SABC 2007 Student Research Projects

The following 34 student research projects have been approved by the expert Evaluation Committee for the 2007 competition, subject to certain conditions such as obtaining support from an appropriate mentor.

The antiviral effects of resveratrol on envelop viruses (HIV) that infect CD4+ T Cells
Francis Libermann Catholic High School

Enabling composting by *E.coli* bacteria in cold weather with use of anti-freeze proteins
University of Toronto Schools

The effects of exposing bacteria to environmental stresses on bioremediation
Havergal College

Gene expression changes mediating a-synuclein toxicity in a Drosophila model of Parkinson's disease
Appleby College

Cellular and molecular mechanisms of ethanol-induced neurodevelopmental toxicity
Thornhill Secondary School

Mechanism of systemic ghrelin secretion
Marshall McLuhan Catholic Secondary School

Million Dollar Garbage
Father Michael McGivney Catholic Academy

A study of aortic valve calcification: the effects of CNP and PTHrP on valve interstitial cells
Saint Elizabeth Catholic High School

The creation of a next generation antibiotic through research with quorum sensing in gram-negative bacteria
St. Theresa of Lisieux Catholic High School

Immune System of Plants
Northern Secondary School

Synthesis of PHB with recombinant *E. coli*
Ontario Science Centre School

The effects of chinese herbal tea on the rate of regeneration in planaria
Albert Campbell Collegiate Institute

Effects of caffeine on fruit flies
Albert Campbell Collegiate Institute

Effects of cyclooxygenase 2 (COX-2) inhibitors on lymphangiogenesis and angiogenesis
Saint Elizabeth Catholic High School

Glowing Kidneys: Optimizing the insertion of the GFP gene into embryonic mice kidneys
Northern Secondary School

The synergistic effects of HDAC inhibitors and vitamin D as a breast cancer preventative
St. Augustine Catholic High School

Identification and characterization of novel heat stress genes in Arabidopsis using bioinformatics and reverse genetics
Georges Vanier Secondary School

Tea Tree Oil : A safe and effective alternative to a dangerous and commonly used antibacterial?
University of Toronto Schools

Effective RNA interference in *Drosophila melanogaster*
Albert Campbell Collegiate Institute

Electricity inducing apoptosis in cancer cells
St. Augustine Catholic High School

The use of lavender oil as a treatment for inflammation in rheumatoid arthritis
St. Augustine Catholic High School

Antibacterial properties of herbal remedies: Bacteria-killing foods, good for you, bad for them
Northern Secondary School

Luminescent *Agrostis palustris*
The Woodlands School

Biological based detergent
Georges Vanier Secondary School

The prevention of the common potato scab
The Woodlands School

Impact of herb extracts on B-amyloid plaque reduction in Alzheimer's Disease
University of Toronto Schools

Atheroma (plaque) degeneration
Earl Haig Secondary School

Using bacteriocins as an alternative for antibiotics to eliminate antibiotic resistance
Northern Secondary School

The effects of the G-90 extract of the Eisenia foetida earthworm on damaged mouse embryo fibroblasts
Saint Elizabeth Catholic High School

Challenging Mother Nature: Accelerating the rate of plant cell growth
Albert Campbell Collegiate Institute

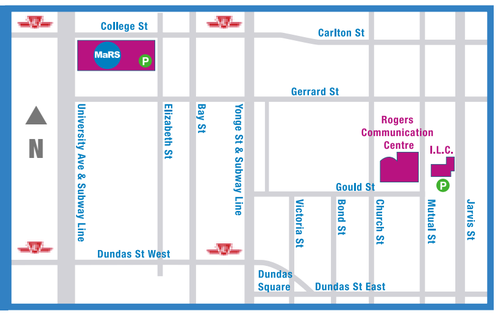
Caffeine, mediated by p53, Bax and caspase 3, on induction of apoptosis
Francis Libermann Catholic High School

Reactivating telomerase in vegetative plant tissues
The Woodlands School

Understanding effects of light energy on retinal in eyes by analysis of rhodopsin in halobacterium
Francis Libermann Catholic High School

The antioxidant effect of pomegranate juice on Alzheimer's disease
St. Augustine Catholic High School

This year's exhibition is at the **Rogers Communication Centre, Ryerson University,** 80 Gould St., May 1-2, 2007 and the awards are at the **MaRS Centre**, 101 College Street, May 3, 2007



REGISTRATION DEADLINE: APRIL 14, 2007
(SPACE IS LIMITED)

➲ **PHOTOCOPY AND FAX** *your completed form below to:*

CBERC: 416 673-8471

Your reply and confirmation will be emailed to you.

FOR FURTHER INFORMATION: **416-673-8471** *or:* **www.biotechchallenge.ca** Greater Toronto Section

APPLICATION

for tbi THE BIOTECHNOLOGY INITIATIVE Lecture Series and MERCK FROSST Discovering today for a better tomorrow. Exploring Minds

Grades 9 - 12

NOW AT

Rogers Communication Centre

RYERSON UNIVERSITY

May 1-2, 2007

School Phone Number *(Please print in ink)* ( ) *Area Code* *Main Office Number*

School Fax Number ( ) *Area Code* *Main Office Number*

School Name

School Address

City Province Postal Code

Contact Name

Contact Email *(Mandatory)*

No. of Students No. of Supervisors *(including teacher)* Grade Level(s)

CHOICE OF **DATE** FOR VISIT *(Please circle day in ink)*

First Choice: **May : 1 2 2007**

Second Choice: **May : 1 2 2007**

All lectures and workshops are **FREE!**

Limit of: 2 Lectures 1 Workshop per class

NOTE:
- Food facilities are limited.
- When booking lectures and workshops plan lunch time for your students
- It is recommended that STUDENTS BRING THEIR OWN BOX LUNCH.

CHOICE OF **L**ECTURES *(Please print in ink)*

① ② ③ ④

CHOICE OF **W**ORKSHOPS *(Please print in ink)*

① ② ③

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OUR SUPPORTERS

SABC NATIONAL SUPPORTERS 2007

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BioTalent Canada

Government of Canada's Sector Council Program

Genome Canada

National Research Council

Canadian Institute of Health Research

National Research Council

Canadian Louis Pasteur Foundation

VWR International

Canadian Foundation for Innovation

SABC TORONTO REGIONAL SUPPORTERS 2007

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Merck Frosst

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University of Toronto

Seneca College of Applied Arts and Technology

York University

Toronto District School Board

City of Toronto

SHI Consulting

MaRS

Concept and Design: **UnCommon Solutions.** *Toronto*

Biotech Alive! *is the official newsletter of the Sanofi-Aventis Biotech Challenge, an annual public education program sponsored by Sanofi Pasteur Limited, The Biotechnology Initiative, Merck Frosst and the biotechnology and education communities in the greater Toronto region.*

The Sanofi-Aventis Biotech Challenge program and the companion lecture and workshop series are co-ordinated by the Canadian Biotechnology Education Resource Centre (CBERC).

Canadian Biotechnology Education Resource Centre

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Biotech Alive!

SPRING 2007

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Can you learn about the biochemical mechanism of Parkinson's disease in fruit flies by tracking the changes in gene activity during the progressive degeneration?

May 1-3, 2007

Now at

RYERSON UNIVERSITY

That's the question being researched by one student involved in this year's Sanofi-Aventis Biotech Challenge here in the Toronto region.

The SABC continues to offer an opportunity for curious and creative students to research their ideas under the guidance of experienced researchers. In the Toronto area this year there were a record 73 proposal submissions, from 28 different schools, 10 of them new to the competition. After the proposal review process and subsequent revisions by the applicants, 34 proposals were accepted to proceed to the next stage.

The diverse topics covered by the 34 proposals, reflect the importance of biotechnology in human activities. Topics covered include: drug discovery, therapeutics, bioremediation, disease mechanisms, bioprocessing, nutrition and brain development, the environment, and biofuels. The wide range of topics approached also suggests that students are indeed, generating a lot of these ideas themselves. That they can move forward with their creative ideas is due to the size and diversity of the research community in the Toronto area and the willingness of researchers to lend their time, resources and expertise.

Some of the other investigations involve:
- The development of microbial fuel cells able to produce electrical energy from the decomposition products of organic waste.
- Using recombinant DNA technology to create bacteria that manufacture the building blocks for biodegradeable plastic.

The Toronto student teams will compete for $12,000 in cash prizes and scholarships at the **Rogers Communication Centre, Ryerson University** on May 1-2 and the awards ceremony will be held at the **MaRS Centre** on May 3rd. The national competition will be held via video conference from the National Research Council in Ottawa on May 10, 2007. The results of the National competition can be viewed live via web cast on May 11, 2007 at: **www.biotechchallenge.ca.**

Once again, the **Explore Biotechnology lectures** and **Exploring Minds workshops** will be available to the public free of charge, held concurrently with the SABC competition on May 1-2, 2007 through the continued sponsorship of The Biotechnology Initiative and Merck Frosst.

L Lectures proudly sponsored by tbi THE BIOTECHNOLOGY INITIATIVE

BioTalent Canada Building skills for Canada's bio-economy

W Workshops proudly sponsored by MERCK FROSST Discovering today for a better tomorrow.

All lectures and workshops are **FREE!**

L LECTURES
DURATION: 45 minutes (each program)
CAPACITY: 250 students per program

W WORKSHOPS
DURATION: 45 minutes (each program)
CAPACITY: 96 students per program

tbi THE BIOTECHNOLOGY INITIATIVE

All lectures and workshops are confirmed at the time of printing.
We reserve the right, however, to alter the program, as required, without notice.

L LECTURE SERIES

Limit of:
2 Lectures
1 Workshop
per class

GRADES 9 - 12

BIOTECHNOLOGY: EXPLORE THE POSSIBILITIES
Dr. Alison Symington, Seneca College
Marvel at the impact biotechnology has on our lives! Investigate the many uses of genetic engineering in health care and discover how it is revolutionizing the development of vaccines in the fight against disease.
- *Technologies in Everyday Life (Gr. 11)*
- *Diversity of Living Things (Gr. 11)*
- *Science and Contemporary Societal Issues (Gr. 12)*
- *Molecular Genetics (Gr. 12)*

NUNS AND RABBITS
Peter Fields, Merck Frosst, Vaccines Division
Learn the story behind the discovery of a cancer vaccine. Discover how scientists used information about nuns, horned-rabbits and warts to discover a vaccine that can now be provided to women to protect them against cervical cancer.
- *Reproduction (Gr. 9)*
- *Technologies in Everyday Life (Gr. 11)*
- *Science and Contemporary Societal Issues (Gr. 12)*
- *Molecular Genetics (Gr. 12)*

CRIME SCIENCE
Centre of Forensic Sciences
Discover the latest advances in the field of crime fighting! Join a forensic scientist to investigate how DNA analysis and body-fluid identification methods are used to solve real criminal cases.
- *Genetic Continuity (Gr. 11)*
- *Technologies in Everyday Life (Gr. 11)*
- *Diversity of Living Things (Gr. 11)*
- *Science and Contemporary Societal Issues (Gr. 12)*
- *Molecular Genetics (Gr. 12)*
- *Evolution (Gr. 12)*

BIODIVERSITY IDENTIFICATION WITH DNA BARCODES
Dr. Robert Hanner, Biodiversity Institute of Ontario, University of Guelph
A grand challenge for biology is to produce an inventory ofall species on Earth and after 250 years of trying, we stilllack even a reasonably complete checklist. Meanwhile, the ability to identify most species of known organisms requiresspecial expertise and even then is usually only applicable to in tact adult specimens. Modern biotechnology is being harnessed to aid this endeavor and will extend species recognition to forensic applications.
- *Technologies in Everyday Life (Gr. 11)*
- *Diversity of Living Things (Gr. 11)*
- *Genetic Continuity (Gr. 11)*
- *Science and Contemporary Societal Issues (Gr. 12)*
- *Molecular Genetics (Gr. 12)*
- *Evolution (Gr. 12)*

HUNTING THE 1918 FLU
Dr. Kirsty Duncan, University of Toronto
Dr. Duncan led the expedition to discover the causal agent of the 1918 Spanish influenza virus. 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.
- *Technologies in Everyday Life (Gr. 11)*
- *Science and Contemporary Societal Issues (Gr. 12)*
- *Molecular Genetics (Gr. 12)*

PROTEIN BIO MARKERS AND RECEPTOR ASSOCIATED DRUG TARGETS
Dr. John Marshall, Ryerson University
Learn how the early identification of specific proteins called "biomarkers" might allow the diagnosis of disease years before symptoms appear permitting early treatment.
- *Technologies in Everyday Life (Gr. 11)*
- *Science and Contemporary Societal Issues (Gr. 12)*
- *Molecular Genetics (Gr. 12)*

IDENTIFICATION AND ANALYSIS OF GENES AND PROTEINS INVOLVED IN NERVOUS SYSTEM DEVELOPMENT IN THE NEMATODE C. ELEGANS
Dr. Marie Killeen, Ryerson University
Learn how research is leading to an understanding of how nerve cells make the right connections in C. elegans a microscopic, non-parasitic worm with a simple nervous system.
- *Technologies in Everyday Life (Gr. 11)*
- *Genetic Continuity (Gr. 11)*
- *Molecular Genetics (Gr. 12)*
- *Evolution (Gr. 12)*

MICROBIAL DIVERSITY
Dr. Gideon Wolfaardt, Ryerson University
Learn how the knowledge of microbes and the extracellular polymeric substances that they produce can be applied in areas such as wastewater treatment, microbial conversion of biomass.
- *Diversity of Living Things (Gr. 11)*
- *Genetic Continuity (Gr. 11)*
- *Molecular Genetics (Gr. 12)*
- *Evolution (Gr. 12)*
- *Technologies in Everyday Life (Gr. 11)*

MERCK FROSST
Discovering today for a better tomorrow.

Exploring Minds

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W WORKSHOPS

A MICROBIAL MYSTERY
Faculty, Department of Biological Sciences, Seneca College
An outbreak occurs! A bacterial contaminant is suspected! How do microbiologists determine the identity of the microscopic culprit? Be a microbial sleuth and track down the world's smallest living organisms. In this hands-on workshop students will use modern microbiological laboratory techniques to identify unknown, non-pathogenic bacteria.

EXTRACTING DNA: HOW TO DO IT AT HOME
Faculty, Department of Biological Sciences, Seneca College
Have you ever wondered what DNA looks like? In this workshop you will isolate DNA using household materials and equipment.
- *Molecular Genetics (Gr. 12)*

CSI AND CELLS:
Faculty, Department of Biological Sciences, Seneca College
Students enrolled in this workshop will be engaged in a Crime Scene Investigation and under the pressure of time, be encouraged to solve a mysterious murder using DNA identification.
- *Cellular Forms (Gr. 11)*
- *Cellular Biology (Gr. 11)*
- *Microbiology (Gr. 11)*

Seneca
Seneca College of Applied Arts & Technology

TUESDAY, MAY 1

10:00am	L	Biotechnology: Explore the Possibilities
	W	A Microbial Mystery
11:00am	L	Protein Bio Markers and Receptor Associated Drug Targets
	W	Extracting DNA: How To Do It At Home
noon	L	Molecular Biology Of Neurogenesis
1:00pm	L	Biodiversity Identification With DNA Barcodes
	W	CSI and Cells

WEDNESDAY, MAY 2

10:00am	L	Microbial Diversity: Foundation for Exploration and Biotechnological Application
	W	A Microbial Mystery
11:00am	L	Nuns and Rabbits
	W	Extracting DNA: How To Do It At Home
noon	L	Hunting the 1918 Flu
1:00pm	L	Crime Science
	W	CSI and Cells

2007 SANOFI-AVENTIS BIOTECH CHALLENGE