animal Disease (NCFAD) and formerly the Chief Animal Care Veterinarian for the facility. In addition to being a key player in the development of the animal care program at the CSCHAH, Dr. Copps has worked in the Containment Level 3 and Level 4 areas with such diseases as SARS, H1N1, West Nile virus, Avian Influenza and the 1918 Flu. Dr. Copps will be providing an overview of the NCFAD and highlighting some of the key accomplishments and roles this department plays in Canada and internationally.

8:55 a.m. Overview of the NML Facility Joy Stadnichuk, Community Liaison Program Officer

9:15 a.m. A Closer Look at Epidemiology Dr. Carole Beaudoin, Epidemiologist,
Public Health Agency of Canada

Dr. Carole Beaudoin is the Head of the Epidemiology Section at the National Microbiology Laboratory. Carole provides epidemiologic support to the various lab program areas; and also has an active research portfolio in HIV and Sexually Transmitted Infections. While there are a variety of investigative and analytic tools used in public health epidemiology, Carole will provide an overview of the role of social networks in the spread of infectious diseases.

9:30 a.m. Genomics at the NML Dr. Morag Graham, Research Scientist
Public Health Agency of Canada

Dr. Morag Graham is a Research Scientist and Scientific Head of the National Microbiology Laboratory's Genomics Core Facility. She joined the NML in 2004 to coordinate this Science Technology and Core Services unit. The mandate of this area is to provide quality genomic products, services and infrastructure to support NML's reference testing, surveillance and research programs. Dr. Graham will be providing an overview of how Genomics plays a very key role in assisting other programs to do work conducted at the NML.

9:45 a.m. Student Programs at NML Tandice Wiwchar, Senior Human Resources
Assistant, Public Health Agency of Canada

Tandice Wiwchar is the Student Staffing Coordinator for the Public Health Agency of Canada in Winnipeg. She has been a part of the Human Resources team providing services to the National Microbiology Laboratory since the summer of 2008, and has been responsible for student staffing for the past year. Her presentation will focus on the types of work experience opportunities available to students through the Federal Government Student Employment Programs.

10:00 a.m. Depart for Tours

10:30 Arrive Tours

Participants choose one tour from these University of Manitoba affiliated organizations.

Tour 1 – Composites Innovation Centre, SmartPark, University of Manitoba

The Composites Innovation Centre Manitoba Inc. (CIC) is a not-for-profit corporation that is jointly sponsored by private industry and government. Its mandate is to support and stimulate economic growth through innovative research, development and application of composite materials and technologies for manufacturing industries including the development of biocomposites. Host: Mercedes Alcock

Tour 2 – Richardson Centre for Functional Foods and Nutraceuticals, SmartPark, University of Manitoba

Located in Smartpark Research and Technology Park, University of Manitoba, the Richardson Centre for Functional Foods and Nutraceuticals is dedicated to the discussion, discovery, and development of functional foods and nutraceuticals, with a focus on the crops of the Prairies. RCFFN innovates with food products to improve the health of both humans and animals. Host: Dr. Curtis Rempel

Tour 3 – Biomedical Engineering and Nanotechnology, Faculty of Engineering, University of Manitoba

This presentation will outline some of the application of bioengineering and nanotechnology to life science and medicine. The Faculty of Engineering, University of Manitoba has recently created a bioengineering group to advance teaching and research of the applications of bioengineering – the application of engineering to biology and medicine, including nanotechnology and bioinformatics. Host: Dr. Sherif Sherif

Tour 4 – Microbial Genomics for Biofuels and Co-Products from Biorefining Processes, Faculty of Agriculture and Food Science, University of Manitoba

The aim of this research is to enable biorefineries to generate products (ethanol, hydrogen, and co-products) from relatively low-cost feed stocks of ligno-cellulosics, such as wood chips to increase the economic viability of producing biofuels and bioplastics. This will be accomplished by developing well-characterized cultures of bacteria that can carry out the industrially important specific enzymatic reactions. Host: Dr. Jodie Dexter

Noon Lunch, Cafeteria, Princess Street Campus, Red River College

12:45 p.m. Keynote – Use of Serious Games in Education, Dr. Reyn Redekopp, Faculty of Education, University of Manitoba

The use of serious games and simulations as teaching tools has gained a lot of interest, especially since the development of sophisticated yet inexpensive software tools have made the creation of serious games as teaching tools realizable. Dr. Redekopp will review the theory and practice of using video game and simulation formats. The use of this software to teach complicated biology and biotechnology concepts has great promise.

Dr. Reynold Redekopp is from the Faculty of Education at the University of Manitoba. He has been a leader in Manitoba in terms of helping to develop the skill sets of students and teachers with the use of technology – in particular in his role with ManACE (Manitoba Association for Computer Educators). For the past three years, he has been the coordinator of the MindSet “Girls in Gaming” Program to increase the female voice in the development and creation of video games. His passion is to find better ways to use technology to improve education.

1:15 p.m. Slot 1 Sessions

Video Game Lab

As a follow up to the keynote sessions, teachers can try out several games for use in their classes. University students, alumni of the Sanofi-Aventis BioTalent Challenge, have been trained to use these games and will be on hand to help teachers preview the games as quickly and efficiently as possible. They will be available to help you get right into the meaningful part of the game and to insure your time is well-spent versus being frustrated trying to learn how to use the software. Some of the games to be available are:

Genomics Digital Lab

Genomics Digital Lab (GDL), www.genomicsdigitallab.com/gdl/default.cfm, is an award winning, integrated 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. To meet the needs of students, teachers, and schools, GDL is designed to be fully online, accessible through a web browser, with no downloads, or installation, accessible from home or school.

Immune Attack

Immune Attack (<http://www.fas.org/immuneattack/>) is a new generation video game that engages students and teaches complex biology and immunology topics in a manner different from the traditional classroom approach. The goal is to immerse the student in immunology concepts to make learning fun and exciting.

Buffet Busters

This educational program, in a video game format, is an introduction to public health, infectious disease and epidemiology. Students work through four animated outbreak scenarios in a school, using scientific analysis and problem-solving in an interactive format available as a CD or online at www.buffetbusters.ca.

Inner Life of the Cell

While this multimedia presentation is not strictly a game, it is a simulation that uses the same development software used to develop games. This award representation of the inner workings can be found at http://multimedia.mcb.harvard.edu/anim_innerlife.html

Spore

The video game Spore, <http://www.spore.com/trial> allows players to create a tiny organism and help it evolve into an entire civilization, transforming the concept of evolution to a playable adventure in an online virtual universe. Players start in a Pac-man type environment, avoiding predators and searching for food. Players upgrade their creature by eating "DNA," earning enough points to crawl out of the primordial soup. They can then use the creature creator to physically shape their creature as it evolves in stages. In the later stages of the game, players create complex civilizations with unique buildings and vehicles.

Genomics in the Classroom, Doug Gajic, Educator, Centennial Collegiate Vocational Institute, Guelph, Ontario, Canada

This presentation will highlight the use of genomics in the classroom as an instrument to engage students in the biological Sciences. It will include specific resources for teachers to engage students with hands-on genomics activities in the biology classroom. An important aspect of the presentation will be the practical applications of the genomics paradigm by students in their lives. A complete resource list and sources will be provided to support educators' inclusion of genomics in the classroom.

Doug Gajic was the winner of the 2009 Ontario Genomics Teaching Prize after teaching biology and biotechnology for 16 years. Mr. Gajic's curriculum has students use up-to-date equipment to explore the relationship and impact of genomics and related fields to the biological sciences. Mr. Gajic exposes his students to current topics, techniques and tools in genomics including, for example, the Barcode of Life Data Systems (BOLD, a global resource funded in part by Ontario's Ministry of Research and Innovation and Genome Canada through OGI).

Agricultural Biotechnology in the Classroom, Dr. Murray Balance, Associate Dean Academic (Acting), Faculty of Agriculture and Food Sciences, and Sheri Pelletier, Educator, Vincent Massey Collegiate, Winnipeg, Manitoba

Manitoba is poised to be a major contributor to the innovation and development for the next 30 to 50 years in areas related to agricultural biotechnology in areas such as biofuels, biomaterials and "food as medicine." This session will highlight what is being done at the Faculty of Agriculture and Food Services and outline what opportunities there will be for students and teachers to learn more including the Agricultural Biotechnology Enrichment Program.

Microarrays in the Classroom, Paula Demacio, Professor, Centennial College, Toronto, Ontario

Bioinformatics is the convergence of computer science and biology and is one of the largest growing fields in biotechnology. Using Bioinformatics, the time it takes for the screening for genetic diseases or the development of new and powerful therapies has greatly decreased. One of the tools that is used is Microarrays. Microarrays are diagnostic tools used to screen for potential drug targets or genetic disease. In this session, the use of microarrays will be brought into the classroom using hands on tools that allow the students to experience this cutting edge technology.

Dr. Paula Demacio graduated with a Bachelors degree from Queen's University in 1996. She went on to study Duchenne Muscular Dystrophy at the University of Toronto and graduated with a Ph.D in Molecular and Molecular Genetics. She remained at the University of Toronto in Dr Peter Ray's laboratory and developed a model in mice to understand the genetic basis of Duchenne Muscular Dystrophy. Since 2003, Dr Demacio has taught at Centennial College where she is primarily responsible for teaching Biotechnology and Bioinformatics and currently divides her time between teaching and caring for two energetic sons at home!

2:00 p.m. Slot 2 Sessions

Video Game Lab

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Food, Chemistry and Biotechnology: Helping Students understand Relationships between Food Chemistry and Biotechnology. Dr. James K. Daun, Agrianalytical Consulting

This session summarizes a workshop that Dr. Daun has presented to educators across Manitoba to enhance their appreciation of the basic chemicals that make up the major nutritional food groups especially carbohydrates, proteins and lipids. Beginning, with a review of basic chemical structure and properties, the workshop describes the components involved in the basic food groups including sugars, amino acids and fatty acids and shows how these are used to build starch, proteins and fats. The workshop is largely hands-on with experiments to detect the presence of and activity of these substances.

Dr. Jim Daun, is an internationally recognized oilseeds researcher, recently retired from the Canadian Grain Commission. He has put together a number of hands on activities, most of which are doable in regular classrooms, using easy to acquire “ingredients.” Throughout his long and productive career, Jim has always donated his time and expertise to education and educators as a mentor, coach and presenter.

Skills for Careers in Biotechnology and Pharmaceutical industries. Said Hassan, Phillip Cheng, Pharmaceutical Manufacturing, Life Sciences, Red River College, Winnipeg, Manitoba

Biotechnology and pharmaceutical products are complex, requiring specific knowledge and skills for their development, manufacturing and testing. What are these skills? How are they related to general science? Where can they be acquired? The speakers in this session will address these questions and discuss how aspiring individuals can prepare themselves for successful careers in this high-tech and growing sector.

Said Hassan and Phillip Cheng teach the Pharmaceutical Manufacturing program at Red River College. The program covers different aspects of biopharmaceutical processing (manufacturing drugs using biotechnology), formulating drugs into dosage forms (tablets, capsules etc) and developing manufacturing processes. Graduates of the program are employed by pharma-biotech companies in Manitoba, involved in producing life saving products ranging from prescription drugs to nutritional supplements and vitamins.

2:45 p.m. Break

3:00 p.m. Slot 3 Sessions

Mobile Learning and the Biology Classroom, Rob Fisher, Manager, Learning Support and Technology Unit, Darren Kuropatwa, Senior Years ICT Consultant, Manitoba Education, Winnipeg

This session will be an introduction to how teachers can use cell phones, “smartphones” and game platforms to create teaching/learning experiences and materials. Educators will work with the presenters to brainstorm ideas of how the technology can be used in the classroom and in the “field.”

After successful careers as innovative educators, Rob and Darren are currently consultants for Manitoba Education, supporting the infusion of technology into all areas of the curriculum as members of the provincial Literacy with ICT team. Before coming to Manitoba Education, Rob was a curriculum consultant in the Mystery Lake School District in Thompson, Manitoba and Darren was a leading educator applying Web 2.0 tools to teaching, especially in the area of mathematics at Daniel McIntyre Collegiate Institute in the Winnipeg School Division.

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Microarrays in the Classroom, Paula Demacio, Professor, Centennial College, Toronto, Ontario

Bioinformatics is the convergence of computer science and biology and is one of the largest growing fields in biotechnology. Using Bioinformatics, the time it takes for the screening for genetic diseases or the development of new and powerful therapies has greatly decreased. One of the tools that is used is Microarrays. Microarrays are diagnostic tools used to screen for potential drug targets or genetic disease. In this session, the use of microarrays will be brought into the classroom using hands on tools that allow students to experience cutting edge technology.

Dr. Paula Demacio graduated with a Bachelors degree from Queen's University in 1996. She went on to study Duchenne Muscular Dystrophy at the University of Toronto and graduated with a Ph.D in Molecular and Molecular Genetics. She remained at the University of Toronto in Dr Peter Ray's laboratory and developed a model in mice to understand the genetic basis of Duchenne Muscular Dystrophy. Since 2003, Dr Demacio has taught at Centennial College where she is primarily responsible for teaching Biotechnology and Bioinformatics and currently divides her time between teaching and caring for two energetic sons at home!

3:45 p.m. Closing Remarks – John Murray, Science Consultant, Manitoba Education

John Murray is a science and mathematics educator with over 20 years experience. Since 2000, he has been a science curriculum specialist with Manitoba Education. He holds degrees in geology, astronomy, and science education and is currently a PhD candidate in the Faculty of Education and Centre for Earth Observation Sciences at the University of Manitoba. His interests revolve around linking complex Earth systems science to a broad education for sustainability of the planet, which he sees as among the most important elements in designing a transformative 21st century educational experience for Canadians.

- 6:00 p.m. Genome Prairie's "Dinner and a Movie," Cafeteria, Princess Street Campus, Red River College
- 6:45 p.m. Greetings – Carol Reynolds, Director of Communications and Government Relations, Genome Prairie
- 7:00 p.m. Cancer Warriors - A PBS Nova special on cancer researcher, Dr. Judah Folkman.
- The one hour program follows the extraordinary odyssey of surgeon-turned-researcher Dr. Folkman, who, together with colleagues at Children's Hospital in Boston, has spent over 30 years searching for ways to curb cancer by cutting off blood flow to tumors.
- 9:00 p.m. Closing Remarks - Lucy St. Lawrence, Science Consultant, Winnipeg School Division

Program, Thursday, February 18

- 8:00 a.m. Registration
- 8:30 a.m. Opening Remarks
- 8:35 a.m. Keynote - Feeding the World – The Role That Biotechnology Can Play, Dr Mary Alton Mackey, International Consultant in Food, Nutrition and Health

The World's population is expected to be 8 billion by 2025. Increased food production must come from increasing biological yields, not from area expansion and more irrigation, because land and water are becoming increasingly scarce. The promise of biotechnology lies in its capacity to improve the quality and quantity of crops swiftly and effectively. The application of biotechnology can create plants more resistant to drought, soil acidity and salination, that mature earlier, are easier to transport, have reduced post harvest losses and exhibit increased nutritional quality. Micronutrient malnutrition, or hidden hunger, affects millions of people worldwide every year. Without the essential nutrients needed for growth and development, children are more susceptible to infection, are slower to develop and can be left blind or stunted. The two most common approaches to combating micronutrient malnutrition are supplementation and fortification. Unlike the continual costs required for supplementation and fortification, a one-time investment in developing biofortified crops can result in new micronutrient-rich varieties that farmers can grow for years to come. For farmers the technology is in the seed.

Besides working at McGill and Memorial University, Dr Mary Alton Mackey has extensive experience in many African and Asian countries. She has been actively following the development of food biotechnology since 1993 and has participated in numerous leadership and training activities. She has been a frequent speaker on food biotechnology including presentations at World Congress International Federation of Home Economics held in Ghana West Africa and the Dieticians' of Canada Conference on Biotechnology and Heart Health. She has served on many national and international committees and currently is Acting Vice Chair and Chair of the Audit Committee for the Board of Directors of Africa Harvest Biotech Foundation International.

- 9:05 a.m. Greetings, Dr. Gerald Farthing, Deputy Minister, Manitoba Education, Province of Manitoba

Gerald Farthing started working for the Manitoba Government in 1984 and joined the Department of Education in 1988. Gerald has been the Deputy Minister of the Department of Education since July 2004. Prior to this he was the Assistant Deputy Minister, School Programs Division, and prior to that the Director of the Schools' Finance Branch. He is also the Chair of the Public Schools Finance Board which is responsible for overseeing and administering the provincial school building capital program. Gerald has a Ph.D. in public policy and government from the London School of Economics and Political Science.

Gerald is an advocate for the development and promotion of Education for Sustainable Development in Canada. Manitoba is the lead jurisdiction in the Council of Ministers of Education, Canada's (CMEC) international work on ESD and represents CMEC on the United Nations Economic Commission for Europe ESD Steering Committee.

9:15 a.m. Leave for Tours

9:30 a.m. Tours

Participants choose one of the four tours to the health science sites.

Tour 1 – Youth Biomedical Laboratory, Niji Mahkawa School

While the Youth Biomedical Laboratory was created to have a place where youth in the inner city could learn about careers in the health field, it now has some of the most advanced biotechnology equipment in the province. Teachers can bring their students here and students can participate in summer learning activities using the state-of-the-art equipment. Host: Leon Espira

Tour 2 – Institute of Biodiagnostics, National Research Council

The National Research Council Institute of Biodiagnostics is making a very real difference to people's health by developing non-invasive medical devices and technologies for early and accurate diagnosis of conditions like cancer, stroke and cardiovascular disease. Research Projects are developing tools which include magnetic resonance, infrared, optical, and fluorescence techniques. Host: Valerie MacPherson

Tour 3 – Breast Cancer Group, Department of Biochemistry and Medical Genetics, University of Manitoba

As researchers in the Breast Cancer Group, Dr. Etienne Leygue and his group at the University of Manitoba focus on the study of gene expression during the development of tumours in human breast cancer. The knowledge of these changes will provide direction to develop new preventive and curative strategies. Dr. Etienne Leygue

Tour 4 – Genomic Centre for Cancer Research and Diagnosis

The Genomic Centre for Cancer Research and Diagnosis (GCCRD) was created as a regional and national facility for all cutting edge imaging applications. The GCCRD is affiliated with the Manitoba Institute of Cell Biology (MICB), CancerCare Manitoba and the University of Manitoba. Activities of the GCCRD include projects in molecular biology, cell biology, histopathology, and genetic diseases. The goals of the GCCRD are basic and translational research, as well as the education of students and highly qualified personnel in genomic instability, cancer genetics and imaging. Host: Dr. Rhea Vallente

10:45 a.m. Slot 4 Sessions

OneNote – Organizing Life Science Information and Projects, Paula Norman, Lana Sagert and Cam Mateika, Swan Valley Regional Secondary School, Swan River, Manitoba

OneNote is a Microsoft software application which facilitates the organization and creation of information products such as essays, experiments or electronic portfolios. OneNote provides a platform to integrate text, images, audio, sound, video and Internet resources into one organizational or presentation package. OneNote is available free-of-charge in many provinces, including Manitoba, as part of the agreement between Microsoft and provincial or state jurisdictions.

Careers, Knowledge and Skills in the Biotechnology Sector, Norman Lee, Coordinator, Mindset, The Manitoba Network for Science and Technology, Winnipeg, Manitoba, Canada

Manitoba, and Canada as well, needs to attract as many young people as possible to careers in science and especially in bioscience, biotechnology and life science. Educators and students need to be more aware of the outstanding career opportunities for young people in these fields of science and technology.

Before becoming the creator and coordinator of MindSet, Norm was an educator for 28 years, receiving 2 international and 16 national awards for excellence and innovation. He left the public school system to work at Industry Canada's SchoolNet where he created four national science and technology awareness programs. MindSet received the 2008 Global Award for Creating the Workforce of the Future from the International Partnership Network.

Dreaded Red: Simulation of an Epidemic, Joyce McCallum, Educator, Morden Collegiate, Morden, Manitoba

Dreaded Red was developed by the National Biotechnology Laboratory as part of its outreach program, based on the SARS outbreak. Participants assume roles such as the index patient, family medical doctor, NML, World Health Organization and the media. This scenario-based for demystifying an outbreak response can be carried out in one of more class periods. This session will be an actual working through the simulation.

Joyce McCallum has been working with the Dreaded Red materials in her classroom for five years. She has presented this workshop on how she does the simulation at conferences national and provincial conferences.

Life Science and Bioethics, Dr. Alison Symington, Executive Director of Bioscience Education Canada, Toronto, Ontario

While biotechnology and life science hold great promise for the amelioration of human suffering in a number of areas, these improvements in the quality of life may be wrought with a number of philosophical and ethical issues. Examples of this are already apparent in the issues related to stem cells, cloning, genetically modified organisms and the use of food stocks for biofuels.

Alison Symington is currently the Executive Director of Bioscience Education Canada. Previously, she was a professor and program coordinator at Seneca College's School of Biological Sciences and Applied Chemistry from 1998-2008. Dr. Symington has worked as an associate of Bioscience Education Canada on such projects as the Sanofi-Aventis BioTalent Challenge, the York Biotech Toolbox and several laboratory courses for high school teachers. Prior to that, Dr. Symington was a development scientist at sanofi pasteur.

11:30 a.m. Slot 5 Sessions

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12:15 Lunch

12:45 p.m. Keynote – Life Science in Space, Dr. Nicole Buckley, Director, Physical and Life Science, Canadian Space Agency

Canada is very involved with life science research in space. Dr. Buckley will describe what Canada has been doing as well as outlining some of the student projects that have been supported by the Canadian Space Agency.

Nicole Buckley joined the Canadian Space Agency in January 2002 as Program Scientist for Space Life Sciences. She was the CSA's scientific research coordinator for two Canadian projects flown on space shuttle missions, including Columbia's tragic STS-107 mission in 2003. She has a PhD from the University of Manitoba and has been a popular speaker with the scientific community and students in Manitoba.

1:15 p.m. Teacher Round Tables

Educators who have developed their own biotechnology lessons will be on-hand to share their work. There will be three, 20 minute sessions presenting with 10 topics per session. These lessons have been developed for and in the classroom. Teachers who have indicated they will share their work include:

Biotechnology in the Elementary School, Michelle Lee, Angus McKay School, Winnipeg, Manitoba

Harvesting Algae to Produce Biofuels, Richard Korman – Killarney School, Killarney, Manitoba

Forensics Teaching Unit, Paula Norman, Swan Valley Regional Secondary School, Swan River, Manitoba

Student and Teacher Learning Opportunities, Bob Brown, Scientific Advisor, MindSet, The Manitoba Network for Science and Technology

Using “The Score” – A movie about genetics and bioethics -in the Classroom, Norman Lee,
Coordinator, MindSet, The Manitoba Network for Science and Technology

Please let us know if you have a bioscience teaching unit you would like to share.

2:15 p.m. Teacher Interest Groups

Time has been set aside for educators to meet others with similar interests who want to continue sharing ideas, knowledge and programs. Among the groups will be the following: Elementary Teachers, Middle Years Teachers, Agricultural Biotechnology, Biomaterials and Biocomposites, BioFuels, Functional Foods and Nutraceuticals.

2:45 p.m. Closing Remarks, Dr. Alison Symington, Executive Director, Bioscience Education
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