

**THE UNIVERSITY OF WESTERN ONTARIO  
BIOLOGICAL AGENTS REGISTRY FORM**  
Approved Biohazards Subcommittee: July 9, 2010  
Biosafety Website: [www.uwo.ca/humanresources/biosafety/](http://www.uwo.ca/humanresources/biosafety/)

This form must be completed by each Principal Investigator holding a grant administered by the University of Western Ontario (UWO) or in charge of a laboratory/facility where the use of Level 1, 2 or 3 biological agents is described in the laboratory or animal work proposed. The form must also be completed if any work is proposed involving animals carrying zoonotic agents infectious to humans or involving plants, fungi, or insects that require Public Health Agency of Canada (PHAC) or Canadian Food Inspection Agency (CFIA) permits.

This form must be updated at least every 3 years or when there are changes to the biological agents being used.

Containment Levels will be established in accordance with Laboratory Biosafety Guidelines, 3rd edition, 2004, Public Health Agency of Canada (PHAC) or Containment Standards for Veterinary Facilities, 1<sup>st</sup> edition 1996, Canadian Food Inspection Agency (CFIA).

Completed forms are to be returned to Occupational Health and Safety, (OHS), (Support Services Building, Room 4190) for distribution to the Biohazards Subcommittee. For questions regarding this form, please contact the Biosafety Officer at extension 81135 or [biosafety@uwo.ca](mailto:biosafety@uwo.ca). If there are changes to the information on this form (excluding grant title and funding agencies), contact Occupational Health and Safety for a modification form. See website: [www.uwo.ca/humanresources/biosafety/](http://www.uwo.ca/humanresources/biosafety/)

PRINCIPAL INVESTIGATOR	<u>Dr. Gregor Reid</u>
DEPARTMENT	<u>Microbiology and Immunology</u>
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PHONE NUMBER	<u>(519) 646-6000 x65256</u>
EMERGENCY PHONE NUMBER(S)	<u>N/A</u>
EMAIL	<u>gregor@uwo.ca</u>

Location of experimental work to be carried out: Building(s) Lawson Health Research Institute Room(s) F3-127

\*For work being performed at Institutions affiliated with the University of Western Ontario, the Safety Officer for the Institution where experiments will take place must sign the form prior to its being sent to the University of Western Ontario Biosafety Officer (See Section 15.0, Approvals).

FUNDING AGENCY/AGENCIES: Kimberly Clark, Dairy Farmers of Canada, NSERC, Danone  
GRANT TITLE(S):

Reid, G., and J. McCormick. 2009-10. Kimberly Clark, \$280,000, studies on biomaterials.  
Reid, G. 2009-11. Dairy Farmers of Canada and NSERC, Genomics of lactobacilli for dairy applications, \$85,000.  
Reid, G. 2010-11. NSERC Discovery, \$27,000, Deciphering Lactobacillus functionality.  
Reid, G. 2010-11 Danone, \$120,000, Detoxication study.

List all personnel working under Principal Investigators supervision in this location:

<u>Name</u>	<u>UWO E-mail Address</u>	<u>Date of Biosafety Training</u>
<u>Marc Monachese</u>	<u>mmonach@uwo.ca</u>	<u>Dec 8 2009</u>
<u>Roderick MacPhee</u>	<u>rmaphee@uwo.ca</u>	<u>Dec 8 2009</u>
<u>Jordan Bisanz</u>	<u>jbisanz@uwo.ca</u>	<u>Oct 15 2009</u>
<u>Wayne Miller</u>	<u>wmiller5@uwo.ca</u>	<u>Jan 19, 2010</u>
<u>Amy McMillan</u>	<u>amcmil2@uwo.ca</u>	<u>Sep. 15, 2010</u>
<u>Shannon Mifflin</u>	<u>N/A (shannon.mifflin@sjhc.london.on.ca)</u>	<u>Aug. 6, 2010</u>

**Please explain the biological agents and/or biohazardous substances used and how they will be stored, used and disposed of. Projects without this description will not be reviewed.**

In regards to biological agents, our lab primarily works with nonpathogenic strains of bacteria from the genera *Lactobacilli* and *Bifidobacterium*. We also work with the urogenital pathogenic bacteria *Atopobium vaginae* and *Gardnerella vaginalis*. Additionally, we work with the VK2 (vaginal epithelial cells) and CaCo-2 (intestinal epithelial cells) cell lines. Stocks of the bacteria are stored in 1.5 ml cryotubes in boxes in a -80° C freezer. Stocks of the cell lines are stored in cryotubes in boxes in a deep freezer containing liquid nitrogen. When working with these bacteria and cells, proper safety precautions will be used, including the use of gloves, lap coats, and aseptic technique. Agar plates and other solid waste that has come in contact with biological agents will be disposed of in the appropriate biological waste bins. Liquid waste will be bleached, and then disposed of based on the type of solution present (growth media will be dumped down the drain, liquids containing hazardous chemicals will be labeled and sent for chemical waste pickup, where they will be disposed of safely).

Please include a one page research summary or teaching protocol.

Our research is aimed at using beneficial microbes to improve health. Primarily, we focus on the microbiota of the vagina and how it changes between health and bacterial vaginosis. This involves genomic studies of the organisms using bioinformatics and pyrosequencing. The mechanistic studies involve human epithelial cells, cell lines, blood cells, and microscopy. Most of the organisms we use are food-grade non-pathogens, and of the pathogens, non are highly infectious.

**1.0 Microorganisms**

1.1 Does your work involve the use of biological agents?  YES  NO  
(non-pathogenic and pathogenic biological agents including but not limited to bacteria and other microorganisms, viruses, prions, parasites or pathogens of plant or animal origin)? If no, please proceed to Section 2.0

Do you use microorganisms that require a permit from the CFIA?  YES  NO

If YES, please give the name of the species. \_\_\_\_\_

What is the origin of the microorganism(s)? \_\_\_\_\_

Please describe the risk (if any) of escape and how this will be mitigated:

\_\_\_\_\_  
\_\_\_\_\_

Please attach the CFIA permit.

Please describe any CFIA permit conditions:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1.2 Please complete the table below:

Name of Biological agent(s)*	Is it known to be a human pathogen? YES/NO	Is it known to be an animal pathogen? YES/NO	Is it known to be a zoonotic agent? YES/NO	Maximum quantity to be cultured at one time? (in Litres)	Source/ Supplier	PHAC or CFIA Containment Level
<i>Lactobacillus</i> spp.	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	<input checked="" type="checkbox"/> 1 2 2+ 3
** <i>Bifidobacterium</i> spp.	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	<input checked="" type="checkbox"/> 1 2 2+ 3
** <i>Atopobium vaginae</i>	<input checked="" type="checkbox"/> Yes No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	1 <input checked="" type="checkbox"/> 2 2+ 3
** <i>Gardnerella vaginalis</i>	<input checked="" type="checkbox"/> Yes No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	1 <input checked="" type="checkbox"/> 2 2+ 3
** <i>Enterococcus faecalis</i>	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	<input checked="" type="checkbox"/> 1 2 2+ 3
** <i>Enterococcus faecium</i>	<input checked="" type="checkbox"/> Yes No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	1 <input checked="" type="checkbox"/> 2 2+ 3
** <i>Prevotella melaninogenica</i>	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	Yes <input checked="" type="checkbox"/> No	0.1 L	Human	<input checked="" type="checkbox"/> 1 2 2+ 3

\*Please attach a Material Safety Data Sheet or equivalent from the supplier.

\*\*MSDS NOT available

## 2.0 Cell Culture

2.1 Does your work involve the use of cell cultures?

YES

NO

If no, please proceed to Section 3.0

2.2 Please indicate the type of primary cells (i.e. derived from fresh tissue) that will be grown in culture:

Cell Type	Is this cell type used in your work?	Source of Primary Cell Culture Tissue	AUS Protocol Number
Human	Yes <input checked="" type="checkbox"/> No		Not applicable
Rodent	Yes <input checked="" type="checkbox"/> No		
Non-human primate	Yes <input checked="" type="checkbox"/> No		
Other (specify)	Yes <input checked="" type="checkbox"/> No		

2.3 Please indicate the type of established cells that will be grown in culture in:

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Supplier / Source
Human	<input checked="" type="checkbox"/> Yes No	VK2 (vaginal epithelial), CaCo-2 (epithelial)	ATCC
Rodent	Yes <input checked="" type="checkbox"/> No		
Non-human primate	Yes <input checked="" type="checkbox"/> No		
Other (specify)	Yes <input checked="" type="checkbox"/> No		

\*Please attach a Material Safety Data Sheet or equivalent from the supplier. (For more information, see [www.atcc.org](http://www.atcc.org))

2.4 For above named cell types(s) indicate PHAC or CFIA containment level required 1  2  2+  3

### 3.0 Use of Human Source Materials

3.1 Does your work involve the use of human source materials?  YES  NO

If no, please proceed to Section 4.0

3.2 Indicate in the table below the Human Source Material to be used.

Human Source Material	Source/Supplier /Company Name	Is Human Source Material Infected With An Infectious Agent? YES/NO	Name of Infectious Agent (If applicable)	PHAC or CFIA Containment Level (Select one)
Human Blood (whole) or other Body Fluid	Patient	Yes <input checked="" type="radio"/> Unknown	N/A	<input type="radio"/> 1 <input checked="" type="radio"/> 2 2+ <input type="radio"/> 3
Human Blood (fraction) or other Body Fluid		Yes Unknown		<input type="radio"/> 1 <input type="radio"/> 2 2+ <input type="radio"/> 3
Human Organs or Tissues (unpreserved)		Yes Unknown		<input type="radio"/> 1 <input type="radio"/> 2 2+ <input type="radio"/> 3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

### 4.0 Genetically Modified Organisms and Cell lines

4.1 Will genetic modifications be made to the microorganisms, biological agents, or cells described in Sections 1.0 and 2.0?  YES  NO If no, please proceed to Section 5.0

4.2 Will genetic modification(s) involving plasmids be done?  YES, complete table below  NO

Bacteria Used for Cloning *	Plasmid(s) **	Source of Plasmid	Gene Transfected	Describe the change that results from transformation or tranfection
<i>E. coli</i> DH5alpha <i>Lactobacillus</i> spp.	pTRK785	T. Klaenhammer	LINAB10564	Unknown
<i>E. coli</i> DH5alpha <i>Lactobacillus</i> spp.	pLi50 pG+Host5 pBlueScript II	J. McCormick	Peg 1499 Peg 1498-1505 Peg 918-924	Unknown

\* Please attach a Material Data Sheet or equivalent if available.

\*\* Please attach a plasmid map.

4.3 Will genetic modification(s) involving viral vectors be made? YES, complete table below  NO

Virus Used for Vector Construction	Vector(s) *	Source of Vector	Gene(s) Transduced	Describe the change that results from transduction

\* Please attach a Material Safety Data Sheet or equivalent.

4.4 Will genetic sequences from the following be involved?

- ◆ HIV YES, please specify \_\_\_\_\_ NO
- ◆ HTLV 1 or 2 or genes from any Level 1 or Level 2 pathogens  YES, specify \_\_\_\_\_ NO
- ◆ SV 40 Large T antigen YES NO
- ◆ E1A oncogene YES NO
- ◆ Known oncogenes YES, please specify \_\_\_\_\_ NO

◆ Other human or animal pathogen and or their toxins YES, please specify \_\_\_\_\_ NO

4.5 Will virus be replication defective? YES NO

4.6 Will virus be infectious to humans or animals? YES NO

4.7 Will this be expected to increase the containment level required? YES NO

**5.0 Human Gene Therapy Trials**

5.1 Will human clinical trials be conducted involving a biological agent? YES ⊗ NO  
(including but not limited to microorganisms, viruses, prions, parasites or pathogens of plant or animal origin)  
If no, please proceed to Section 6.0

5.2 If YES, please specify which biological agent will be used: \_\_\_\_\_  
Please attach a full description of the biological agent.

5.2 Will the biological agent be able to replicate in the host? YES NO

5.3 How will the biological agent be administered? \_\_\_\_\_

5.4 Please give the Health Care Facility where the clinical trial will be conducted: \_\_\_\_\_

5.5 Has human ethics approval been obtained? YES, number: \_\_\_\_\_ NO PENDING

**6.0 Animal Experiments**

6.1 Will live animals be used? YES ⊗ NO If no, please proceed to section 7.0

6.2 Name of animal species to be used \_\_\_\_\_

6.3 AUS protocol # \_\_\_\_\_

6.4 Will any of the agents listed in section 4.0 be used in live animals YES, specify: \_\_\_\_\_ NO

6.5 Will the agent(s) be shed by the animal: YES NO, please justify:  
\_\_\_\_\_  
\_\_\_\_\_

**7.0 Use of Animal species with Zoonotic Hazards**

7.1 Will any animals with zoonotic hazards or their organs, tissues, lavages or other body fluids including blood be used (see list below)? YES ⊗ No If no, please proceed to section 8.0

7.2 Please specify the animal(s) used:

- ◆ Pound source dogs YES NO
- ◆ Pound source cats YES NO
- ◆ Cattle, sheep or goats YES, please specify species \_\_\_\_\_ NO
- ◆ Non-human primates YES, please specify species \_\_\_\_\_ NO
- ◆ Wild caught animals YES, please specify species & colony # \_\_\_\_\_ NO
- ◆ Birds YES, please specify species \_\_\_\_\_ NO
- ◆ Others (wild or domestic) YES, please specify \_\_\_\_\_ NO



10.7 Please describe the risk (if any) of loss of the material from the lab and how this will be mitigated:

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10.8 Is the CFIA permit attached? YES NO  
If YES, Please attach the CFIA permit & describe any CFIA permit conditions:

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**11.0 Import Requirements**

11.1 Will any of the above agents be imported? YES, please give country of origin \_\_\_\_\_  NO  
If no, please proceed to Section 12.0

11.2 Has an Import Permit been obtained from HC for human pathogens? YES NO

11.3 Has an import permit been obtained from CFIA for animal or plant pathogens? YES NO

11.4 Has the import permit been sent to OHS? YES, please provide permit # \_\_\_\_\_ NO

**12.0 Training Requirements for Personnel Named on Form**

All personnel named on the above form who will be using any of the above named agents are required to attend the following training courses given by OHS:

- ◆ Biosafety
- ◆ Laboratory and Environmental/Waste Management Safety
- ◆ WHMIS (Western or equivalent)
- ◆ Employee Health and Safety Orientation

As the Principal Investigator, I have ensured that all of the personnel named on the form who will be using any of the biological agents in Sections 1.0 to 9.0 have been trained.

SIGNATURE \_\_\_\_\_ 

**13.0 Containment Levels**

13.1 For the work described in sections 1.0 to 9.0, please indicate the highest HC or CFIA Containment Level required. 1  2 2+ 3

13.2 Has the facility been certified by OHS for this level of containment?  
 YES, permit # if on-campus \_\_\_\_\_  
NO, please certify  
NOT REQUIRED for Level 1 containment

**14.0 Procedures to be Followed**

14.1 As the Principal Investigator, I will ensure that this project will follow the Western Biosafety Guidelines and Procedures Manual for Containment Level 1 & 2 Laboratories (and the Level 3 Facilities Manual for Level 3 projects). I will ensure that UWO faculty, staff and students working in my laboratory have an up-to-date Hazard Communication Form, found at <http://www.wph.uwo.ca/>

SIGNATURE Gregory Reid Date: 3 Dec 2010

14.2 Please describe additional risk reduction measures will be taken beyond containment level 1, 2, 2+ or 3 measures, that are unique to this agent.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14.3 Please outline what will be done if there is an exposure to the biological agents listed, such as a needlestick injury:

Appropriate precautions and first aid measures will be taken, incident will be reported to  
Occupational Health

**15.0 Approvals**

1) UWO Biohazards Subcommittee: SIGNATURE: \_\_\_\_\_  
Date: \_\_\_\_\_

2) Safety Officer for the University of Western Ontario  
SIGNATURE: \_\_\_\_\_  
Date: \_\_\_\_\_

3) Safety Officer for Institution where experiments will take place (if not UWO):  
SIGNATURE: [Signature]  
Date: Dec 10 2010

Approval Number: \_\_\_\_\_ Expiry Date (3 years from Approval): \_\_\_\_\_

Special Conditions of Approval:

have you read... **Anthology of Biosafety XI Worker Health and Safety Issues**  **Register Now!** **USDA ARS 1st International Biosafety and Biocontainment Symposium February 6-9, 2011, Baltimore, MD**  Agricultural Research Service

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## Risk Group Classification for Infectious Agents

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< [Main Riskgroup Page and Definitions](#)  
**SEARCH:** [Bacteria](#) > [Viruses](#) > [Fungi](#) > [Parasites](#) >

### Bacteria Search Results

Genus: Bifidobacterium		Species: dentium	
	Risk Group Level	Notes	
Australia/New Zealand 2002:			
Belgium 2004:			
Switzerland 2003:	2		
United Kingdom 2004:			
Germany 2001:	2		
NIH 2002			
European Community 2000:			
Singapore 2004:		Singapore Schedule:	
Japan:			
Human Pathogen: Yes		Select Agent CDC: No	
Animal Pathogen: No		Select Agent USDA: No	
Plant Pathogen: No			
MSDS:			

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Genus: Atopobium Species: rimae		Risk Group Level	Notes
Australia/New Zealand 2002:			
Belgium 2004:			
Switzerland 2003:		2	
United Kingdom 2004:			
Germany 2001:			
NIH 2002			
European Community 2000:			
Singapore 2004:			Singapore Schedule:
Japan:			
Human Pathogen: Yes Animal Pathogen: No Plant Pathogen: No			Select Agent CDC: No Select Agent USDA: No
MSDS:			
Genus: Atopobium Species: vaginae		Risk Group Level	Notes
Australia/New Zealand 2002:			
Belgium 2004:			
Switzerland 2003:		2	
United Kingdom 2004:			
Germany 2001:			
NIH 2002			
European Community 2000:			
Singapore 2004:			Singapore Schedule:
Japan:			
Human Pathogen: Yes Animal Pathogen: No Plant Pathogen: No			Select Agent CDC: No Select Agent USDA: No
MSDS:			

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## Risk Group Classification for Infectious Agents

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< Main Riskgroup Page and Definitions  
SEARCH: Bacteria > Viruses > Fungi > Parasites >

### Bacteria Search Results

Genus: Gardnerella		Species: vaginalis	
	Risk Group Level	Notes	
Australia/New Zealand 2002:	2		
Belgium 2004:	2		
Switzerland 2003:	2	(Haemophilus vaginalis)	
United Kingdom 2004:	2		
Germany 2001:	2	AR	
NIH 2002			
European Community 2000:	2		
Singapore 2004:		Singapore Schedule:	
Japan:			
Human Pathogen: Yes		Select Agent CDC: No	
Animal Pathogen: No		Select Agent USDA: No	
Plant Pathogen: No			
MSDS:			

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Genus: Enterococcus		Species: faecalis	
	Risk Group Level	Notes	
Australia/New Zealand 2002:			
Belgium 2004:	2		
Switzerland 2003:	2	(Streptococcus faecalis)	
United Kingdom 2004:			
Germany 2001:	2		
NIH 2002			
European Community 2000:			
Singapore 2004:		Singapore Schedule:	
Japan:	2		
Human Pathogen: Yes		Select Agent CDC: No	
Animal Pathogen: No		Select Agent USDA: No	
Plant Pathogen: No			

Genus: Enterococcus		Species: faecium	
	Risk Group Level	Notes	
Australia/New Zealand 2002:			
Belgium 2004:			
Switzerland 2003:	2	TA (Streptococcus faecium)	
United Kingdom 2004:			
Germany 2001:	2		
NIH 2002			
European Community 2000:			
Singapore 2004:		Singapore Schedule:	
Japan:	2		
Human Pathogen: Yes		Select Agent CDC: No	
Animal Pathogen: No		Select Agent USDA: No	
Plant Pathogen: No			

Genus: Enterococcus		Species: flavescens	
	Risk Group Level	Notes	
Australia/New Zealand 2002:			
Belgium 2004:			
Switzerland 2003:	2		
United Kingdom 2004:			
Germany 2001:			
NIH 2002			
European Community 2000:			
Singapore 2004:		Singapore Schedule:	
Japan:			
Human Pathogen: Yes		Select Agent CDC: No	
Animal Pathogen: No		Select Agent USDA: No	
Plant Pathogen: No			

Genus: Enterococcus		Species: gallinarum	
	Risk Group Level	Notes	
Australia/New Zealand 2002:			
Belgium 2004:			
Switzerland 2003:	2	t (Streptococcus gallinarum)	
United Kingdom 2004:			
Germany 2001:	2	t	
NIH 2002			
European Community 2000:			
Singapore 2004:		Singapore Schedule:	
Japan:			
Human Pathogen: No		Select Agent CDC: No	
Animal Pathogen: Yes		Select Agent USDA: No	
Plant Pathogen: No			

Genus: Enterococcus		Species: hirae	
	Risk Group Level	Notes	
Australia/New Zealand 2002:			
Belgium 2004:			

<b>Switzerland 2003:</b>	2	(Bacteroides denticola)
<b>United Kingdom 2004:</b>		
<b>Germany 2001:</b>		
<b>NIH 2002</b>		
<b>European Community 2000:</b>		
<b>Singapore 2004:</b>		Singapore Schedule:
<b>Japan:</b>		
<b>Human Pathogen:</b> Yes <b>Animal Pathogen:</b> No <b>Plant Pathogen:</b> No		<b>Select Agent CDC:</b> No <b>Select Agent USDA:</b> No
<b>MSDS:</b>		
<b>Genus:</b> Prevotella <b>Species:</b> disiens		
	<b>Risk Group Level</b>	<b>Notes</b>
<b>Australia/New Zealand 2002:</b>		
<b>Belgium 2004:</b>		
<b>Switzerland 2003:</b>	2	(Bacteroides disiens)
<b>United Kingdom 2004:</b>		
<b>Germany 2001:</b>		
<b>NIH 2002</b>		
<b>European Community 2000:</b>		
<b>Singapore 2004:</b>		Singapore Schedule:
<b>Japan:</b>		
<b>Human Pathogen:</b> Yes <b>Animal Pathogen:</b> No <b>Plant Pathogen:</b> No		<b>Select Agent CDC:</b> No <b>Select Agent USDA:</b> No
<b>MSDS:</b>		
<b>Genus:</b> Prevotella <b>Species:</b> intermedia		
	<b>Risk Group Level</b>	<b>Notes</b>
<b>Australia/New Zealand 2002:</b>		
<b>Belgium 2004:</b>		
<b>Switzerland 2003:</b>	2	(Bacteroides intermedius)
<b>United Kingdom 2004:</b>		
<b>Germany 2001:</b>		
<b>NIH 2002</b>		
<b>European Community 2000:</b>		
<b>Singapore 2004:</b>		Singapore Schedule:
<b>Japan:</b>		
<b>Human Pathogen:</b> No <b>Animal Pathogen:</b> No <b>Plant Pathogen:</b> No		<b>Select Agent CDC:</b> No <b>Select Agent USDA:</b> No
<b>MSDS:</b>		
<b>Genus:</b> Prevotella <b>Species:</b> loescheii		
	<b>Risk Group Level</b>	<b>Notes</b>
<b>Australia/New Zealand 2002:</b>		
<b>Belgium 2004:</b>		
<b>Switzerland 2003:</b>	2	(Bacteroides loescheii)
<b>United Kingdom 2004:</b>		
<b>Germany 2001:</b>		
<b>NIH 2002</b>		
<b>European Community 2000:</b>		
<b>Singapore 2004:</b>		Singapore Schedule:
<b>Japan:</b>		
<b>Human Pathogen:</b> Yes <b>Animal Pathogen:</b> No <b>Plant Pathogen:</b> No		<b>Select Agent CDC:</b> No <b>Select Agent USDA:</b> No
<b>MSDS:</b>		
<b>Genus:</b> Prevotella <b>Species:</b> melaninogenica		
	<b>Risk Group Level</b>	<b>Notes</b>
<b>Australia/New Zealand 2002:</b>		
<b>Belgium 2004:</b>		
<b>Switzerland 2003:</b>	2	(Bacteroides melaninogenicus, Bacteroides melaninogenicus subsp. melaninogenicus)
<b>United Kingdom 2004:</b>		
<b>Germany 2001:</b>		
<b>NIH 2002</b>		



## Lactobacillus spp. - Material Safety Data Sheets (MSDS)

# MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

### SECTION I - INFECTIOUS AGENT

**NAME:** *Lactobacillus* spp.

**SYNONYM OR CROSS REFERENCE:** *L. acidophilus*, *L. bifidus*, *L. bulgaricus*, *L. casei*, *L. viridescens*, *L. helveiticus*, *L. plantarum*

**CHARACTERISTICS:** Gram-positive large rods, non-spore forming, anaerobic or microaerophilic, occur singly or in pairs

### SECTION II - HEALTH HAZARD

**PATHOGENICITY:** Very rarely pathogenic; part of normal flora in man and animals (mouth, vagina, and intestinal tract); in the oral cavity, associated with dental caries but no known etiologic role; have been reported to cause endocarditis, neonatal meningitis and bacteremia

**EPIDEMIOLOGY:** Worldwide

**HOST RANGE:** Normal flora of humans and animals

**INFECTIOUS DOSE:** Not known

**MODE OF TRANSMISSION:** Not known

**INCUBATION PERIOD:** Not known

**COMMUNICABILITY:** Not transmitted from person-to-person

### SECTION III - DISSEMINATION

**RESERVOIR:** Widespread in nature, humans and animals

**ZOONOSIS:** None

**VECTORS:** None

### SECTION IV - VIABILITY

**DRUG SUSCEPTIBILITY:** Susceptible to antibiotics

**DRUG RESISTANCE:** vancomycin-resistant strains have been isolated

**SUSCEPTIBILITY TO DISINFECTANTS:** Susceptible to many disinfectants - 1% sodium hypochlorite and 70% ethanol, glutaraldehyde, formaldehyde, iodines

**PHYSICAL INACTIVATION:** Susceptible to moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour)

**SURVIVAL OUTSIDE HOST:** Feces - 2 days; cheese - 105 years;

**SURVEILLANCE:** None

**FIRST AID/TREATMENT:** Wash area in contact with warm water and soap (omit soap for mucous membrane exposure); drug therapy (penicillin and aminoglycosides)

**IMMUNIZATION:** None

**PROPHYLAXIS:** None

**LABORATORY-ACQUIRED INFECTIONS:** No reported cases of laboratory infections with *Lactobacillus* spp.

**SOURCES/SPECIMENS:** Dairy products and other food, feces, specimens from the mouth, vaginal swabs

**PRIMARY HAZARDS:** Hazard of infection from this organism is low, however, it is prudent to avoid accidental inoculation and ingestion

**SPECIAL HAZARDS:** None

**CONTAINMENT REQUIREMENTS:** No special design features beyond those suitable for a well designed and functional laboratory with good microbiology practices; this level of containment does not allow for any additional risk that may present for those persons with pre-existing disease, compromised immunity or who are pregnant

**PROTECTIVE CLOTHING:** Laboratory coat; gloves when contact with infected material is unavoidable

**OTHER PRECAUTIONS:** None

**SPILLS:** Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel and apply 1% sodium hypochlorite, starting at perimeter and working towards the centre; allow sufficient contact time (30 min) before clean up

**DISPOSAL:** Decontaminate before disposal; steam sterilization, chemical disinfection

**STORAGE:** In sealed containers that are appropriately labelled

**Date prepared:** March, 2001

**Prepared by:** Office of Laboratory Security, PHAC

Although the information, opinions and recommendations contained in this Material Safety Data Sheet are compiled from sources believed to be reliable, we accept no responsibility for the accuracy, sufficiency, or reliability or for any loss or injury resulting from the use of the information. Newly discovered hazards are frequent and this information may not be completely up to date.

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Date Modified: 2001-04-23

MATERIAL SAFETY DATA SHEET

LIBRARY EFFICIENCY DHSALPHA COMPETENT CELLS	Page	1 of 8
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MSDS ID: 18263	Replaces	9/05/03
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**1. PRODUCT AND COMPANY INFORMATION**

INVITROGEN CORPORATION  
 1600 FARADAY AVE.  
 CARLSBAD, CA 92008  
 760/603-7200

GIBCO PRODUCTS  
 INVITROGEN CORPORATION  
 3175 STALEY ROAD P.O. BOX 68  
 GRAND ISLAND, NY 14072  
 716/774-6700

INVITROGEN CORPORATION  
 3 FOUNTAIN DR.  
 INCHINNAN BUSINESS PARK  
 PAISLEY, PA4 9RF  
 SCOTLAND  
 44-141 814-6100

INVITROGEN CORPORATION  
 P.O. BOX 12-502  
 PENROSE  
 AUCKLAND 1135  
 NEW ZEALAND  
 64-9-579-3024

INVITROGEN CORPORATION  
 2270 INDUSTRIAL ST.  
 BURLINGTON, ONT  
 CANADA L7P 1A1  
 905/335-2255

EMERGENCY NUMBER (SPILLS, EXPOSURES): 301/431-8585 (24 HOUR)  
 800/451-8346 (24 HOUR)  
 800/955-6288

**NON-EMERGENCY INFORMATION:**

Product Name: LIBRARY EFFICIENCY DHSALPHA COMPETENT CELLS  
 Stock Number: 18263012

NOTE: If this product is a kit or is supplied with more than one material, please refer to the MSDS for each component for hazard information.

Product Use:  
 These products are for laboratory research use only and are not intended for human or animal diagnostics, therapeutic, or other clinical uses.

Synonyms:  
 Not available.

**2. COMPOSITION, INFORMATION ON INGREDIENTS**

The following list shows components of this product classified as hazardous based on physical properties and health effects:

Component	CAS No.	Percent
DIMETHYL SULFOXIDE	67-68-5	3 - 7

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**3. HAZARDS IDENTIFICATION**

\*\*\*\*\* EMERGENCY OVERVIEW \*\*\*\*\*  
 Warning!  
 Irritant.  
 Harmful if absorbed.  
 \*\*\*\*\*

Potential Health Effects:

Eye:  
 Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.

Skin:  
 Can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.  
 Upon prolonged or repeated exposure, harmful if absorbed through the skin.  
 May cause minor systemic damage.

Inhalation:

Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.  
 No toxicity expected from inhalation.

Ingestion:

Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.

Chronic:

No data on cancer.

**4. FIRST AID MEASURES**

Eye:

Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention.

Skin:

Wash with soap and water. Get medical attention if irritation develops or persists.

Inhalation:

Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately.

Ingestion:

Do not induce vomiting and seek medical attention immediately. Drink two

MATERIAL SAFETY DATA SHEET

LIBRARY EFFICIENCY DH5ALPHA COMPETENT CELLS INVITROGEN CORPORATION MSDS ID: 18263	Page 3 of 8 Revised 9/30/03 Replaces 9/05/03 Printed 9/30/03
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**4. FIRST AID MEASURES (CONT.)**

Glasses of water or milk to dilute. Provide medical care provider with this MSDS.

Note To Physician:  
Treat symptomatically.

**5. FIRE FIGHTING MEASURES**

- Flashpoint Deg C: Not available.
- Upper Flammable Limit %: Not available.
- Lower Flammable Limit %: Not available.
- Autoignition Temperature Deg C: Not available.

**Extinguishing Media:**  
Use alcohol resistant foam, carbon dioxide, dry chemical, or water spray when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the fire. Do not direct a water stream directly into the hot burning liquid. DMSO undergoes a violent exothermic reaction on mixing with copper wool and trichloroacetic acid. On mixing with potassium permanganate it will flash instantaneously. It reacts violently with: acid halides, cyanuric chloride, silicon tetrachloride, phosphorus trichloride and trioxide, thionyl chloride, magnesium perchlorate, silver fluoride, methyl bromide, iodine pentafluoride, nitrogen periodate, diborane, sodium hydride, perchloric and periodic acids. When heated above its boiling point, DMSO degrades giving off formaldehyde, methyl mercaptan, and sulfur dioxide.

**Firefighting Techniques/Equipment:**  
Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products.

**Hazardous Combustion Products:**  
Carbon dioxide Carbon monoxide Sulfur containing gases

**6. ACCIDENTAL RELEASE MEASURES**

Accidental releases may be subject to special reporting requirements and other regulatory mandates. Refer to Section 8 for personal protection equipment recommendations.

**6. ACCIDENTAL RELEASE MEASURES (CONT.)**

Spill Cleanup:  
 Exposure to the spilled material may be irritating or harmful. Follow personal protective equipment recommendations found in Section VIII of this MSDS. Additional precautions may be necessary based on special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred. Also consider the expertise of employees in the area responding to the spill. Ventilate the contaminated area.  
 Absorb spill. Common absorbent materials should be effective. Deposit in appropriate containers for removal and disposal.

**7. HANDLING AND STORAGE**

Storage of some materials is regulated by federal, state, and/or local laws.

Storage Pressure:  
 Ambient

Handling Procedures:  
 Harmful or irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area.  
 Keep closed or covered when not in use.

Storage Procedures:  
 Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed.  
 Suitable for most general chemical storage areas.

**8. EXPOSURE CONTROLS, PERSONAL PROTECTION**

Exposure Limits:  
 Component OSHA PEL AGCIH TWA  
 DIMETHYL SULFOXIDE (ppm) (ppm)  
 Not established. Not established.

Engineering Controls:  
 Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

Personal Protective Equipment:

Eye:  
 Safety glasses should be the minimum eye protection.  
 Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash

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**8. EXPOSURE CONTROLS, PERSONAL PROTECTION (CONT.)**

goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

**Skin:**  
 Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work. Gloves should be used as minimum hand protection.

**Respiratory:**  
 Use supplied-air respiratory equipment as required.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance/physical state:** Liquid solution / suspension  
**Odor:** No odor.

Not established.  
 Not established.

**Specific Gravity/Density:**  
**Octanol/water Partition Coeff:**  
**Volatiles:**  
**Evaporation Rate:**  
**Viscosity:**

**10. STABILITY AND REACTIVITY**

**Stability:**  
 Stable under normal conditions.

**Conditions to Avoid:**  
 Strong oxidizing agents. Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition. Strong alkalis. DMSO undergoes a violent exothermic reaction on mixing with copper wool and trichloroacetic acid. On mixing with potassium permanganate it will flash instantaneously. It reacts violently with: acid halides, cyanuric chloride, silicon tetrachloride, phosphorus trichloride and trioxide, thionyl chloride, magnesium perchlorate, silver fluoride, methyl bromide, iodine pentafluoride, nitrogen periodate, diborane, sodium hydride, perchloric and periodic acids. When heated above its boiling point, DMSO

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#### 10. STABILITY AND REACTIVITY (CONT.)

degrades giving off formaldehyde, methyl mercaptan, and sulfur dioxide.

Hazardous Decomposition Products:

Carbon monoxide. Carbon dioxide. Sulfur containing gases.

Hazardous Polymerization:

Hazardous polymerization will not occur.

#### 11. TOXICOLOGICAL INFORMATION

Acute Toxicity:

Dermal/Skin:

DIMETHYL SULFOXIDE: 40 GM/KG

Inhalation/Respiratory:

Not determined.

Oral/Ingestion:

DIMETHYL SULFOXIDE: 14,500 MG/KG

Target Organs: Blood. Eyes. Skin.

Carcinogenicity:

NTP:

Not tested.

IARC:

Not listed.

OSHA:

Not regulated.

Other Toxicological Information

#### 12. Ecological Information

Ecotoxicological Information: No ecological information available.

Environmental Fate (Degradation, Transformation, and Persistence):

Bioconcentration is not expected to occur.

Biodegrades slowly.

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**13. DISPOSAL CONSIDERATIONS**

Regulatory Information:  
Not applicable.

Disposal Method:  
Clean up and dispose of waste in accordance with all federal, state, and local environmental regulations.  
Dispose of by incineration following Federal, State, Local, or Provincial regulations.

**14. TRANSPORT INFORMATION**

Proper Shipping Name: Not Determined.  
Subsidiary Hazards:

**15. REGULATORY INFORMATION**

UNITED STATES:

TSCA:

This product is solely for research and development purposes only and may not be used, processed or distributed for a commercial purpose. It may only be handled by technically qualified individuals.

Prop 65 Listed Chemicals:  
No Prop 65 Chemicals.

PROP 65

PERCENT

No 313 Chemicals

CANADA:

DSL/NDSL:  
Not determined.

COMPONENT  
DIMETHYL SULFOXIDE

WHMIS Classification  
D2B

EUROPEAN UNION:

PRODUCT RISK PHRASES:

None assigned.

PRODUCT SAFETY PHRASES:

Not applicable.

PRODUCT CLASSIFICATION:

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**15. REGULATORY INFORMATION (CONT.)**

Not classified

Component  
DIMETHYL SULFOXIDE

EINECS  
Number  
200-664-3

**16. OTHER INFORMATION**

HMIS Rating 0-4:  
FIRE: Not determined.  
HEALTH: Not determined.  
REACTIVITY: Not determined.

Abbreviations

- N/A - Data is not applicable or not available
- SARA - Superfund and Reauthorization Act
- HMIS - Hazard Material Information System
- WHMIS - Workplace Hazard Materials Information System
- NTP - National Toxicology Program
- OSHA - Occupational Health and Safety Administration
- IARC - International Agency for Research on Cancer
- PROP 65 - California Safe Drinking Water and Toxic Enforcement Act of 1986
- EINECS - European Inventory of Existing Commercial Chemical Substances

The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since Invitrogen Corporation cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS MSDS DOES NOT CONSTITUTE A WARRANTY, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.



Office of Biohazard Containment and Safety  
Science Branch, CFIA  
59 Camelot Drive, Ottawa, Ontario K1A 0Y9  
Tel: (613) 221-7068 Fax: (613) 228-6129  
Email: ImportZoopath@inspection.gc.ca

Bureau du confinement des biorisques et sécurité  
Direction générale des sciences, ACIA  
59 promenade Camélot, Ottawa, Ontario K1A 0Y9  
Tél: (613) 221-7068 Téléc: (613) 228-6129  
Courriel: ImportZoopath@inspection.gc.ca

October 20<sup>th</sup>, 2009

Ms. Shamila Survery / Mr. Michael Decosimo  
Cedariane Laboratories Ltd  
4410 Paletta Court  
Burlington, Ontario L7L 5R2

By Facsimile: (289) 288-0020

SUBJECT: **Importation of *Escherichia coli* strains**

Dear Ms. Survery / Mr. Decosimo:

Our office received your query about the importation of *Escherichia coli* from the American Type Culture Collection (ATCC) located in Manassas, Virginia, United States. The following *Escherichia coli* strains are considered to be level 1 animal pathogens:

- |               |                    |           |                   |                |
|---------------|--------------------|-----------|-------------------|----------------|
| • 5K          | • CIE85            | • J52     | • MC4100 (MuLac)  | • U5/41        |
| • 58          | • DH1              | • J53     | • MG1655          | • W208         |
| • 58-161      | • DH10 GOLD        | • JC3272  | • MM294           | • W945         |
| • 679         | • DH10B            | • JC7661  | • MS101           | • W1485        |
| • 1532        | • DH5              | • JC9387  | • NC-7            | • W3104        |
| • AB284       | • <b>DH5-alpha</b> | • JF1504  | • Nissle 1917     | • W3110        |
| • AB311       | • DP50             | • JF1508  | • One Shot STBL3  | • WA704        |
| • AB1157      | • DY145            | • JF1509  | • OP50            | • WP2          |
| • AB1206      | • DY380            | • JJ055   | • P678            | • X1854        |
| • AG1         | • E11              | • JM83    | • PA309           | • X2160T       |
| • B           | • EJ183            | • JM101   | • PK-5            | • X2541        |
| • BB4         | • EL250            | • JM109   | • PMC103          | • X2547T       |
| • BD792       | • EMG2             | • K12     | • PR13            | • XL1-BLUE     |
| • BL21        | • EPI 300          | • KC8     | • Rri             | • XL1-BLUE-MRF |
| • BL21 (DE3)  | • EZ10             | • KA802   | • RV308           | • XL0LR        |
| • BM25.8      | • FDA Seattle 1946 | • KAM32   | • S17-1λ -PIR     | • Y10          |
| • C           | • Fusion-Blue      | • KAM33   | • SCS1            | • Y1090 (1090) |
| • C-1a        | • H1443            | • KAM43   | • SMR10           | • YN2980       |
| • C-3000      | • HF4714           | • LE450   | • SOLR            | • W3110        |
| • C25         | • HB101            | • LE451   | • SuperchargeEZ10 | • WG1          |
| • C41 (DE3)   | • HS(PFAMP)R       | • LE452   | • SURE            | • WG439        |
| • C43 (DE3)   | • Hfr3000          | • MB408   | • TOP10           | • WG443        |
| • C600        | • Hfr3000 X74      | • MBX1928 | • TG1             | • WG445        |
| • Cavalli Hfr | • HMS174           | • MC1061  |                   |                |

The Office of Biohazard Containment and Safety (BCS) of the Canadian Food Inspection Agency (CFIA) only issues import permits for microorganisms that are pathogenic to animals, or parts of microorganisms that are pathogenic to animals. As the products listed above are not considered pathogenic to animals, the Office of BCS does not have any regulatory requirements for their importation.

Please note that other legislation may apply. You may wish to contact the Public Health Agency of Canada's (PHAC) Office of Laboratory Security at (613) 957-1779.

Note: Microorganisms pathogenic to animals and veterinary biologics require an import permit from the CFIA.

Sincerely,

Cinthia Labrie  
Head, Animal Pathogen Importation Program  
Office of Biohazard Containment & Safety

Canada

**MSDS FOR ANIMAL CELL CULTURES (Biosafety Level 1 or 2)**

ATCC cultures are not hazardous as defined by OSHA 1910.1200. However, as live cells they are potential biohazards.

**ATCC Emergency Telephone:** (703) 365-2710 (24 hours)

**Chemtrec:** (800) 424-9300

To be used only in the event of an emergency involving a spill, leak, fire, exposure or accident.

**Description**

Either frozen or growing cells shipped in liquid cell culture medium (a mixture of components that may include, but is not limited to: inorganic salts, vitamins, amino acids, carbohydrates and other nutrients dissolved in water).

**SECTION I****Hazardous Ingredients**

Frozen cultures may contain 5 to 10% Dimethyl sulfoxide (DMSO)

**SECTION II****Physical data**

Pink or red aqueous liquid

**SECTION III****Health hazards****For Biosafety Level 1 Cell Lines**

This cell line is not known to harbor an agent known to cause disease in healthy adult humans. This cell line has **NOT** been screened for Hepatitis B, human immunodeficiency viruses or other adventitious agents. Handle as a potentially biohazardous material under at least Biosafety Level 1 containment.

**For Biosafety Level 2 Cell Lines**

This cell line is known to contain an agent that requires handling at Biosafety Level 2 containment [U.S. Government Publication **Biosafety in Microbiological and Biomedical Laboratories** (CDC, 1999)]. These agents have been associated with human disease. This cell line has **NOT** been screened for Hepatitis B, human immunodeficiency viruses or other adventitious agents. Cell lines derived from primate lymphoid tissue may fall under the regulations of 29 CFR 1910.1030 Bloodborne Pathogens.

**SECTION IV****Fire and explosion**

Not applicable

**SECTION V****Reactivity data**

Stable. Hazardous polymerization will not occur.

**SECTION VI****Method of disposal**

Spill: Contain the spill and decontaminate using suitable disinfectants such as chlorine bleach or 70% ethyl or isopropyl alcohol.

Waste disposal: Dispose of cultures and exposed materials by autoclaving at 121°C for 20 minutes. Follow all Federal, State and local regulations.

**SECTION VII****Special protection information****For Biosafety Level 1 Cell Lines**

Handle as a potentially biohazardous material under at least Biosafety Level 1 containment. Cell lines derived from primate lymphoid tissue may fall under the regulations of 29 CFR 1910.1030 Bloodborne Pathogens.

**For Biosafety Level 2 Cell Lines**

Handle as a potentially biohazardous material under at least Biosafety Level 2 containment. Cell lines derived from primate lymphoid tissue may fall under the regulations of 29 CFR 1910.1030 Bloodborne Pathogens.

**SECTION VIII****Special precautions or comments**

ATCC recommends that appropriate safety procedures be used when handling all cell lines, especially those derived from human or other primate material. Detailed discussions of laboratory safety procedures are provided in **Laboratory Safety: Principles and Practice** (Fleming, et al., 1995) the ATCC manual on quality control (Hay, et al., 1992), the *Journal of Tissue Culture Methods* (Caputo, 1988), and in the U.S. Government Publication, **Biosafety in Microbiological and Biomedical Laboratories** (CDC, 1999). This publication is available in its entirety in the Center for Disease Control Office of Health and Safety's web site at <http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm>.

**THE ABOVE INFORMATION IS CORRECT TO THE BEST OF OUR KNOWLEDGE. ALL MATERIALS AND MIXTURES MAY PRESENT UNKNOWN HAZARDS AND SHOULD BE USED WITH CAUTION. THE USER SHOULD MAKE INDEPENDENT DECISIONS REGARDING THE COMPLETENESS OF THE INFORMATION BASED ON ALL SOURCES AVAILABLE. ATCC SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR CONTACT WITH THE ABOVE PRODUCT.**

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February 2002

# Info on Cell Line(s)

## Cell Biology

ATCC® Number: **CRL-2616™** [Order this Item](#) Price: **\$338.00**

Designations: **VK2/E6E7**

Depositors: D Anderson, RN Fichorova, JG Rheinwald

Biosafety Level: 2 [Cells contain human Papilloma viral sequences ]

Shipped: frozen

Medium & Serum: [See Propagation](#)

Growth Properties: adherent

Organism: *Homo sapiens* (human)

Morphology: epithelial

Source: **Organ:** vagina

**Tissue:** mucosa

**Cell Type:** epithelialHPV-16 E6/E7 transformed

cytokeratins 8 (CK8), 10 (CK10), 13 (CK13), 18 (CK18) and 19 (CK19) [52983]

Cellular Products:

macrophage colony-stimulating factor (M-CSF); transforming growth factor beta1; interleukin 8 (IL-8); prostaglandin E2; the secretory leukoproteinase inhibitor; polymeric immunoglobulin receptor [52984]

Permits/Forms:

In addition to the [MTA](#) mentioned above, other [ATCC and/or regulatory permits](#) may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please [click here](#) for information regarding the specific requirements for shipment to your location.

Restrictions:

The line is available with the following restrictions: 1. This cell line was deposited at the ATCC by Dr. Deborah Anderson of The Brigham and Women's Hospital, Inc. and is provided for academic research purposes only. Neither the cell line nor products derived from it may be sold or used for commercial purposes, including screening of compounds. Nor can the cells be distributed to third parties for purposes of sale, or producing for sale, cells or their products. The cells are provided as a service to the research community. They are provided without warranty of merchantability or fitness for a particular purpose or any other warranty, express or implied. 2. All products derived from the cells or genetically altered forms of the cells cannot be commercialized without express written permission from the The Brigham and Women's Hospital, Inc. 3. Any proposed commercial manufacture, use, or sale of the these cells, or their products must first be approved and the terms for such commercial manufacture, use, or sale must first be negotiated with TheBrigham and Women's Hospital, Inc., Office of Corporate Sponsored Research and Licensing, 75 Francis Street, Boston, MA 02115 (617) 525-6010.

Isolation: **Isolation date:** 1996

### Related Links ▶

[NCBI Entrez Search](#)

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[Frequently Asked Questions](#)

[Material Transfer Agreement](#)

[Technical Support](#)

[Related Cell Culture Products](#)

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- [community](#)

## Cell Biology

ATCC® Number:	<b>HTB-37™</b>	<a href="#">Order this Item</a>	Price:	<b>\$272.00</b>
Designations:	<b>Caco-2</b>			
Depositors:	J Fogh			
<u>Biosafety Level:</u>	1			
Shipped:	frozen			
Medium & Serum:	<a href="#">See Propagation</a>			
Growth Properties:	adherent			
Organism:	<i>Homo sapiens</i> (human) epithelial			
Morphology:	 PHOTO			
Source:	<b>Organ:</b> colon <b>Disease:</b> colorectal adenocarcinoma keratin			
Cellular Products:	retinoic acid binding protein 1 retinol binding protein 2			
Permits/Forms:	In addition to the <a href="#">MTA</a> mentioned above, other <a href="#">ATCC and/or regulatory permits</a> may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please <a href="#">click here</a> for information regarding the specific requirements for shipment to your location.			
Restrictions:	NaviCyte Scientific holds the exclusive commercial distribution rights to the Caco-2 cell line as deposited by the Memorial Sloan-Kettering Cancer Center (SK) with the American Type Culture Collection (ATCC ). <b>Note:</b> All uses of ATCC ® HTB-37™, other than for research by a non-commercial or academic entity, require a license and use authorization from NaviCyte Scientific under its exclusive arrangement with Memorial Sloan-Kettering.			
Applications:	transfection host ( <a href="#">Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents</a> )			
Receptors:	heat stable enterotoxin (Sta, E. coli), expressed epidermal growth factor (EGF), expressed			
Virus Susceptibility:	Human immunodeficiency virus 1			
Tumorigenic:	Yes			
DNA Profile (STR):	Amelogenin: X CSF1PO: 11 D13S317: 11,13,14 D16S539: 12,13 D5S818: 12,13 D7S820: 11,12 TH01: 6 TPOX: 9,11 vWA: 16,18			

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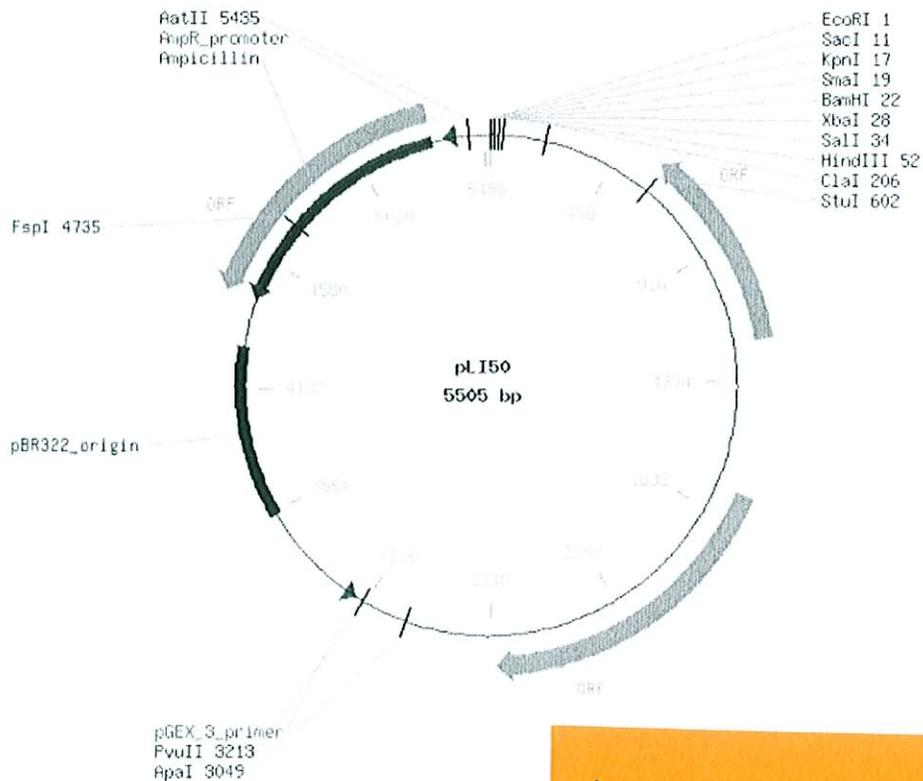
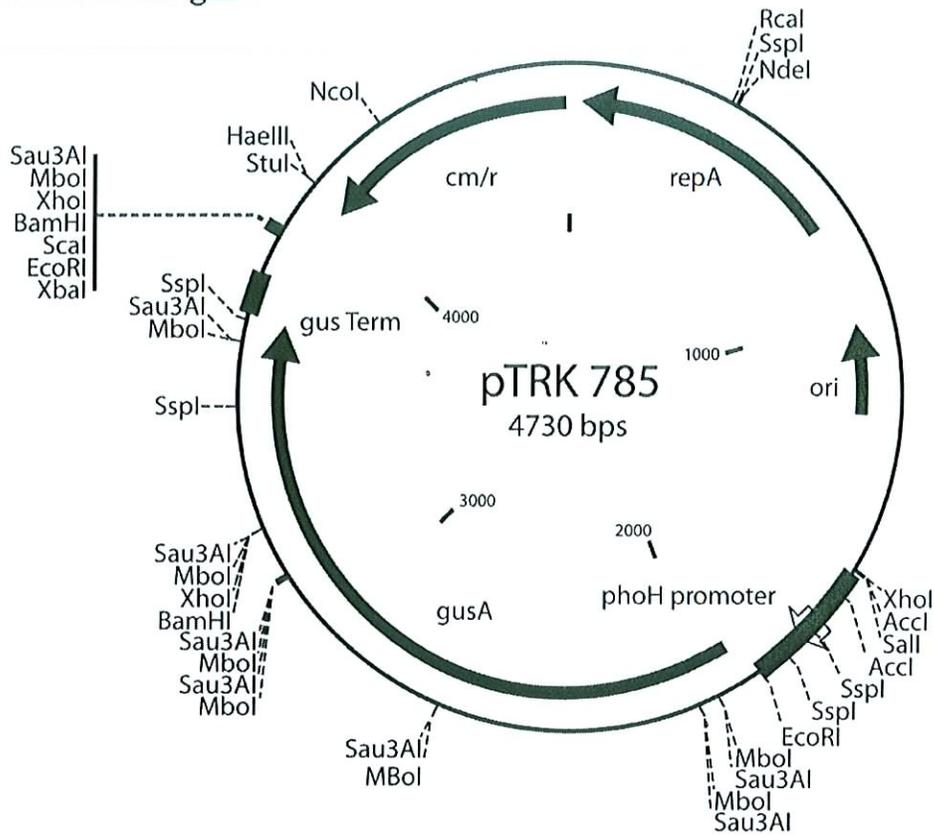
- [BioStandards](#)

[Biological Reference Material and Consensus Standards for the life science community](#)

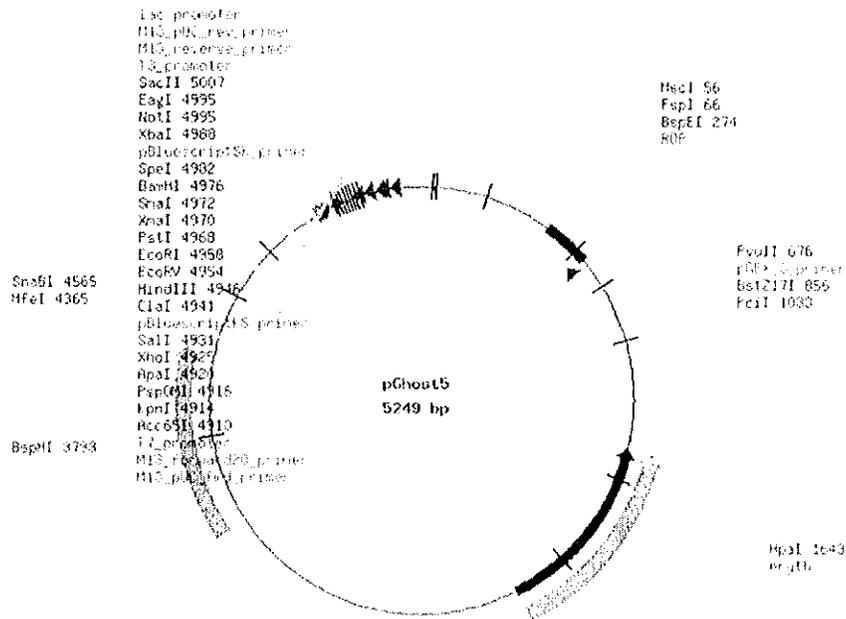
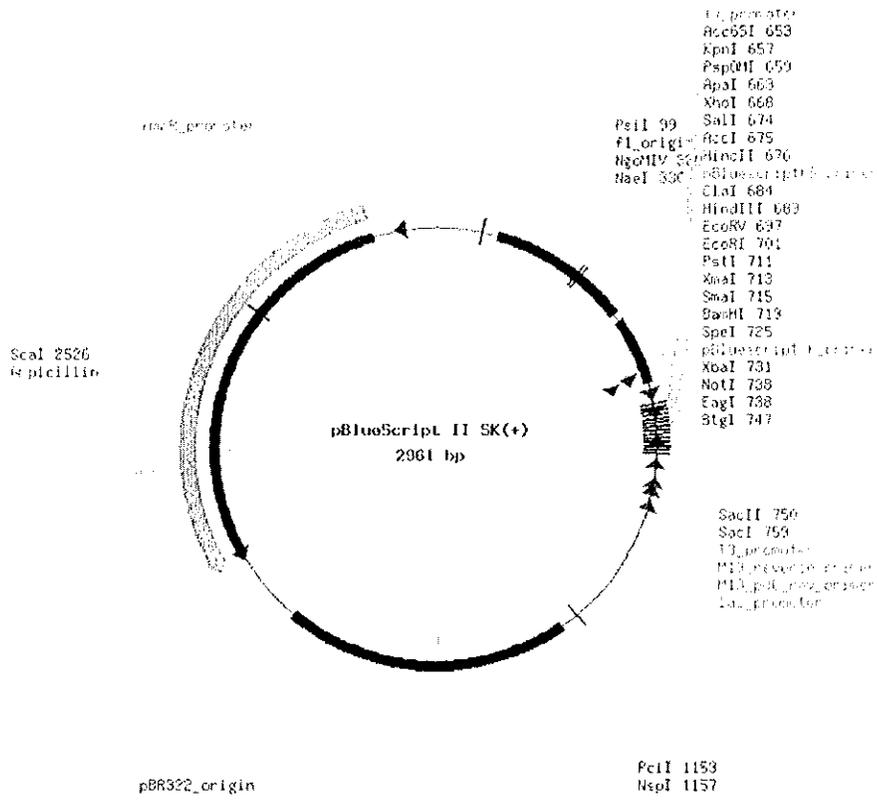
- [community](#)

# Appendices

## Plasmids Used for Cloning



Info on Plasmid(s)



B-11 2017

## Material Safety Data Sheet

Version 4.1  
 Revision Date 10/26/2010  
 Print Date 12/03/2010

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Aflatoxin M<sub>1</sub>

Product Number : A6428

Brand : Sigma

Product Use : For laboratory research purposes

Supplier : Sigma-Aldrich Canada, Ltd  
 2149 Winston Park Drive  
 OAKVILLE ON L6H 6J8  
 CANADA

Telephone : +19058299500

Fax : +19058299292

Emergency Phone # (For both supplier and manufacturer) : 1-800-424-9300

Preparation Information : Sigma-Aldrich Corporation  
 Product Safety - Americas Region  
 1-800-521-8956



### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

#### Target Organs

Liver

#### WHMIS Classification

D1A	Very Toxic Material Causing Immediate and Serious Toxic Effects	Highly toxic by ingestion Highly toxic by skin absorption Highly toxic by inhalation
-----	---	--

#### GHS Classification

Acute toxicity, Inhalation (Category 2)  
 Acute toxicity, Dermal (Category 2)  
 Acute toxicity, Oral (Category 2)  
 Carcinogenicity (Category 1B)

#### GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H300 + H310	Fatal if swallowed or in contact with skin.
H330	Fatal if inhaled.
H350	May cause cancer.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash skin thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.  
 P271 Use only outdoors or in a well-ventilated area.  
 P280 Wear protective gloves/ protective clothing.  
 P284 Wear respiratory protection.  
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.  
 P302 + P350 IF ON SKIN: Gently wash with plenty of soap and water.  
 P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.  
 P310 Immediately call a POISON CENTER or doctor/ physician.  
 P320 Specific treatment is urgent (see supplemental first aid instructions on this label).  
 P330 Rinse mouth.  
 P361 Remove/ Take off immediately all contaminated clothing.  
 P363 Wash contaminated clothing before reuse.  
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.  
 P405 Store locked up.  
 P501 Dispose of contents/ container to an approved waste disposal plant.

**HMIS Classification**

Health hazard: 3  
 Chronic Health Hazard: \*  
 Flammability: 0  
 Physical hazards: 1

**Potential Health Effects**

**Inhalation** May be fatal if inhaled. May cause respiratory tract irritation.  
**Skin** May be fatal if absorbed through skin. May cause skin irritation.  
**Eyes** May cause eye irritation.  
**Ingestion** May be fatal if swallowed.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Formula : C<sub>17</sub>H<sub>12</sub>O<sub>7</sub>  
 Molecular Weight : 328.27 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
<b>Aflatoxin M1</b>			
6795-23-9	229-865-4	-	-

**4. FIRST AID MEASURES**

**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Flush eyes with water as a precaution.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**5. FIRE-FIGHTING MEASURES**

**Conditions of flammability**

Not flammable or combustible.

**Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for fire-fighters**

Wear self contained breathing apparatus for fire fighting if necessary.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides

**Explosion data - sensitivity to mechanical impact**

no data available

**Explosion data - sensitivity to static discharge**

no data available

---

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**Methods and materials for containment and cleaning up**

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

---

**7. HANDLING AND STORAGE****Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

**Conditions for safe storage**

Keep container tightly closed in a dry and well-ventilated place.

Light sensitive.

---

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Contains no substances with occupational exposure limit values.

**Personal protective equipment****Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**Specific engineering controls**

Use mechanical exhaust or laboratory fumehood to avoid exposure.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Form	solid
Colour	no data available

### Safety data

pH	no data available
Melting/freezing point	no data available
Boiling point	no data available
Flash point	no data available
Ignition temperature	no data available
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	no data available
Water solubility	no data available
Partition coefficient: n-octanol/water	no data available
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

---

## 10. STABILITY AND REACTIVITY

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

no data available

### Conditions to avoid

no data available

### Materials to avoid

Strong oxidizing agents

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

---

## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Oral LD50

no data available

#### Inhalation LC50

#### Dermal LD50

no data available

### Other information on acute toxicity

no data available

**Skin corrosion/irritation**

no data available

**Serious eye damage/eye irritation**

no data available

**Respiratory or skin sensitization**

no data available

**Germ cell mutagenicity**

no data available

**Carcinogenicity**

Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Aflatoxin M1)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**Reproductive toxicity**

no data available

**Teratogenicity**

no data available

**Specific target organ toxicity - single exposure (Globally Harmonized System)**

no data available

**Specific target organ toxicity - repeated exposure (Globally Harmonized System)**

no data available

**Aspiration hazard**

no data available

**Potential health effects**

<b>Inhalation</b>	May be fatal if inhaled. May cause respiratory tract irritation.
<b>Ingestion</b>	May be fatal if swallowed.
<b>Skin</b>	May be fatal if absorbed through skin. May cause skin irritation.
<b>Eyes</b>	May cause eye irritation.

**Signs and Symptoms of Exposure**

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Synergistic effects**

no data available

**Additional Information**

RTECS: Not available

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**12. ECOLOGICAL INFORMATION**

**Toxicity**

no data available

**Persistence and degradability**

no data available

**Bioaccumulative potential**

no data available

**Mobility in soil**

no data available

**PBT and vPvB assessment**

no data available

**Other adverse effects**

no data available

---

**13. DISPOSAL CONSIDERATIONS****Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

---

**14. TRANSPORT INFORMATION****DOT (US)**

UN-Number: 3462 Class: 6.1

Packing group: I

Proper shipping name: Toxins, extracted from living sources, solid, n.o.s. (Aflatoxin M1)

Marine pollutant: No

Poison Inhalation Hazard: No

**IMDG**

UN-Number: 3462 Class: 6.1

Packing group: I

EMS-No: F-A, S-A

Proper shipping name: TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S. (Aflatoxin M1)

Marine pollutant: No

**IATA**

UN-Number: 3462 Class: 6.1

Packing group: I

Proper shipping name: Toxins, extracted from living sources, solid, n.o.s. (Aflatoxin M1)

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**15. REGULATORY INFORMATION****DSL Status**

This product contains the following components that are not on the Canadian DSL nor NDSL lists.

Aflatoxin M1	CAS-No. 6795-23-9
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**WHMIS Classification**

D1A	Very Toxic Material Causing Immediate and Serious Toxic Effects	Highly toxic by ingestion Highly toxic by skin absorption Highly toxic by inhalation
-----	---	--

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

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**16. OTHER INFORMATION****Further information**

Copyright 2010 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

**Material Safety Data Sheet**Version 3.0  
Revision Date 10/27/2009  
Print Date 07/12/2010**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : **Aflatoxin B<sub>1</sub> solution**

Product Number : 44647-U  
Brand : Supelco

Company : Sigma-Aldrich Canada, Ltd  
2149 Winston Park Drive  
OAKVILLE ON L6H 6J8  
CANADA

Telephone : +19058299500  
Fax : +19058299292  
Emergency Phone # : 800-424-9300

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

CAS-No.	EC-No.	Index-No.	Concentration
<b>Methanol</b>			
67-56-1	200-659-6	603-001-00-X	>= 99 - <= 100 %
<b>Aflatoxin B1</b>			
1162-65-8	214-603-3	-	<= 0.001 %

**3. HAZARDS IDENTIFICATION****Emergency Overview****Target Organs**

Eyes, Kidney, Liver, Heart, Central nervous system

**WHMIS Classification**

B2	Flammable liquid	Flammable liquid
D1A		Highly toxic by inhalation
D1B		Toxic by ingestion
D2B		Toxic by skin absorption
		Moderate skin irritant
		Moderate eye irritant

**HMIS Classification**

Health hazard: 3  
Chronic Health Hazard: \*  
Flammability: 3  
Physical hazards: 0

**Potential Health Effects**

<b>Inhalation</b>	Toxic if inhaled. Causes respiratory tract irritation.
<b>Skin</b>	Toxic if absorbed through skin. Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.
<b>Ingestion</b>	Toxic if swallowed.

#### 4. FIRST AID MEASURES

##### General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

##### If inhaled

If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

##### In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

##### In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

##### If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

#### 5. FIRE-FIGHTING MEASURES

##### Flammable properties

Flash point 10 °C (50 °F) - closed cup

Ignition temperature no data available

##### Suitable extinguishing media

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

##### Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

##### Further information

Use water spray to cool unopened containers.

#### 6. ACCIDENTAL RELEASE MEASURES

##### Personal precautions

Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

##### Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

##### Methods for cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

#### 7. HANDLING AND STORAGE

##### Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

**Storage**

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.

Recommended storage temperature: 2 - 8 °C

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Update	Basis
Methanol	67-56-1	TWA	200 ppm	2006-11-29	Canada. British Columbia OEL
Remarks	Contributes significantly to the overall exposure by the skin route.				
		STEL	250 ppm	2006-11-29	Canada. British Columbia OEL
	Contributes significantly to the overall exposure by the skin route.				
		TWAE V	200 ppm 260 mg/m <sup>3</sup>	2005-12-17	Canada. Ontario OELs
	Skin				
		STEV	250 ppm 325 mg/m <sup>3</sup>	2005-12-17	Canada. Ontario OELs
	Skin				
		TWA	200 ppm 262 mg/m <sup>3</sup>	2004-04-30	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
	Substance may be readily absorbed through intact skin				
		STEL	250 ppm 328 mg/m <sup>3</sup>	2004-04-30	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
	Substance may be readily absorbed through intact skin				
		TWAE V	200 ppm 262 mg/m <sup>3</sup>	2006-12-29	Canada. Quebec OELs
	Skin (percutaneous)				
		STEV	250 ppm 328 mg/m <sup>3</sup>	2006-12-29	Canada. Quebec OELs
	Skin (percutaneous)				
		TWA	200 ppm 262 mg/m <sup>3</sup>	2007-01-01	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)

Substance may be readily absorbed through intact skin					
		STEL	250 ppm 328 mg/m3	2007-01-01	Canada, Alberta, Occupational Health and Safety Code (table 2: OEL)
Substance may be readily absorbed through intact skin					

#### Personal protective equipment

##### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

##### Hand protection

Handle with gloves.

##### Eye protection

Face shield and safety glasses

##### Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

##### Hygiene measures

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Form                      liquid

### Safety data

pH                              no data available  
Melting point                -98 °C (-144 °F)  
Boiling point                 65 °C (149 °F) at 1,013 hPa (760 mmHg)  
Flash point                    10 °C (50 °F) - closed cup  
Ignition temperature        no data available  
Lower explosion limit        6 %(V)  
Upper explosion limit        36.5 %(V)  
Vapour pressure              129 hPa (97 mmHg) at 25 °C (77 °F)  
Density                        0.790 g/cm3  
Water solubility              no data available  
Evaporation rate              5.9

## 10. STABILITY AND REACTIVITY

### Storage stability

Stable under recommended storage conditions.

### Conditions to avoid

Heat, flames and sparks.

**Materials to avoid**

Acids, Oxidizing agents, Alkali metals, Acid chlorides, Acid anhydrides, Reducing agents

**Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides

**Hazardous reactions**

Vapours may form explosive mixture with air.

**11. TOXICOLOGICAL INFORMATION****Acute toxicity**

no data available

**Irritation and corrosion**

no data available

**Sensitisation**

no data available

**Chronic exposure**

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**Signs and Symptoms of Exposure**

Methyl alcohol may be fatal or cause blindness if swallowed., Cannot be made non-poisonous., Effects due to ingestion may include:, Nausea, Dizziness, Gastrointestinal disturbance, Weakness, Confusion., Drowsiness, Unconsciousness, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Potential Health Effects**

<b>Inhalation</b>	Toxic if inhaled. Causes respiratory tract irritation.
<b>Skin</b>	Toxic if absorbed through skin. Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.
<b>Ingestion</b>	Toxic if swallowed.
<b>Target Organs</b>	Eyes, Kidney, Liver, Heart, Central nervous system,

**12. ECOLOGICAL INFORMATION****Elimination information (persistence and degradability)**

no data available

**Ecotoxicity effects**

no data available

**Further information on ecology**

no data available

**13. DISPOSAL CONSIDERATIONS****Product**

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**  
Dispose of as unused product.

#### 14. TRANSPORT INFORMATION

##### DOT (US)

UN-Number: 1230 Class: 3 Packing group: II  
Proper shipping name: Methanol, solution  
Reportable Quantity (RQ): 5000 lbs  
Marine pollutant: No  
Poison Inhalation Hazard: No

##### IMDG

UN-Number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D  
Proper shipping name: METHANOL, SOLUTION  
Marine pollutant: No

##### IATA

UN-Number: 1230 Class: 3 (6.1) Packing group: II  
Proper shipping name: Methanol, solution

#### 15. REGULATORY INFORMATION

##### DSL Status

This product contains the following components that are not on the Canadian DSL nor NDSL lists.

Aflatoxin B1

CAS-No.  
1162-65-8

##### WHMIS Classification

B2 Flammable liquid  
D1A  
D1B  
D2B

Flammable liquid  
Highly toxic by inhalation  
Toxic by ingestion  
Toxic by skin absorption  
Moderate skin irritant  
Moderate eye irritant

#### 16. OTHER INFORMATION

##### Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

## Material Safety Data Sheet

Version 4.2  
 Revision Date 11/29/2010  
 Print Date 12/03/2010

### 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : **Ochratoxin A**

Product Number : O1877  
 Brand : Sigma  
 Product Use : For laboratory research purposes.

Supplier : Sigma-Aldrich Canada, Ltd  
 2149 Winston Park Drive  
 OAKVILLE ON L6H 6J8  
 CANADA

Manufacturer : Sigma-Aldrich Corporation  
 3050 Spruce St.  
 St. Louis, Missouri 63103  
 USA

Telephone : +19058299500  
 Fax : +19058299292  
 Emergency Phone # (For both supplier and manufacturer) : 1-800-424-9300

Preparation Information : Sigma-Aldrich Corporation  
 Product Safety - Americas Region  
 1-800-521-8956

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

##### Target Organs

Liver, Kidney, Central nervous system, Blood

##### WHMIS Classification

D1A	Very Toxic Material Causing Immediate and	Highly toxic by ingestion
D2A	Serious Toxic Effects	Teratogen
D2B		Carcinogen
		Moderate skin irritant
		Moderate eye irritant
		Mutagen

##### GHS Classification

Acute toxicity, Oral (Category 2)  
 Skin irritation (Category 3)  
 Carcinogenicity (Category 2)  
 Reproductive toxicity (Category 2)  
 Specific target organ toxicity - repeated exposure, Inhalation (Category 2)  
 Chronic aquatic toxicity (Category 4)

##### GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H300	Fatal if swallowed.
H316	Causes mild skin irritation.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.

H413 May cause long lasting harmful effects to aquatic life.

Precautionary statement(s)  
 P264 Wash hands thoroughly after handling.  
 P281 Use personal protective equipment as required.  
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.

**HMIS Classification**

**Health hazard:** 3  
**Chronic Health Hazard:** \*  
**Flammability:** 0  
**Physical hazards:** 0

**Potential Health Effects**

**Inhalation** May be harmful if inhaled. Causes respiratory tract irritation.  
**Skin** May be harmful if absorbed through skin. Causes skin irritation.  
**Eyes** Causes eye irritation.  
**Ingestion** May be fatal if swallowed.

---

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Synonyms : N-[(3R)-(5-Chloro-8-hydroxy-3-methyl-1-oxo-7-isochromanyl)carbonyl]-L-phenylalanine

CAS-No.	EC-No.	Index-No.	Concentration
<b>(-)-Ochratoxin A</b>			
303-47-9	206-143-7	-	-
<b>Ethyl acetate</b>			
141-78-6	205-500-4	607-022-00-5	<= 2 %
<b>Petroleum ether, Bp 40 - 70°C</b>			
101316-46-5	309-852-0	-	<= 1 %

---

**4. FIRST AID MEASURES**

**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Flush eyes with water as a precaution.

**If swallowed**

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

---

**5. FIRE-FIGHTING MEASURES**

**Conditions of flammability**

Not flammable or combustible.

**Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for fire-fighters**

Wear self contained breathing apparatus for fire fighting if necessary.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx), Hydrogen chloride gas

**Explosion data - sensitivity to mechanical impact**

no data available

**Explosion data - sensitivity to static discharge**

no data available

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions**

Wear respiratory protection. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

**Methods and materials for containment and cleaning up**

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

**7. HANDLING AND STORAGE****Precautions for safe handling**

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

**Conditions for safe storage**

Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature: 2 - 8 °C

Keep in a dry place.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Update	Basis
Ethyl acetate	141-78-6	TWA	150 ppm	2006-11-29	Canada. British Columbia OEL
		TWAE V	400 ppm 1,440 mg/m <sup>3</sup>	2005-12-17	Canada. Ontario OELs
		TWA	400 ppm 1,440 mg/m <sup>3</sup>	2007-01-01	Canada. Alberta, Occupational Health and Safety Code (table 2: OEL)
Remarks	Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required				
		TWAE V	400 ppm 1,440 mg/m <sup>3</sup>	2006-12-29	Canada. Quebec OELs

**Personal protective equipment****Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Eye protection**

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin and body protection**

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**Specific engineering controls**

Use mechanical exhaust or laboratory fumehood to avoid exposure.

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**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

Form	powder
Colour	light yellow

**Safety data**

pH	no data available
Melting/freezing point	169.0 °C (336.2 °F)
Boiling point	no data available
Flash point	no data available
Ignition temperature	no data available
Autoignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Vapour pressure	no data available
Density	no data available
Water solubility	no data available
Partition coefficient: n-octanol/water	log Pow: 4.70
Relative vapour density	no data available
Odour	no data available
Odour Threshold	no data available
Evaporation rate	no data available

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**10. STABILITY AND REACTIVITY****Chemical stability**

Stable under recommended storage conditions.

**Possibility of hazardous reactions**

no data available

**Conditions to avoid**

no data available

**Materials to avoid**

Strong oxidizing agents

**Hazardous decomposition products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx), Hydrogen chloride gas

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**11. TOXICOLOGICAL INFORMATION****Acute toxicity****Oral LD50**

LD50 Oral - rat - 20.0 mg/kg

Remarks: Lungs, Thorax, or Respiration:Chronic pulmonary edema. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

**Inhalation LC50**

no data available

**Dermal LD50**

no data available

**Other information on acute toxicity**

no data available

**Skin corrosion/irritation**

no data available

**Serious eye damage/eye irritation**

no data available

**Respiratory or skin sensitization**

no data available

**Germ cell mutagenicity**

Laboratory experiments have shown mutagenic effects.

**Carcinogenicity**

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC: 2B - Group 2B: Possibly carcinogenic to humans ((-)-Ochratoxin A)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**Reproductive toxicity**

no data available

**Teratogenicity**

Laboratory experiments have shown teratogenic effects.

**Specific target organ toxicity - single exposure (Globally Harmonized System)**

no data available

**Specific target organ toxicity - repeated exposure (Globally Harmonized System)**

no data available

**Aspiration hazard**

no data available

**Potential health effects**

<b>Inhalation</b>	May be harmful if inhaled. Causes respiratory tract irritation.
<b>Ingestion</b>	May be fatal if swallowed.
<b>Skin</b>	May be harmful if absorbed through skin. Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.

**Signs and Symptoms of Exposure**

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**Synergistic effects**

no data available

**Additional Information**

RTECS: Not available

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**12. ECOLOGICAL INFORMATION**

**Toxicity**

no data available

**Persistence and degradability**

no data available

**Bioaccumulative potential**

no data available

**Mobility in soil**

no data available

**PBT and vPvB assessment**

no data available

**Other adverse effects**

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

no data available

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**13. DISPOSAL CONSIDERATIONS**

**Product**

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

**Contaminated packaging**

Dispose of as unused product.

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**14. TRANSPORT INFORMATION**

**DOT (US)**

UN-Number: 3462 Class: 6.1 Packing group: II  
Proper shipping name: Toxins, extracted from living sources, solid, n.o.s.  
Reportable Quantity (RQ): 250000 lbs  
Marine pollutant: No  
Poison Inhalation Hazard: No

**IMDG**

UN-Number: 3462 Class: 6.1 Packing group: II EMS-No: F-A, S-A  
Proper shipping name: TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S.  
Marine pollutant: No

**IATA**

UN-Number: 3462 Class: 6.1

Packing group: II

Proper shipping name: Toxins, extracted from living sources, solid, n.o.s.

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**15. REGULATORY INFORMATION****DSL Status**

This product contains the following components that are not on the Canadian DSL nor NDSL lists.

(-)-Ochratoxin A

CAS-No.  
303-47-9**WHMIS Classification**

D1A	Very Toxic Material Causing Immediate and	Highly toxic by ingestion
D2A	Serious Toxic Effects	Teratogen
D2B		Carcinogen
		Moderate skin irritant
		Moderate eye irritant
		Mutagen

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

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**16. OTHER INFORMATION****Further information**

Copyright 2010 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.



### TOXIN USE RISK ASSESSMENT

<b>Name of Toxin:</b>	Aflatoxin B1
<b>Proposed Use Dose:</b>	1000 µg
<b>Proposed Storage Dose:</b>	1000 µg
<b>LD<sub>50</sub> (species):</b>	9000 µg

<b>Calculation:</b>	
9000 µg/kg	x 50 kg/person
Dose per person based on LD <sub>50</sub> in µg = 450000	
<b>LD<sub>50</sub> per person with safety factor of 10 based on LD<sub>50</sub> in µg =</b>	<b>45000</b>

**Comments/Recommendations:**  
OK



**TOXIN USE RISK ASSESSMENT**

<b>Name of Toxin:</b>	Aflatoxin M1
<b>Proposed Use Dose:</b>	1000 µg
<b>Proposed Storage Dose:</b>	1000 µg
<b>LD<sub>50</sub> (species):</b>	300 µg

<b><u>Calculation:</u></b>			
	300 µg/kg	x	50 kg/person
	Dose per person based on LD <sub>50</sub> in µg = 15000		
	<b>LD<sub>50</sub> per person with safety factor of 10 based on LD<sub>50</sub> in µg =</b>		<b>1500</b>

**Comments/Recommendations:**  
OK



**TOXIN USE RISK ASSESSMENT**

<b>Name of Toxin:</b>	Ochratoxin A
<b>Proposed Use Dose:</b>	1000 µg
<b>Proposed Storage Dose:</b>	1000 µg
<b>LD<sub>50</sub> (species):</b>	20000 µg

<b><u>Calculation:</u></b>	
20000 µg/kg	x 50 kg/person
Dose per person based on LD <sub>50</sub> in µg = 1000000	
<b>LD<sub>50</sub> per person with safety factor of 10 based on LD<sub>50</sub> in µg = 100000</b>	

**Comments/Recommendations:**  
OK

# Questions

----- Original Message -----

**Subject:** Biological Agent Registry form - Reid lab

**Date:** Wed, 03 Nov 2010 15:40:29 -0400

**From:** Jennifer Stanley <[jstanle2@uwo.ca](mailto:jstanle2@uwo.ca)>

**To:** Wayne Miller <[wmiller5@uwo.ca](mailto:wmiller5@uwo.ca)>, Gregor Reid <[gregor@uwo.ca](mailto:gregor@uwo.ca)>

**CC:** Jeff Tucker <[Jeff.Tucker@sjhc.london.on.ca](mailto:Jeff.Tucker@sjhc.london.on.ca)>, Lesley Carmichael  
<[Lesley.Carmichael@sjhc.london.on.ca](mailto:Lesley.Carmichael@sjhc.london.on.ca)>

Hello there -

Thank you for your recent submission. It was discussed at the recent Biohazards Subcommittee meeting.

Please confirm that all of the list of biological agents in the lab are listed (or add agents as applicable).

There were no MSDS' provided for Atopobium or Gardnerella - please provide information (including species) and MSDS' if possible.

Clarification is needed on the amount of toxin being stored and handled at one time:

AMOUNT HANDLED - Is it < 1 mg for each toxin for <1 mg for all 3 toxins (total)?

AMOUNT STORED - Is it 1 mg for each toxin for <1 mg for all 3 toxins (total)?

Regards,  
Jennifer