**THE UNIVERSITY OF WESTERN ONTARIO**
**BIOHAZARDOUS AGENTS REGISTRY FORM**
**Approved Biohazards Subcommittee: September 25, 2009**
**Biosafety Website: www.uwo.ca/humanresources/biosafety/**

This form must be completed by each Principal Investigator holding a grant administered by the University of Western Ontario or in charge of a laboratory/facility where the use of Level 1, 2 or 3 biohazardous 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 biohazards 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, 1st 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 Biohazard Subcommittee. For questions regarding this form, please contact the Biosafety Officer at extension 81135 or 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

| | |
|---|---|
| PRINCIPAL INVESTIGATOR | Jun Yang |
| SIGNATURE | |
| DEPARTMENT | Mechanical and Materials Engineering |
| ADDRESS | SEB 3089 |
| PHONE NUMBER | ext. 80158 |
| EMERGENCY PHONE NUMBER(S) | |
| EMAIL | jyang@eng.uwo.ca |

Location of experimental work to be carried out: Building(s) SEB Room(s) 3074

*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 12.0, Approvals).

FUNDING AGENCY/AGENCIES: NSERC, CIHR, OCE, UWO, MRI
GRANT TITLE(S): Blood-on-a-chip; multiscale transport phenomena in microcirculation; Biophysical studies of alpha4Beta1 integrin-ligand interactions at a single molecule level and a single cell level; Microfluidics meets Microbiology

**PLEASE ATTACH A BRIEF DESCRIPTION OF YOUR WORK THAT EXPLAINS THE BIOHAZARDS USED AND HOW THEY WILL BE USED. PROJECTS SUBMITTED WITHOUT A SUMMARY WILL NOT BE REVIEWED. A GRANT SUMMARY PAGE MAYBE ADEQUATE IF IT PROVIDES SUFFICIENT DETAIL ABOUT EACH BIOHAZARD USED.**

Names of all personnel working under Principal Investigators supervision in this location:

Nour Gjonaim
Binyu Yu
Qiuquan Guo
Tingjie Li

*** DESCRIPTION MUST BE ATTACHED TO THIS FORM OR PROJECT WILL NOT BE REVIEWED***

## 1.0 Microorganisms

1.1 Does your work involve the use of biological agents? Ø YES O NO
(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? Ø YES O NO
If YES, please give the name of the species. E. Coli, S. aureus
What is the origin of the microorganism(s)? Cedarlane
Please describe the risk (if any) of escape and how this will be mitigated:
~~No risk they are~~ The risk is low. all experiments are conducted in Biosafety level 2 lab. &

Please attach the CFIA permit. Attached at the end
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 |
|---|---|---|---|---|---|---|
| E. coli | Ø Yes O No | Ø Yes O No | O Yes O No | 0.1 L | Cedarlane | O 1 Ø 2 O 3 |
| S. aureus | Ø Yes O No | Ø Yes O No | Ø Yes O No | 0.1 L | Cedarlane | O 1 Ø 2 O 3 |
| | O Yes O No | O Yes O No | O Yes O No | | | O 1 O 2 O 3 |
| | O Yes O No | O Yes O No | O Yes O No | | | O 1 O 2 O 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? Ø YES O 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 | Ø Yes O No | Endothelial cells from Lonza | Not applicable |
| Rodent | O Yes Ø No | | |
| Non-human primate | O Yes Ø No | | |
| Other (specify) | O Yes Ø 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 | ✓ Yes O No | endothelial cell line from Lonza | Lonza |
| Rodent | O Yes ✓ No | | |
| Non-human primate | O Yes ✓ No | | |
| Other (specify) | O Yes ✓ No | | |

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

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

**3.0 Use of Human Source Materials**

3.1 Does your work involve the use of human source materials? ✓ YES O 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 | | ✓ Yes O No O Unknown | | O 1 ✓ 2 O 3 |
| Human Blood (fraction) or other Body Fluid | | O Yes ✓ No O Unknown | | O 1 O 2 O 3 |
| Human Organs or Tissues (unpreserved) | | O Yes ✓ No O Unknown | | O 1 O 2 O 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? O YES ✓ NO If no, please proceed to Section 5.0

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

| Bacteria Used for Cloning * | Plasmid(s) * | Source of Plasmid | Gene Transfected | Describe the change that results |
|---|---|---|---|---|
| | | | | |

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

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

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

* Please attach a Material Safety Data Sheet or equivalent.

4.4 Will genetic sequences from the following be involved?

- HIV O YES, please specify _____ O NO
- HTLV 1 or 2 or genes from any Level 1 or Level 2 pathogens O YES, specify _____ O NO
- SV 40 Large T antigen O YES O NO
- E1A oncogene O YES O NO
- Known oncogenes O YES, please specify _____ O NO
- Other human or animal pathogen and or their toxins O YES, please specify _____ O NO

4.5 Will virus be replication defective? O YES O NO

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

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

**5.0 Human Gene Therapy Trials**

5.1 Will human clinical trials be conducted involving a biological agent? O YES ✓O 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? O YES O 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? O YES, number: _____ O NO O PENDING

**6.0 Animal Experiments**

6.1 Will live animals be used? O YES ✓O 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 O YES, specify: _____ O NO

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

_____

_____

*** DESCRIPTION MUST BE ATTACHED TO THIS FORM OR PROJECT WILL NOT BE REVIEWED***

## 7.0 Use of Animal species with Zoonotic Hazards

7.1 Will any of the following animals or their organs, tissues, lavages or other body fluids including blood be used?

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

## 8.0 Biological Toxins

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

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

8.3 What is the $LD_{50}$ (specify species) of the toxin_____

8.4 How much of the toxin is handled at one time*? _____

8.5 How much of the toxin is stored*? _____

8.6 Will any biological toxins be used in live animals? O YES, Please provide detais:_____ O NO

*For information on biosecurity requirements, please see:
http://www.uwo.ca/humanresources/docandform/docs/healthandsafety/biosafety/Biosecurity_Requirements.pdf

## 9.0 Insects Requiring CFIA Permits

9.1 Do you use insects that require a permit from the CFIA? O YES O 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? O Initiate and maintain colony, give location: _____
O "One-time" use, give location: _____

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

9.7 Please attach the CFIA permit.

9.8 Please describe any CFIA permit conditions:
_____
_____

*** DESCRIPTION MUST BE ATTACHED TO THIS FORM OR PROJECT WILL NOT BE REVIEWED***

**10.0 Plants Requiring CFIA Permits**

10.1 Do you use plants that require a permit from the CFIA? O YES ✓O 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? O Grow and maintain a crop O "One-time" use

10.6 Do you do any modifications to the plant? O YES O 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? O YES O NO
If NO, please forward the permit to he Biosafety Officer when available.

10.9 Please describe any CFIA permit conditions:
_____
_____
_____

**11.0 Import Requirements**

11.1 Will any of the above agents be imported? O YES, please give country of origin_____
If no, please proceed to Section 12.0 ✓O NO

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

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

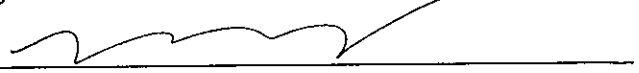
11.4 Has the import permit been sent to OHS? O YES, please provide permit # _____ O NO

**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 biohazardous agents in Sections 1.0 to 9.0 have been trained.

SIGNATURE 

*** DESCRIPTION MUST BE ATTACHED TO THIS FORM OR PROJECT WILL NOT BE REVIEWED***

**13.0 Containment Levels**

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

13.2 Has the facility been certified by OHS for this level of containment?

☑ YES, permit # if on-campus Bio-UWO-0149

O NO, please certify

O 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 _____ Date: N. Dec. 2. 2009

14.2 Please describe additional risk reduction measures will be taken beyond containment level 1, 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 biohazards listed, such as a needlestick injury:

As ~~staff~~ required by UWO biosafety procedure

_____

**15.0 Approvals**

UWO Biohazard Subcommittee: SIGNATURE: _____
Date: _____

Safety Officer for Institution where experiments will take place: SIGNATURE: _____
Date: _____

Safety Officer for University of Western Ontario (if different from above): SIGNATURE: _____
Date: _____

Approval Number: _____ Expiry Date (3 years from Approval): _____

Special Conditions of Approval:

*** DESCRIPTION MUST BE ATTACHED TO THIS FORM OR PROJECT WILL NOT BE REVIEWED***

Public Health Agency of Canada
Agence de la santé publique du Canada

**Office of Laboratory Security**
**Bureau de sécurité des laboratoires**

**Centre for Emergency Preparedness and Response**
**Centre de mesures et d'interventions d'urgence**
**100 chemin Colonnade Road, Loc.: 6201A**
**Ottawa, Ontario, Canada K1A 0K9**

WHO Collaborating Centre for Biosafety

Centre collaborateur OMS pour les techniques de biosécurité

**Fax: (613) 941-0596** **Tel: (613) 957-1779**

**DATE**_____ **FROM / DE :** Marianne Heisz

**TO / À :** **Jun Yang & Edmond Leung**
University of Western Ontario
Mechanical & Materials Engineering

**FAX:** 519 - 661-3020 **TEL:** 519 - 661-2111 x. 80158 **PAGES TO FOLLOW / PAGES À SUIVRE :** 1

***COMMENTS - COMMENTAIRES***

| | |
|---|---|
| Please see attached a letter for your attention.<br><br>Original will follow through regular mail.<br><br>Thank you. | Vous trouverez sous pli une lettre à votre attention.<br><br>La copie originale suivra par le courrier régulier.<br><br>Merci |

Public Health Agency of Canada / Agence de la santé publique du Canada

Your file / Votre référence

Our file / Notre référence

**Canadian end-user compliance with the *Laboratory Biosafety Guidelines, 3rd Ed., 2004***

This letter serves to confirm that the Office of Laboratory Security has reviewed a Containment Level 2 checklist for the facility identified below, and found the information submitted acceptable.

| | |
|---|---|
| **Organization:** | University of Western Ontario<br>Mechanical & Materials Engineering |
| **Attention:** | Jun Yang & Edmond Leung |
| **Address:** | 1151 Richmond Street N. SEB 3088<br>London, ON<br>N6A 5B9 |
| **Laboratory Room Number(s):** | SEB 3074 |
| **Type of work:** | ☒ *in vitro* only<br>☐ *in vitro* and *in vivo** |
| **Compliance Letter expiry date:** | NOVEMBER 1 5, 2010 |

To renew your compliance letter please complete a CL2 checklist and fax it to our office at (613) 941-0596. The checklist can be obtained from the following website: www.phac-aspc.gc.ca/ols-bsl/pathogen/index.html

Should you have any questions regarding this letter, please do not hesitate to contact our office at (613) 957-1779.

Sincerely,

Marianne Heisz
Chief, Importation and Regulatory Affairs

OCTOBER 2 7, 2008
Date

*The Office of Laboratory Security must be contacted prior to initiating any work involving domestic animals including poultry, cattle, sheep, swine and horses.

Canada

------- Original Message -------
**Subject:**[Fwd: RE: Biohazardous Agents Registry Form: Yang]
**Date:**Tue, 08 Dec 2009 15:25:45 -0500
**From:**Jennifer Stanley <jstanle2@uwo.ca>
**To:**Jennifer Stanley <jstanle2@uwo.ca>

-------- Original Message --------
Subject: RE: Biohazardous Agents Registry Form: Yang
Date: Tue, 08 Dec 2009 14:34:53 -0500
From: Jun Yang <jyang237@uwo.ca>
To: 'Jennifer Stanley' <jstanle2@uwo.ca>
References: <4B1D4561.6080609@uwo.ca>
<A1AA2B9FC03E46029B71E8DD02A7FCB0@Bionano> <4B1D6944.7070006@uwo.ca>
<fc17e2b71e5f2.4b1e4ae6@uwo.ca>

Hi, Jennifer:

I think you can use the enclosed MSDS since endothelial cell lines are similar from one company to another.

Regarding blood, sorry I made a mistake. The blood is not infected, which is from health donors.

Best regards!

Jun

---

*From:* Jennifer Stanley [mailto:jstanle2@uwo.ca]
*Sent:* 2009年12月8日 12:48 PM
*To:* Jun Yang
*Subject:* Re: Biohazardous Agents Registry Form: Yang

Hi Dr. Yang

Perhaps if you give me the exact cell line name I will be able to find it on the Lonza site?

Also, I noticed on Table 3.2 that you are using human blood that is infected...can you tell me what it is infected with?

Regards

Jennifer

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## Product Description

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### Bacteria

| | | | |
|---|---|---|---|
| **ATCC® Number:** | **33807™** Order this Item | **Price:** | **$240.00** |
| **Organism:** | *Staphylococcus aureus* subsp. *aureus* Rosenbach | | **Related Links** |
| **Designations:** | D0318 | | NCBI Entrez Search |
| **Isolation:** | clinical isolate | | Make a Deposit |
| **Depositor:** | JC Feeley | | Frequently Asked Questions |
| **History:** | ATCC <<--JC Feeley<<--Wisconsin State Hlth. Dept | | Material Transfer Agreement |
| Biosafety Level: | 2 | | Technical Support |
| **Shipped:** | freeze-dried | | Related Products |
| **Growth Conditions:** | ATCC medium3: Nutrient agar or nutrient broth<br>**Temperature:** 37.0°C | | |
| **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. | | |
| **Comments:** | Does not produce pyrogenic exotoxin C | | |

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All prices are listed in U.S. dollars and are subject to change without notice. A discount off the current list price will be applied to most cultures for nonprofit institutions in the United States. Cultures that are ordered as test tubes or flasks will carry an additional laboratory fee. Fees for permits, shipping, and handling may apply.
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### Bacteria

**ATCC® Number:** 29425™ Order this Item
**Price:** $195.00

**Organism:** *Escherichia coli* (Migula) Castellani and Chalmers
**Designations:** K12
**Isolation:** Basel, 1969 [185139]
**Depositor:** R Yuan
**History:** ATCC <<--R Yuan<<--W. Arber
Biosafety Level: 1
**Shipped:** frozen
**Growth Conditions:** ATCC medium3: Nutrient agar or nutrient broth
**Temperature:** 37.0°C
Duration: aerobic
**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.
**References:** 185139: R Yuan, personal communication

**Related Links**
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invitrogen

# Material Safety Data Sheet

**Revision Date:** 10-Jul-2007

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

**Product code** C0065C
**Product name** HAEC, 500,000 cells/vial

**Company/Undertaking Identification**

INVITROGEN CORPORATON
1600 FARADAY AVENUE
PO BOX 6482
CARLSBAD, CA 92008
760-603-7200

INVITROGEN CORPORATION
3 FOUNTAIN DRIVE
INCHINNAN BUSINESS PARK
PAISLEY, PA4 9RF
SCOTLAND
011 44 141 814 6100

INVITROGEN CORPORATION
2270 INDUSTRIAL STREET
BURLINGTON, ONT
CANADA L7P 1A1
1-800-263-6236

CASCADE BIOLOGICS
INVITROGEN CORPORATION
1341 S.W. CUSTER DRIVE
PORTLAND, OR 97219
++1 503-292-9521
++1 800-778-4770

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

**Hazardous/Non-hazardous Components**

| Chemical Name | CAS-No | Weight % |
|---|---|---|
| dimethylsulfoxide | 67-68-5 | 7-13 |

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

## 3. HAZARDS IDENTIFICATION

## 3. HAZARDS IDENTIFICATION

**Emergency Overview**

Components of the product may be absorbed into the body through the skin

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

**Form**

Suspension

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

| | |
|---|---|
| **Eyes** | Mild eye irritation. |
| **Skin** | Moderate skin irritation. Components of the product may be absorbed into the body through the skin. |
| **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 | 1 |
| Flammability | 0 |
| Reactivity | 0 |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **Skin contact** | Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. |
| **Eye contact** | Rinse thoroughly with plenty of water, also under the eyelids. |
| **Ingestion** | Rinse mouth. |
| **Inhalation** | Move to fresh air |
| **Notes to physician** | Treat symptomatically |

## 5. FIRE-FIGHTING MEASURES

| | |
|---|---|
| **Suitable extinguishing media** | Water spray. Carbon dioxide (CO2). Foam. Dry powder. alcohol-resistant foam. The product is not flammable. |
| **Special protective equipment for firefighters** | Wear self-contained breathing apparatus and protective suit |

## 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Personal precautions** | Use personal protective equipment |
| **Methods for cleaning up** | Soak up with inert absorbent material. Clean contaminated surface thoroughly. Take up mechanically and collect in suitable container for disposal. |

## 7. HANDLING AND STORAGE

**Handling** Avoid contact with skin and eyes.
**Storage** Keep in properly labelled containers.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls

Exposure limits

| Chemical Name | OSHA PEL (TWA) | OSHA PEL (Ceiling) | ACGIH OEL (TWA) | ACGIH OEL (STEL) |
|---|---|---|---|---|
| dimethylsulfoxide | - | - | - | - |

**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** Suspension

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** | soluble | |

## 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

| Chemical Name | LD50 (oral,rat/mouse) | LD50 (dermal,rat/rabbit) | LC50 (inhalation,rat/mouse) |
|---|---|---|---|
| dimethylsulfoxide | 14500 mg/kg (Rat) | No data available | No data available |

Principle Routes of Exposure/
Potential Health effects

| | |
|---|---|
| **Eyes** | Mild eye irritation. |
| **Skin** | Moderate skin irritation. Components of the product may be absorbed into the body through the skin. |
| **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

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Ecotoxicity effects** | No information available. |
| **Mobility** | No information available. |
| **Biodegradation** | Inherently biodegradable. |
| **Bioaccumulation** | Does not bioaccumulate. |

## 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

## 14. TRANSPORT INFORMATION

IATA

| | |
|---|---|
| **Proper shipping name** | Not classified as dangerous in the meaning of transport regulations |
| **Hazard Class** | No information available |
| **Subsidiary Class** | No information available |
| **Packing group** | No information available |
| **UN-No** | No information available |

## 15. REGULATORY INFORMATION

International Inventories

| Chemical Name | TSCA | PICCS | ENCS | DSL | NDSL | AICS |
|---|---|---|---|---|---|---|
| dimethylsulfoxide | Listed | Listed | Listed | Listed | - | Listed |

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 contains HAPs.

## U.S. State Regulations

| Chemical Name | Massachusetts - RTK | New Jersey - RTK | Pennsylvania - RTK | Illinois - RTK | Rhode Island - RTK |
|---|---|---|---|---|---|
| dimethylsulfoxide | - | - | - | - | - |

### 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

This material is sold for research and development purposes only. It is not for any human or animal therapeutic or clinical diagnostic use. It is not intended for food, drug, household, agricultural, or cosmetic use. An individual technically qualified to handle potentially hazardous chemicals must supervise the use of this material.

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 be 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 PARTCULAR PURPOSE.

**End of Safety Data Sheet**