

**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 Tianqing Peng  
 DEPARTMENT Critical Illness Research, Lawson Health Research Inst.  
 ADDRESS VRL, A6-140, 800 Commissioners Road, London  
 PHONE NUMBER 519-685-8500 x 55441  
 EMERGENCY PHONE NUMBER(S) 519-471-0822  
 EMAIL tpeng2@uwo.ca

Location of experimental work to be carried out: Building(s) VRL, 6th Floor Room(s) A6-120

\*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: CIHR and HSFO  
 GRANT TITLE(S): Role of calpain activation in myocardial dysfunction in sepsis;  
Targeting mitochondrial ROS to prevent myocardial dysfunction in sepsis;  
Transformation of normal to abnormal myocardium by diabetes - Role of Raey and calpain.

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>Yixin Yang</u>	<u>yyang348@uwo.ca</u>	<u>Aug. 3, 2010</u>
<u>Amina Iftikhar</u>	<u>aiftikhar@uwo.ca</u>	<u>Aug 3, 2010</u>
<u>Manpreet Singh</u>	<u>msingh57@uwo.ca</u>	<u>Aug 3, 2010</u>
<u>Yanpeng Wang</u>	<u>ywang869@uwo.ca</u>	<u>Aug 3, 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.

- 1) Adenoviruses: they are recombinant  $E_1$ -deleted adenoviral vectors containing different genes. they are replication-deficient and used to treat cells. Certified biological safety cabinet and tissue culture room (level-2) will be used. UV light exposure will be used for cabinet. Autoclaves and 1% Virkon will be used for decontamination and sterilization. finally biomedical waste container will be used for disposal.
- 2) Bacteria: DH52 is an engineering bacterium, which is used to amplify DNA only. Autoclaves and 1% Virkon will be used for decontamination and sterilization. Certified B Level-2 room will be used and biomedical waste container will be used for disposal.
- 3) Approved cells: Rodent primary cardiomyocytes and Human HepG2 certified biological safety cabinet and tissue culture room will be used. Biomedical waste container will be used for disposal.
- 4) Animals: mice.
- 5) Lipopolysaccharide: It is a component of gram-negative bacteria. We use it to treat cultured cells and mice to mimic human conditions of sepsis. It will be stored in level-2 room. Biomedical waste container will be used for disposal.

Please include a one page research summary or teaching protocol.

**Research Summary:**

The primary research involves the understanding of the mechanisms of myocardial dysfunction. We utilize a wide range of approaches ranging from cellular, molecular biology to in vivo physiology. Cultured cardiomyocytes and isolated whole hearts are used to study the molecular mechanisms of myocardial dysfunction and the role of key genes/proteins in this process. To assess the physiological significance of each of the molecules, related knockout or transgenic and wild-type animals are employed.

Current research is focused on sepsis-induced myocardial dysfunction. We study the signal transduction mechanisms in cultured cardiomyocytes in response to lipopolysaccharide, an important pathogen for sepsis, and the regulation of myocardial injuries in animal model of sepsis. A variety of approaches including gene silencing and over-expression will be used to investigate the role of gene of interest.

Another research is focused on diabetic cardiomyopathy. We are investigating the molecular mechanisms of hyperglycemia-induced cardiomyocyte injuries and developing the therapeutical strategies to protect the heart from injury as the heart has limited ability to regenerate its damaged tissue. The models of this study include cultured cardiomyocytes and various diabetic mice.

## 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
Adenoviruses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1 mL	Applied Biological materials Inc	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3
Bacteria E. coli DH52	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1-2 Litres	Luvitrogen	<input type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3
	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No			<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3

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

## 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Not applicable
Rodent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Heart	2008-079 2007-111-12
Non-human primate	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		2009-073
Other (specify)	<input type="checkbox"/> 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="radio"/> Yes <input checked="" type="radio"/> No	HEK 293 cells	Human embryonic kidney
Rodent	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Non-human primate	<input type="radio"/> Yes <input checked="" type="radio"/> No		
Other (specify)	<input type="radio"/> Yes <input checked="" type="radio"/> 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		<input type="radio"/> Yes <input type="radio"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
Human Blood (fraction) or other Body Fluid		<input type="radio"/> Yes <input type="radio"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
Human Organs or Tissues (unpreserved)		<input type="radio"/> Yes <input type="radio"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 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> DH5 $\alpha$ bacteria	pMLK-report	Ambion	Human Sirt1 3'UTR	No changes

\* 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
Adenovirus	Ad-CAST	Applied Biological Materials Inc.	Rgt Calpastatin	no changes

\* 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 E1A \_\_\_\_\_  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

## 8.0 Biological Toxins

8.1 Will toxins of biological origin be used?  YES  NO If no, please proceed to Section 9.0

8.2 If YES, please name the toxin(s) Lipopolysaccharide  
Please attach information, such as a Material Safety Data Sheet, for the toxin(s) used.

8.3 What is the LD<sub>50</sub> (specify species) of the toxin 7.67 mg/Kg, mouse (I.V.)

8.4 How much of the toxin is handled at one time\*? 10 µg ~ 1 mg

8.5 How much of the toxin is stored\*? 10 mg

8.6 Will any biological toxins be used in live animals?  YES, Please provide details: 4mg/Kg single dose. i.p.  NO

\*For information on biosecurity requirements, please see:

[http://www.uwo.ca/humanresources/docandform/docs/healthandsafety/biosafety/Biosecurity\\_Requirements.pdf](http://www.uwo.ca/humanresources/docandform/docs/healthandsafety/biosafety/Biosecurity_Requirements.pdf)

## 9.0 Insects

9.1 Do you use insects?  YES  NO If no, please proceed to Section 10.0

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

9.3 What is the origin of the insect? \_\_\_\_\_

9.4 What is the life stage of the insect? \_\_\_\_\_

9.5 What is your intention?  Initiate and maintain colony, give location: \_\_\_\_\_  
 "One-time" use, give location: \_\_\_\_\_

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

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

9.7 Do you use insects that require a permit from the CFIA permit?  YES  NO  
If YES, Please attach the CFIA permit & describe any CFIA permit conditions:

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

10.0 Plants

10.1 Do you use plants?  YES  NO If no, please proceed to Section 11.0

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

10.3 What is the origin of the plant? \_\_\_\_\_

10.4 What is the form of the plant (seed, seedling, plant, tree...)? \_\_\_\_\_

10.5 What is your intention?  Grow and maintain a crop  "One-time" use

10.6 Do you do any modifications to the plant?  YES  NO  
If yes, please describe: \_\_\_\_\_  
\_\_\_\_\_

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

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

11.0 Import Requirements

11.1 Will any of the above agents be imported?  YES, please give country of origin USA  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

*Certified by  
Gail Ryder  
Maire Ryan*

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 *[Signature]* Date: \_\_\_\_\_

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:

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

**See E-mail**

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: *Maire Ryan*  
Date: August 13, 2010

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

Special Conditions of Approval:



## Chemical Material Safety Data Sheet

Product: Ad-Adenovirus 5  
Cat. #: 000013A

Date Updated: June 24<sup>th</sup>, 2010

Date Printed: August 6<sup>th</sup>, 2010

### Section 1: Product and Company Information

**Product Name:** Ad-Adenovirus 5  
**Cat. No.:** 000013A  
**Company:** ABM Inc.  
**Address:** #8-13520 Crestwood Place  
 Richmond, BC V6V2G2  
**Phone:** 604-247-2416  
**Fax:** 604-247-2414  
**Emerg. Phone:** 866-757-2414

### Section 2: Composition and Information on Ingredients

**Substance Name:** Adenovirus Product  
**CAS Number:** None  
**SARA 313:** No

**Ingredient Name:** Ad-Adenovirus 5  
**CAS Number:** None  
**SARA 313:** No  
**Percent:** 0.0001

**Ingredient Name:** Dulbecco's Modified Eagle's Medium (Solution)  
**CAS Number:** None  
**SARA 313:** No  
**Percent:** 89.9999

**Ingredient Name:** Fetal Bovine Serum, Manufacturing Use  
**CAS Number:** None  
**SARA 313:** No  
**Percent:** 10.0

### Section 3: Hazard Identification

#### Emergency Overview

#### HMIS Classification

**Health Hazard:** 0  
**Reactivity:** 0  
**Flammability:** 0

#### NFPA Classification

**Health Hazard:** 0  
**Reactivity:** 0  
**Flammability:** 0

For additional information on toxicity, please refer to Section 11.

### Section 4: First Aid Measures

#### Eye Contact

Rinse thoroughly with plenty of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Consult a physician.

#### Skin Contact

Wash off with soap and plenty of water. Consult a physician.

**Inhalation**

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

**Ingestion**

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

**Section 5: Fire Fighting Measures****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.

**Section 6: Accidental Release Measures****Personal Precautions**

Exercise appropriate precautions to minimize direct contact with skin or eyes, and prevent inhalation of dust.

**Methods for Cleaning up**

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

**Section 7: Handling and Storage****Handling**

User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

**Storage**

Suitable: Keep tightly closed.

Store at -70C

**Section 8: Exposure Controls and PPE****Engineering Controls**

Safety shower and eye bath. Mechanical exhaust required.

**Personal Protective Equipment****Respiratory:**

Use respirators and components tested and approved under appropriate government standards, such as NIOSH (USA) or CEN (EU). Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (USA) or Type P1 (EN143) dust masks.

**Hand:**

Protective gloves.

**Eye:**

Chemical safety goggles.

**General Hygiene Measures**

Wash thoroughly after handling.

**Section 9: Physical and Chemical Properties**

N/A

**Section 10: Stability and Reactivity****Stability**

Stable.

**Materials to Avoid:**

Strong oxidizing agents.

**Hazardous Decomposition Products**

Nature of decomposition products not known.

**Hazardous Polymerization**

Will not occur.

**Section 11: Toxicological Information****Route of Exposure**

Skin Contact: May cause irritation.

Skin: May be harmful if absorbed through skin.

Absorption:

Eye Contact: May cause eye irritation.

Ingestion: May be harmful if swallowed.

Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.

**Signs and Symptoms of Exposure**

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

**Section 12: Ecological Information**

N/A

**Section 13: Disposal Considerations**

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. Observe all federal, state/provincial, and local environment regulations.

**Section 14: Transport Information****DOT**

Proper Shipping Name: None

This substance is considered to be non-hazardous for transport.

**IATA**

This substance is considered to be non-hazardous for air transport.

**Section 15: Regulatory Information****United States Regulatory Information**

SARA LISTED: No

**Canada Regulatory Information**

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: No

**Section 16: Other Information**

The information contained in this Material Safety Data Sheet is believed to be accurate, but it is the responsibility of the user or supplier to determine the applicability of these data to the formulation of necessary safety precautions.

Applied Biological Materials Inc. shall not be held responsible for any damage resulting from the use of the above information contained in this Material Safety Data Sheet.

**1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING**

Product code 18265017  
 Product name Subcloning Efficiency™ DH5alpha™ Competent Cells

**Company/Undertaking Identification**

INVITROGEN CORPORATON  
 5791 VAN ALLEN WAY  
 PO BOX 6482  
 CARLSBAD, CA 92008  
 760-603-7200

INVITROGEN CORPORATION  
 5250 MAINWAY DRIVE  
 BURLINGTON, ONT  
 CANADA L7L 6A4  
 800-263-6236

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

24 hour Emergency Response 866-536-0631  
 (Transport): 301-431-8585  
 Outside of the U.S. ++1-301-431-8585

For research use only

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

**Hazardous/Non-hazardous Components**

The product contains no substances which at their given concentration, are considered to be hazardous to health. We recommend handling all chemicals with caution.

**3. HAZARDS IDENTIFICATION**

**Emergency Overview**

The product contains no substances which at their given concentration, are considered to be hazardous to health

### 3. HAZARDS IDENTIFICATION

Form  
Liquid

#### Principle Routes of Exposure/ Potential Health effects

Eyes	No information available
Skin	No information available
Inhalation	No information available
Ingestion	May be harmful if swallowed.

#### Specific effects

Carcinogenic effects	No information available
Mutagenic effects	No information available
Reproductive toxicity	No information available
Sensitization	No information available

Target Organ Effects No information available

#### HMIS

Health	0
Flammability	0
Reactivity	0

### 4. FIRST AID MEASURES

<b>Skin contact</b>	Wash off immediately with plenty of water. If symptoms persist, call a physician.
<b>Eye contact</b>	Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.
<b>Ingestion</b>	Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
<b>Inhalation</b>	Move to fresh air. If symptoms persist, call a physician.
<b>Notes to physician</b>	Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

<b>Suitable extinguishing media</b>	Dry chemical
<b>Special protective equipment for firefighters</b>	Wear self-contained breathing apparatus and protective suit

### 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	Use personal protective equipment
<b>Methods for cleaning up</b>	Soak up with inert absorbent material.

### 7. HANDLING AND STORAGE

<b>Handling</b>	No special handling advice required
<b>Storage</b>	Keep in properly labelled containers

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Occupational exposure controls

#### Exposure limits

Engineering measures                      Ensure adequate ventilation, especially in confined areas

#### Personal protective equipment

Respiratory Protection                      In case of insufficient ventilation wear suitable respiratory equipment

Hand protection

Protective gloves

Eye protection

Safety glasses with side-shields

Skin and body protection

Lightweight protective clothing.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls

Prevent product from entering drains.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### General Information

Form

Liquid

### Important Health Safety and Environmental Information

Boiling point/range

°C No data available

°F No data available

Melting point/range

°C No data available

°F No data available

Flash point

°C No data available

°F No data available

Autoignition temperature

°C No data available

°F No data available

Oxidizing properties

No information available

Water solubility

No data available

## 10. STABILITY AND REACTIVITY

Stability

Stable.

Materials to avoid

No information available

Hazardous decomposition products

No information available

Polymerization

Hazardous polymerisation does not occur.

## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Principle Routes of Exposure/

#### Potential Health effects

Eyes

No information available

Skin

No information available

Inhalation

No information available

Ingestion May be harmful if swallowed.

<b>Specific effects</b>	<b>(Long Term Effects)</b>
Carcinogenic effects	No information available
Mutagenic effects	No information available
Reproductive toxicity	No information available
Sensitization	No information available

**Target Organ Effects** No information available

## 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity effects</b>	No information available.
<b>Mobility</b>	No information available.
<b>Biodegradation</b>	Inherently biodegradable.
<b>Bioaccumulation</b>	Does not bioaccumulate.

## 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

## 14. TRANSPORT INFORMATION

### IATA

<b>Proper shipping name</b>	Not classified as dangerous in the meaning of transport regulations
<b>Hazard Class</b>	No information available
<b>Subsidiary Class</b>	No information available
<b>Packing group</b>	No information available
<b>UN-No</b>	No information available

## 15. REGULATORY INFORMATION

### International Inventories

### U.S. Federal Regulations

#### **SARA 313**

This product is not regulated by SARA.

#### **Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)**

This product does not contain HAPs.

### U.S. State Regulations

#### **California Proposition 65**

This product does not contain chemicals listed under Proposition 65

### WHMIS hazard class:

Non-controlled

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR

## **16. OTHER INFORMATION**

For research use only

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 the Company 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, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

**End of Safety Data Sheet**

## MATERIAL SAFETY DATA SHEET

Date Printed: 09/24/2009  
Date Updated: 05/07/2009  
Version 1.4

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Section 1 - Product and Company Information

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Product Name LIPOPOLYSACCHARIDE FROM SALMONELLA  
TYPHOSA PHENOL EXTRACT  
Product Number L6386  
Brand SIGMA  
Company Sigma-Aldrich Canada, Ltd  
Address 2149 Winston Park Drive  
Oakville ON L6H 6J8 CA  
Technical Phone: 9058299500  
Fax: 9058299292  
Emergency Phone: 800-424-9300

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Section 2 - Composition/Information on Ingredient

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Substance Name	CAS #	SARA 313
LIPOPOLYSACCHARIDE FROM SALMONELLATYPHOSAPHENOL EXTRACT	None	No

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Section 3 - Hazards Identification

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## EMERGENCY OVERVIEW

Harmful.

Pyrogen. May cause fever. Do not use if skin is cut or scratched.  
Wash thoroughly after handling.

For additional information on toxicity, please refer to Section 11.

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Section 4 - First Aid Measures

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## ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is  
conscious. Call a physician.

## INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult,  
call a physician.

## DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for  
at least 15 minutes. Remove contaminated clothing and shoes.  
Call a physician.

## EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of  
water for at least 15 minutes. Assure adequate flushing by  
separating the eyelids with fingers. Call a physician.

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Section 5 - Fire Fighting Measures

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FLASH POINT

N/A

AUTOIGNITION TEMP

N/A

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

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Section 7 - Handling and Storage

STORAGE

Store at 2-8°C

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Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

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Section 9 - Physical/Chemical Properties

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pH	N/A
BP/BP Range	N/A
MP/MP Range	N/A
Freezing Point	N/A
Vapor Pressure	N/A
Vapor Density	N/A
Saturated Vapor Conc.	N/A
Bulk Density	N/A
Odor Threshold	N/A
Volatile%	N/A
VOC Content	N/A
Water Content	N/A
Solvent Content	N/A
Evaporation Rate	N/A

Viscosity	N/A
Surface Tension	N/A
Partition Coefficient	N/A
Decomposition Temp.	N/A
Flash Point	N/A
Explosion Limits	N/A
Flammability	N/A
Autoignition Temp	N/A
Refractive Index	N/A
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	N/A

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Multiple Routes: May be harmful by inhalation, ingestion, or skin absorption.

### CONDITIONS AGGRAVATED BY EXPOSURE

The toxicological properties have not been thoroughly investigated.

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## Section 12 - Ecological Information

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No data available.

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## Section 13 - Disposal Considerations

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### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

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## Section 14 - Transport Information

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### DOT

Proper Shipping Name: None  
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

### IATA

Non-Hazardous for Air Transport: Non-hazardous for air transport.

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## Section 15 - Regulatory Information

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EU ADDITIONAL CLASSIFICATION  
Symbol of Danger: Xn  
Indication of Danger: Harmful.

US CLASSIFICATION AND LABEL TEXT  
Indication of Danger: Harmful.  
US Statements: Pyrogen. May cause fever. Do not use if skin is cut or scratched. Wash thoroughly after handling.

UNITED STATES REGULATORY INFORMATION  
SARA LISTED: No

CANADA REGULATORY INFORMATION  
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.  
DSL: No  
NDSL: No

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Section 16 - Other Information

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DISCLAIMER  
For R&D use only. Not for drug, household or other uses.

WARRANTY  
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 Inc., 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.  
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Email (Section  
14.0)

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

**Subject:**Re: Biological Agents Registry Form: Peng

**Date:**Tue, 12 Oct 2010 11:18:30 -0400

**From:**Tianqing Peng <tpeng2@uwo.ca>

**To:**Jennifer Stanley <jstanle2@uwo.ca>

Thanks. Here are the answers for them:

14.2. Glasses, gloves, and lab coat will be used. Mix solution and handle agents in the fumehood. Educate staff regarding the risk.

14.3. Get first aid immediately if needed for emergency treatment. Report injury to workplace safety & Insurance board if needed.

Please let me know if further information is required!

Tianqing