

**THE UNIVERSITY OF WESTERN ONTARIO  
BIOLOGICAL AGENTS REGISTRY FORM**  
Approved Biohazards Subcommittee: October 14, 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>Harvey Goldberg</u>
DEPARTMENT	<u>Dentistry</u>
ADDRESS	<u>DSB 0019</u>
PHONE NUMBER	<u>#82182</u>
EMERGENCY PHONE NUMBER(S)	<u>519 661-2182</u>
EMAIL	<u>hagoldbe@uwo.ca</u>

Location of experimental work to be carried out: Building(s) DSB Room(s) 0019,0021, 0032, 0024A

\*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 AO Foundation

GRANT TITLE(S): 1) Functional Characterization of Bone Sialoprotein. 2) Peptidmonetics and Proteomic Modulators of Pro-inflammatory Functions of Osteopontin. 3) Delivery of Bone Sialoprotein Within Scaffolds for Enhanced Bone Repair.

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>Hong Hong Chen</u>	<u><a href="mailto:Hchen38@uwo.ca">Hchen38@uwo.ca</a></u>	<u>Sept.26, 2002</u>
<u>Michelle Siqueira</u>	<u><a href="mailto:michellefsiqueira@gmail.com">michellefsiqueira@gmail.com</a></u>	<u>Oct.19, 2009</u>
<u>Yohannes Soenjava</u>	<u><a href="mailto:ysoenjay@uwo.ca">ysoenjay@uwo.ca</a></u>	<u>Sept.14,2009</u>
<u>Erik Holm</u>	<u><a href="mailto:eholm@uwo.ca">eholm@uwo.ca</a></u>	<u>Sept. 2008</u>

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**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.**

Biological materials waste generated during culture are bleached immediately after use.

All the containers used for the materials mentioned above (including culture flasks, plates, tips, pipettes) are autoclaved before disposal. Thus after use, they are stored in appropriate bags, bags sealed and material autoclaved (autoclave generally once a week).

After animal related experiments, animal bodies are temporarily stored at -20 C, and transferred to the cold room in animal facility (MSB 6<sup>th</sup> floor) on a routine basis for incineration.

Stock adenoviruses are stored at -80<sup>0</sup>C. Stock mammalian cells are stored in liquid nitrogen or -80<sup>0</sup>C freezer and bacteria stocks are stored at -80<sup>0</sup>C.

**Please include a one page research summary or teaching protocol.**

### **FUNCTIONAL CHARACTERIZATION OF MINERAL ASSOCIATED PROTEINS**

**Background:** Studies by us and others have shown that bone sialoprotein (BSP) and osteopontin (OPN) plays central roles in the development and turnover of bone. Furthermore, expression of OPN in soft tissues and biological fluids is believed related to its role as an inhibitor of mineralization, in addition to its demonstrated roles in inflammatory processes and wound repair. To date, our ongoing structure-function analyses of BSP have identified the collagen-binding site and two hydroxyapatite (HA)-nucleating poly-glutamic acid [poly(E)] sequences as well as providing some insight into the mechanisms of these activities. We have also shown that integrin engagement by the arginine-glycine-aspartic acid (RGD) sequence of BSP, and in part OPN, promotes differentiation of osteoblasts, NFATc1 translocation and bone resorption by osteoclasts, and upregulation of specific signaling pathways in chondrocytes. However, understanding of the mechanisms by which BSP interacts with HA and collagen remains elusive. In addition to studies of OPN in mineralized tissues, we are indirectly involved in studies on inflammatory processes and wound repair mediated by this protein. We have developed the reagents, techniques and concepts necessary to identify the key details of the structure-function relationships of BSP and OPN. The studies are focused on determining the mechanism of biomineralization mediated by BSP and its interaction with collagen, in addition to understanding the multiple roles of OPN.

A number of related studies utilize various in vitro and in vivo techniques. Primarily we develop and test protein reagents isolated from rat and bovine bone, or prokaryotically-expressed wild type and mutated BSP and OPN both as full-length proteins and peptides. We have transgenic mice that are used for isolation of cells and for certain in vivo studies, procedures which are also performed on wild type mice and rats. We have a variety of adenoviral expression constructs for OPN and BSP that we use to transduce cells to express the proteins of interest. Furthermore we have several different eukaryotic and prokaryotic cell lines which are used to create the reagents or to perform functional analysis including intracellular signaling and differentiation. In addition, my lab is involved in other studies that utilize only biophysical techniques to study protein-mineral interactions, though some of the experiments are performed elsewhere or in collaboration with others.

Current Projects:

**To identify the BSP-binding domain in type I collagen and determine the physiological relevance of this interaction.**

**To define the motifs which contribute to the HA-nucleating activity of BSP.**

**To determine the mechanism by which BSP nucleates HA.**

**To delineate the signaling pathways mediated by BSP and OPN interaction in bone cells.**

**To develop therapeutic reagents to promote bone repair utilizing active domains of our proteins in combination of growth factors and/or osteoprogenitor cells or possibly mesenchymal stem cells in scaffolds composed of poly(ester)-urethane or collagen.**

**Significance:** Our studies of BSP and OPN will lead to new insights into the mechanisms underlying biomineralization in bone. Precise identification of the domains and mechanisms of action of BSP and OPN will allow us to design novel therapeutics for bone repair and replacement and to improve the osseous integration of orthopaedic implants, in addition to addressing pathological calcifications including kidney stone and atherosclerosis.

## **1.0 Microorganisms**

1.1 Does your work involve the use of biological agents? **X 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)* (Be specific)	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 XL-1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.3 litres	Stratagene	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3
E.coli XL-10	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	0.3 Litres	Stratagene	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3
E.coli BL-21	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Less than 10 Litres	Novagene	<input checked="" type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 2+ <input type="checkbox"/> 3
Adenovirus	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	< 50µl	Invitrogen	<input type="checkbox"/> 1 <input checked="" 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	calvaria, long bone	2008-092
Non-human primate	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
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)*	Containment Level of each cell line	Supplier / Source of cell line(s)
Human	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	HEK293	2	ATCC
Rodent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	MC3T3 ROS17.28 C3H/10T1/2 ATDC5	2	ATCC for all; ATDC5 obtained from Dr. Beier
Non-human primate	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Other (specify)	<input type="checkbox"/> 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)

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/UNKNOWN	Name of Infectious Agent (If applicable)	PHAC or CFIA Containment Level (Select one)
Human Blood (whole) or other Body Fluid		<input type="checkbox"/> Yes <input type="checkbox"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="checkbox"/> 2+ <input type="radio"/> 3
Human Blood (fraction) or other Body Fluid		<input type="checkbox"/> Yes <input type="checkbox"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="checkbox"/> 2+ <input type="radio"/> 3
Human Organs or Tissues (unpreserved)		<input type="checkbox"/> Yes <input type="checkbox"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="checkbox"/> 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

CELLS Used for Cloning *	Plasmid(s) **	Source of Plasmid	Gene Transfected	Describe the change that results from transformation or transfection
E.coli XL10	pET28a(+)	Stratagene	Bone sialoprotein and osteopontin genes transformed	Amplified the wild type and mutated plasmids. Plasmids used for bacterial (BL21)

				expression of proteins

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

\*\* Please attach a plasmid map.

4.3 Will genetic modification(s) of bacteria and/or cells 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	pAd/cmv/V5-DEST	Invitrogen	Bone sialoprotein, osteopontin	When transfect into primary cells cause alteration in osteoblast differentiation

\* 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 HEK cells have adenoviral replication genes incorporated into their genome

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 rat and mouse

6.3 AUS protocol # 2009-008

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

6.5 Will the agent(s) be shed by the animal:  YES  X **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 Will live animals be used?  YES  No

7.3 If yes, 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

7.4 If no live animals are used, please specify the source of the specimens:  
\_\_\_\_\_

## 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) \_\_\_\_\_  
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 \_\_\_\_\_

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?  YES, Please provide details: \_\_\_\_\_  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:

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### 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: \_\_\_\_\_

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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.

*M. Goldbey*

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, date of most recent biosafety inspection: \_\_\_ Oct 19, 2010  
 NO, please certify  
 NOT REQUIRED for Level 1 containment

13.3 Please indicate permit number (not applicable for first time applicants): \_\_\_\_\_

**14.0 Procedures to be Followed**

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

\_\_\_\_\_NA\_\_\_\_\_

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

\_\_\_\_\_Thorough washing of related body parts that become exposed (sink, for hands, arms; eye wash station for face/eyes;\_\_\_\_\_

14.3 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/>

*M. Goldbey*

SIGNATURE

Date: January 31, 2011

**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: \_\_\_\_\_

Date: \_\_\_\_\_

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

\_\_\_\_\_

Special Conditions of Approval:



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

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

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

Ms. Shamila Survery / Mr. Michael Decosimo  
Cedarlane 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       | • DH5-alpha        | • 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            | • W311C        |
| • 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.

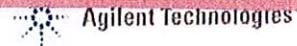
Sincerely,

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

Canada



# Material Safety Data Sheet



**Stratagene XL1-Blue Competent Cells, Catalog #200249**

## 1. Product and company identification

**Product name** : Stratagene XL1-Blue Competent Cells, Catalog #200249  
**Part No.** : pUC18 Control Plasmid 200231-42  
 DNA  
 1.42 M 2-Mercaptoethanol 210200-43  
 XL1-Blue Competent Cells 200236-41  
**Manufacturer / Supplier** : Agilent Technologies, Inc.  
 1834 State Highway 71 West  
 Cedar Creek, TX 78612  
**Emergency telephone number** : 1-800-894-1304  
**Use of the substance/preparation** : Chemical Kit  
**Validation date** : 01/09/2009

## 2. Hazards identification

**Physical state** : pUC18 Control Plasmid Liquid.  
 DNA  
 1.42 M 2-Mercaptoethanol Liquid.  
 XL1-Blue Competent Cells Liquid.  
**Odor** : pUC18 Control Plasmid Not available.  
 DNA  
 1.42 M 2-Mercaptoethanol Not available.  
 XL1-Blue Competent Cells Not available.  
**OSHA/HCS status** : pUC18 Control Plasmid While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.  
 DNA  
 1.42 M 2-Mercaptoethanol This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
 XL1-Blue Competent Cells This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Emergency overview-Signal Word** : WARNING !  
**Emergency overview-Label Statement** : pUC18 Control Plasmid NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.  
 DNA  
 1.42 M 2-Mercaptoethanol HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.  
 XL1-Blue Competent Cells HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

## 2. Hazards identification

	pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol	No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing. Toxic if swallowed. Irritating to eyes and skin. May cause sensitization by skin contact. Do not breathe vapor or mist. Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Wash thoroughly after handling.
	XL1-Blue Competent Cells	Toxic if swallowed. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Wash thoroughly after handling.
	pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol	Not available. Not available.
	XL1-Blue Competent Cells	Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
<b>Routes of entry</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol XL1-Blue Competent Cells	Eye contact. Ingestion. Dermal contact. Eye contact. Inhalation. Ingestion. Eye contact. Inhalation. Ingestion.
<b><u>Potential acute health effects</u></b>		
<b>Eyes</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol XL1-Blue Competent Cells	No known significant effects or critical hazards. Irritating to eyes. No known significant effects or critical hazards.
<b>Skin</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol XL1-Blue Competent Cells	No known significant effects or critical hazards. Irritating to skin. May cause sensitization by skin contact. No known significant effects or critical hazards.
<b>Inhalation</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol XL1-Blue Competent Cells	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Ingestion</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol XL1-Blue Competent Cells	No known significant effects or critical hazards. Toxic if swallowed. Toxic if swallowed.
<b>Medical conditions aggravated by over-exposure</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol  XL1-Blue Competent Cells	Not applicable. Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to the substance can produce target organs damage.
<b>Over-exposure signs/symptoms</b>	: pUC18 Control Plasmid DNA 1.42 M 2-Mercaptoethanol XL1-Blue Competent Cells	Not applicable. Not applicable. Not applicable.

See toxicological information (section 11)

### 3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
1.42 M 2-Mercaptoethanol 2-Mercaptoethanol	60-24-2	10
XL1-Blue Competent Cells		
Glycerol	56-81-5	5 - 10
Manganese dichloride	7773-01-5	5 - 10
Sucrose	57-50-1	5 - 10
Dimethyl sulfoxide	67-68-5	5 - 10
Potassium chloride	7447-40-7	1 - 5

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

### 4. First aid measures

<b>Eye contact</b>	: pUC18 Control Plasmid DNA	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
	: 1.42 M 2-Mercaptoethanol	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
	: XL1-Blue Competent Cells	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
<b>Skin contact</b>	: pUC18 Control Plasmid DNA	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
	: 1.42 M 2-Mercaptoethanol	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
	: XL1-Blue Competent Cells	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
<b>Inhalation</b>	: pUC18 Control Plasmid DNA	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
	: 1.42 M 2-Mercaptoethanol	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
	: XL1-Blue Competent Cells	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.

## 4. First aid measures

<b>Ingestion</b>	: pUC18 Control Plasmid DNA	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
	: 1.42 M 2-Mercaptoethanol	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
	: XL1-Blue Competent Cells	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
<b>Protection of first-aiders</b>	: pUC18 Control Plasmid DNA	Not applicable.
	: 1.42 M 2-Mercaptoethanol	Not applicable.
	: XL1-Blue Competent Cells	Not applicable.
<b>Notes to physician</b>	: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.	

## 5. Fire-fighting measures

<b>Flammability of the product</b>	: pUC18 Control Plasmid DNA	Non-flammable.
	: 1.42 M 2-Mercaptoethanol	Non-flammable.
	: XL1-Blue Competent Cells	Non-flammable.
<b>Products of combustion</b>	: pUC18 Control Plasmid DNA	No specific data.
	: 1.42 M 2-Mercaptoethanol	Decomposition products may include the following materials: carbon oxides sulfur oxides
	: XL1-Blue Competent Cells	Decomposition products may include the following materials: carbon oxides sulfur oxides halogenated compounds metal oxide/oxides

### Extinguishing media

<b>Suitable</b>	: pUC18 Control Plasmid DNA	Use an extinguishing agent suitable for the surrounding fire.
	: 1.42 M 2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire.
	: XL1-Blue Competent Cells	Use an extinguishing agent suitable for the surrounding fire.
<b>Not suitable</b>	: pUC18 Control Plasmid DNA	Not applicable.
	: 1.42 M 2-Mercaptoethanol	Not applicable.
	: XL1-Blue Competent Cells	Not applicable.
<b>Special protective equipment for fire-fighters</b>	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.	
<b>Special remarks on fire hazards</b>	: pUC18 Control Plasmid DNA	Not available.
	: 1.42 M 2-Mercaptoethanol	Not available.
	: XL1-Blue Competent Cells	Not available.
	: Not available.	
<b>Special remarks on explosion hazards</b>	: Not available.	

## 6. Accidental release measures

<b>Personal precautions</b>	: pUC18 Control Plasmid DNA	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
	1.42 M 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
	XL1-Blue Competent Cells	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
<b>Environmental precautions</b>	: pUC18 Control Plasmid DNA	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	1.42 M 2-Mercaptoethanol	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	XL1-Blue Competent Cells	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
<b>Methods for cleaning up</b> <b>Small spill</b>	: pUC18 Control Plasmid DNA	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	1.42 M 2-Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	XL1-Blue Competent Cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## 7. Handling and storage

<b>Handling</b>	: pUC18 Control Plasmid DNA	Wash thoroughly after handling.
	1.42 M 2-Mercaptoethanol	Do not ingest. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
	XL1-Blue Competent Cells	Do not ingest. Wash thoroughly after handling.

## 7. Handling and storage

**Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

### Product name

### Exposure limits

### United States

1.42 M 2-Mercaptoethanol  
2-Mercaptoethanol

AIHA WEEL (United States, 1/2008).  
TWA: 0.2 ppm 8 hour(s).

XL1-Blue Competent Cells  
Glycerol

ACGIH TLV (United States, 1/2008).  
TWA: 10 mg/m<sup>3</sup> 8 hour(s). Form: Mist  
OSHA PEL (United States, 11/2006).  
TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction  
TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust  
OSHA PEL 1989 (United States, 3/1989).  
TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction  
TWA: 10 mg/m<sup>3</sup> 8 hour(s). Form: Total dust

Manganese dichloride

ACGIH TLV (United States, 1/2008).  
TWA: 0.2 mg/m<sup>3</sup>, (as Mn) 8 hour(s).  
OSHA PEL 1989 (United States, 3/1989).  
CEIL: 5 mg/m<sup>3</sup>, (as Mn)  
NIOSH REL (United States, 12/2001).  
TWA: 1 mg/m<sup>3</sup>, (as Mn) 10 hour(s).  
STEL: 3 mg/m<sup>3</sup>, (as Mn) 15 minute(s).  
OSHA PEL (United States, 11/2006).  
CEIL: 5 mg/m<sup>3</sup>, (as Mn)

Sucrose

ACGIH TLV (United States, 1/2008).  
TWA: 10 mg/m<sup>3</sup> 8 hour(s).  
OSHA PEL 1989 (United States, 3/1989).  
TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust  
TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction  
NIOSH REL (United States, 12/2001).  
TWA: 10 mg/m<sup>3</sup> 10 hour(s). Form: Total  
TWA: 5 mg/m<sup>3</sup> 10 hour(s). Form: Respirable fraction  
OSHA PEL (United States, 11/2006).  
TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust  
TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction

Dimethyl sulfoxide

AIHA WEEL (United States, 1/2008).  
TWA: 250 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

**Engineering measures** : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

### Personal protection

#### **Eyes**

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

## 8 . Exposure controls/personal protection

Skin	:	Chemical resistant protective gloves and clothing are recommended. The choice of protective gloves or clothing must be based on chemical resistance and other use requirements. Generally, BUNA-N offers acceptable chemical resistance. Individuals who are acutely and specifically sensitive to this chemical may require additional protective clothing.
Respiratory	:	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Other protection	:	Not available.
Hygiene measures	:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

## 9 . Physical and chemical properties

Physical state	:	pUC18 Control Plasmid    Liquid. DNA 1.42 M 2-Mercaptoethanol    Liquid. XL1-Blue Competent    Liquid. Cells
Flash point	:	pUC18 Control Plasmid    Not applicable. DNA 1.42 M 2-Mercaptoethanol    Not applicable. XL1-Blue Competent    Not applicable. Cells
Color	:	pUC18 Control Plasmid    Not available. DNA 1.42 M 2-Mercaptoethanol    Not available. XL1-Blue Competent    Not available. Cells
Odor	:	pUC18 Control Plasmid    Not available. DNA 1.42 M 2-Mercaptoethanol    Not available. XL1-Blue Competent    Not available. Cells
pH	:	pUC18 Control Plasmid    Neutral. DNA 1.42 M 2-Mercaptoethanol    Neutral. XL1-Blue Competent    Neutral. Cells
Boiling/condensation point	:	pUC18 Control Plasmid    Lowest known value: 100°C (212°F) (Water). DNA 1.42 M 2-Mercaptoethanol    Lowest known value: 100°C (212°F) (Water). Weighted average: 105.7°C (222.3°F) XL1-Blue Competent    Lowest known value: 100°C (212°F) (Water). Weighted average: 122.01°C (251.6°F) Cells
Melting/freezing point	:	pUC18 Control Plasmid    May start to solidify at the following temperature: 0°C (32°F) DNA    This is based on data for the following ingredient: Water. 1.42 M 2-Mercaptoethanol    May start to solidify at the following temperature: 0°C (32°F) This is based on data for the following ingredient: Water. XL1-Blue Competent    May start to solidify at the following temperature: 19.8°C (67.6°F) This is based on data for the following ingredient: Cells    Glycerol. Weighted average: 3.02°C (37.4°F)

## 9 . Physical and chemical properties

<b>Relative density</b>	: pUC18 Control Plasmid	Not available.
	DNA	
	1.42 M 2-Mercaptoethanol	Only known value: 1.1 (Water = 1) (2-Mercaptoethanol).
	XL1-Blue Competent Cells	Weighted average: 1.29 (Water = 1)
<b>Vapor pressure</b>	: pUC18 Control Plasmid	Highest known value: 2.3 kPa (17.5 mm Hg) (at 20°C)
	DNA	(Water).
	1.42 M 2-Mercaptoethanol	Highest known value: 2.3 kPa (17.5 mm Hg) (at 20°C) (Water). Weighted average: 2.08 kPa (15.6 mm Hg) (at 20°C)
	XL1-Blue Competent Cells	Highest known value: 2.3 kPa (17.5 mm Hg) (at 20°C) (Water). Weighted average: 2.11 kPa (15.83 mm Hg) (at 20°C)
<b>Vapor density</b>	: pUC18 Control Plasmid	Highest known value: 0.62 (Air = 1) (Water).
	DNA	
	1.42 M 2-Mercaptoethanol	Highest known value: 2.7 (Air = 1) (2-Mercaptoethanol). Weighted average: 0.83 (Air = 1)
	XL1-Blue Competent Cells	Highest known value: 3.1 (Air = 1) (Glycerol). Weighted average: 0.98 (Air = 1)
<b>Evaporation rate</b>	: pUC18 Control Plasmid	Not available.
	DNA	
	1.42 M 2-Mercaptoethanol	Not available.
	XL1-Blue Competent Cells	0.026 (Dimethyl sulfoxide) compared with Butyl acetate.

## 10 . Stability and reactivity

<b>Stability and reactivity</b>	: The product is stable.	
<b>Incompatibility with various substances</b>	: Highly reactive or incompatible with the following materials: oxidizing materials and organic materials. Reactive or incompatible with the following materials: acids.	
<b>Hazardous decomposition products</b>	: pUC18 Control Plasmid	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	DNA	
	1.42 M 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	XL1-Blue Competent Cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Conditions of reactivity - Flammability</b>	: Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.	

## 11 . Toxicological information

### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Dimethyl sulfoxide	LD50 Dermal	Rat	40 gm/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
	LD50 Oral	Rat	29700 mg/kg	-
Sucrose	LD50 Oral	Rat	250 mg/kg	-
Manganese dichloride	LD50 Dermal	Rabbit	>10 gm/kg	-
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
	LD50 Oral	Rat	2600 mg/kg	-

<b>Eyes</b>	: pUC18 Control Plasmid	No known significant effects or critical hazards.
	DNA	
	1.42 M 2-Mercaptoethanol	Irritating to eyes.
	XL1-Blue Competent Cells	No known significant effects or critical hazards.

## 11.11 Toxicological information

<b>Skin</b>	<b>pUC18 Control Plasmid</b>	No known significant effects or critical hazards.
	<b>DNA</b>	
	<b>1.42 M 2-Mercaptoethanol</b>	Irritating to skin. May cause sensitization by skin contact.
	<b>XL1-Blue Competent Cells</b>	No known significant effects or critical hazards.
<b>Inhalation</b>	<b>pUC18 Control Plasmid</b>	No known significant effects or critical hazards.
	<b>DNA</b>	
	<b>1.42 M 2-Mercaptoethanol</b>	No known significant effects or critical hazards.
	<b>XL1-Blue Competent Cells</b>	No known significant effects or critical hazards.
<b>Ingestion</b>	<b>pUC18 Control Plasmid</b>	No known significant effects or critical hazards.
	<b>DNA</b>	
	<b>1.42 M 2-Mercaptoethanol</b>	Toxic if swallowed.
	<b>XL1-Blue Competent Cells</b>	Toxic if swallowed.

### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
XL1-Blue Competent Cells						
Sucrose	A4					

### Potential chronic health effects

<b>Chronic effects</b>	Contains material that may cause target organ damage, based on animal data.
<b>Carcinogenicity</b>	No known significant effects or critical hazards.
<b>Mutagenicity</b>	No known significant effects or critical hazards.
<b>Teratogenicity</b>	No known significant effects or critical hazards.
<b>Developmental effects</b>	No known significant effects or critical hazards.
<b>Fertility effects</b>	No known significant effects or critical hazards.

### Over-exposure signs/symptoms

<b>Inhalation</b>	No specific data.
<b>Ingestion</b>	No specific data.
<b>Skin</b>	No specific data.
<b>Eyes</b>	No specific data.

<b>Target organs</b>	<b>pUC18 Control Plasmid</b>	Not available.
	<b>DNA</b>	
	<b>1.42 M 2-Mercaptoethanol</b>	Not available.
	<b>XL1-Blue Competent Cells</b>	Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
<b>Other adverse effects</b>	<b>pUC18 Control Plasmid</b>	Not available.
	<b>DNA</b>	
	<b>1.42 M 2-Mercaptoethanol</b>	Not available.
	<b>XL1-Blue Competent Cells</b>	Not available.

## 12. Ecological information

<b>Environmental effects</b>	No known significant effects or critical hazards.
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## 12 Ecological information

### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
Dimethyl sulfoxide	-	Acute LC50 35 to 37 ml/L Fresh water	Fish	96 hours
Manganese dichloride	-	Acute LC50 34000000 ug/L Fresh water	Fish	96 hours
Glycerol	-	Acute EC50 4700 ug/L Fresh water	Daphnia	48 hours
Potassium chloride	-	Acute LC50 54 to 57 ml/L Fresh water	Fish	96 hours
	-	Acute EC50 83000 ug/L Fresh water	Daphnia	48 hours
	-	Acute LC50 337 mg/L Fresh water	Daphnia	48 hours
	-	Acute LC50 435000 ug/L Fresh water	Fish	96 hours

Other adverse effects : No known significant effects or critical hazards.

## 13 Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 Transport information

### Regulatory information

DOT / IMDG / IATA : Not regulated.

## 15 Regulatory information

HCS Classification	: pUC18 Control Plasmid - DNA	: Not regulated.
	: 1.42 M 2-Mercaptoethanol	: Toxic material Irritating material Sensitizing material
	: XL1-Blue Competent Cells	: Toxic material Target organ effects

## 15 Regulatory information

pUC18 Control Plasmid DNA Not available.  
 1.42 M-2-Mercaptoethanol Not available.  
 XL1-Blue Competent Cells Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

**U.S. Federal regulations:**

pUC18 Control Plasmid DNA **United States inventory (TSCA 8b):** All components are listed or exempted.  
 1.42 M-2-Mercaptoethanol **United States inventory (TSCA 8b):** All components are listed or exempted.  
 XL1-Blue Competent Cells **United States inventory (TSCA 8b):** All components are listed or exempted.  
 pUC18 Control Plasmid DNA **SARA 302/304/311/312 extremely hazardous substances:** No products were found.  
**SARA 302/304 emergency planning and notification:** No products were found.  
**SARA 302/304/311/312 hazardous chemicals:** No products were found.  
**SARA 311/312 MSDS (distribution, chemical inventory, hazard identification):** No products were found.  
 1.42 M-2-Mercaptoethanol **SARA 302/304/311/312 extremely hazardous substances:** No products were found.  
**SARA 302/304 emergency planning and notification:** No products were found.  
**SARA 302/304/311/312 hazardous chemicals:** 2-Mercaptoethanol.  
**SARA 311/312 MSDS (distribution, chemical inventory, hazard identification):** 2-Mercaptoethanol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard.  
 XL1-Blue Competent Cells **SARA 302/304/311/312 extremely hazardous substances:** No products were found.  
**SARA 302/304 emergency planning and notification:** No products were found.  
**SARA 302/304/311/312 hazardous chemicals:** Potassium chloride, Glycerol, Manganese dichloride, Sucrose, Dimethyl sulfoxide.  
**SARA 311/312 MSDS (distribution, chemical inventory, hazard identification):** Potassium chloride: Immediate (acute) health hazard, Delayed (chronic) health hazard; Glycerol: Immediate (acute) health hazard, Delayed (chronic) health hazard; Manganese dichloride: Delayed (chronic) health hazard; Sucrose: Delayed (chronic) health hazard; Dimethyl sulfoxide: Immediate (acute) health hazard, Delayed (chronic) health hazard.  
 pUC18 Control Plasmid DNA **Clean Water Act (CWA) 307:** No products were found.  
 1.42 M-2-Mercaptoethanol **Clean Water Act (CWA) 307:** No products were found.  
 XL1-Blue Competent Cells **Clean Water Act (CWA) 307:** No products were found.  
 pUC18 Control Plasmid DNA **Clean Water Act (CWA) 311:** Edetic acid.  
 1.42 M-2-Mercaptoethanol **Clean Water Act (CWA) 311:** No products were found.  
 XL1-Blue Competent Cells **Clean Water Act (CWA) 311:** No products were found.

## 15.1 Regulatory information

pUC18 Control Plasmid DNA : Clean Air Act (CAA) 112 accidental release prevention: No products were found.  
 1.42 M-2-Mercaptoethanol : Clean Air Act (CAA) 112 accidental release prevention: No products were found.  
 XL1-Blue Competent Cells : Clean Air Act (CAA) 112 accidental release prevention: No products were found.

pUC18 Control Plasmid DNA : Clean Air Act (CAA) 112 regulated flammable substances: No products were found.  
 1.42 M-2-Mercaptoethanol : Clean Air Act (CAA) 112 regulated flammable substances: No products were found.  
 XL1-Blue Competent Cells : Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

pUC18 Control Plasmid DNA : Clean Air Act (CAA) 112 regulated toxic substances: No products were found.  
 1.42 M-2-Mercaptoethanol : Clean Air Act (CAA) 112 regulated toxic substances: No products were found.  
 XL1-Blue Competent Cells : Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

### SARA 313

Form Reporting requirements	Product Name	CAS #	Concentration
Supplier notification	XL1-Blue Competent Cells	7773-01-5	5 - 10 - 10
	Manganese dichloride	7773-01-5	5 - 10 - 10
	Hexaamminecobalt trichloride	10534-89-4	0.1 - 1 - 1

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State Regulations	Product Name	Regulation
State Regulations	pUC18 Control Plasmid DNA	Connecticut Carcinogen Reporting: None of the components are listed.
		Connecticut Hazardous Material Survey: None of the components are listed.
		Florida substances: None of the components are listed.
		Illinois Chemical Safety Act: None of the components are listed.
		Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
		Louisiana Reporting: None of the components are listed.
		Louisiana Spill: None of the components are listed.
		Massachusetts Spill: None of the components are listed.
		Massachusetts Substances: None of the components are listed.
		Michigan Critical Material: None of the components are listed.
		Minnesota Hazardous Substances: None of the components are listed.
		New Jersey Hazardous Substances: None of the components are listed.
		New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.		
New York Acutely Hazardous Substances: None of the components are listed.		
New York Toxic Chemical Release Reporting: None of the components are listed.		
Pennsylvania RTK Hazardous Substances: None of the components are listed.		

## 15 . Regulatory information

	<p>components are listed. <b>Rhode Island Hazardous Substances:</b> None of the components are listed.</p>
1.42 M 2-Mercaptoethanol	<p><b>Connecticut Carcinogen Reporting:</b> None of the components are listed. <b>Connecticut Hazardous Material Survey:</b> None of the components are listed. <b>Florida substances:</b> None of the components are listed. <b>Illinois Chemical Safety Act:</b> None of the components are listed. <b>Illinois Toxic Substances Disclosure to Employee Act:</b> None of the components are listed. <b>Louisiana Reporting:</b> None of the components are listed. <b>Louisiana Spill:</b> None of the components are listed. <b>Massachusetts Spill:</b> None of the components are listed. <b>Massachusetts Substances:</b> The following components are listed: 2-Mercaptoethanol <b>Michigan Critical Material:</b> None of the components are listed. <b>Minnesota Hazardous Substances:</b> None of the components are listed. <b>New Jersey Hazardous Substances:</b> None of the components are listed. <b>New Jersey Spill:</b> None of the components are listed. <b>New Jersey Toxic Catastrophe Prevention Act:</b> None of the components are listed. <b>New York Acutely Hazardous Substances:</b> None of the components are listed. <b>New York Toxic Chemical Release Reporting:</b> None of the components are listed. <b>Pennsylvania RTK Hazardous Substances:</b> The following components are listed: 2-Mercaptoethanol <b>Rhode Island Hazardous Substances:</b> None of the components are listed.</p>
XL1-Blue Competent Cells	<p><b>Connecticut Carcinogen Reporting:</b> None of the components are listed. <b>Connecticut Hazardous Material Survey:</b> None of the components are listed. <b>Florida substances:</b> None of the components are listed. <b>Illinois Chemical Safety Act:</b> None of the components are listed. <b>Illinois Toxic Substances Disclosure to Employee Act:</b> None of the components are listed. <b>Louisiana Reporting:</b> None of the components are listed. <b>Louisiana Spill:</b> None of the components are listed. <b>Massachusetts Spill:</b> None of the components are listed. <b>Massachusetts Substances:</b> The following components are listed: Glycerol;Sucrose <b>Michigan Critical Material:</b> None of the components are listed. <b>Minnesota Hazardous Substances:</b> None of the components are listed. <b>New Jersey Hazardous Substances:</b> The following components are listed: Manganese dichloride <b>New Jersey Spill:</b> None of the components are listed. <b>New Jersey Toxic Catastrophe Prevention Act:</b> None of the components are listed. <b>New York Acutely Hazardous Substances:</b> None of the components are listed. <b>New York Toxic Chemical Release Reporting:</b> None of the</p>

## 15 . Regulatory information

components are listed.

**Pennsylvania RTK Hazardous Substances:** The following components are listed: Glycerol; Manganese dichloride; Sucrose

**Rhode Island Hazardous Substances:** None of the components are listed.

State regulations - California Prop. 65 : No products were found.

## 16 . Other information

Label requirements	: pUC18 Control Plasmid DNA	NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
	: 1.42 M 2-Mercaptoethanol	HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
	: XL1-Blue Competent Cells	HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Date of issue : 01/09/2009

Version : 1

### Notice to reader

**DISCLAIMER:** This Material Safety Data Sheet is offered without charge to the clients of Agilent Technologies. Data is the most current available to Agilent Technologies at the time of preparation and is issued as a matter of information only, no warranty as to its accuracy or completeness is expressed or implied.

▼ Indicates information that has changed from previously issued version.

# Material Safety Data Sheet



## Stratagene XL10-Gold Ultracompetent Cells, Catalog #200314

### 1. Product and company identification

<b>Product name</b>	: Stratagene XL10-Gold Ultracompetent Cells, Catalog #200314
<b>Part No.</b>	: XL10-Gold Ultracompetent cells 200315-41
	: pUC18 Control Plasmid DNA 200231-42
	: XL10-Gold 2-mercaptoethanol mix 200314-43
<b>Manufacturer / Supplier</b>	: Agilent Technologies, Inc. 1834 State Highway 71 West Cedar Creek, TX 78612
<b>Emergency telephone number</b>	: 1-800-894-1304
<b>Use of the substance/preparation</b>	: Chemical Kit
<b>Validation date</b>	: 11/19/2008

### 2. Hazards identification

<b>Physical state</b>	: XL10-Gold Ultracompetent cells	Liquid.
	: pUC18 Control Plasmid DNA	Liquid.
	: XL10-Gold 2-mercaptoethanol mix	Liquid.
<b>Odor</b>	: XL10-Gold Ultracompetent cells	Not available.
	: pUC18 Control Plasmid DNA	Not available.
	: XL10-Gold 2-mercaptoethanol mix	Characteristic.
<b>OSHA/HCS status</b>	: XL10-Gold Ultracompetent cells	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
	: pUC18 Control Plasmid DNA	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.
	: XL10-Gold 2-mercaptoethanol mix	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Emergency overview-Signal Word</b>	: WARNING !	
<b>Emergency overview-Label Statement</b>	: XL10-Gold Ultracompetent cells	HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
	: pUC18 Control Plasmid DNA	NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
	: XL10-Gold 2-mercaptoethanol mix	COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.
	: XL10-Gold Ultracompetent cells	Toxic if swallowed. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Wash thoroughly after handling.
	: pUC18 Control Plasmid DNA	No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.
	: XL10-Gold 2-mercaptoethanol mix	Combustible liquid. Toxic if swallowed. Irritating to eyes and skin. May cause sensitization by skin contact. Keep away from heat, sparks and flame. Do not breathe vapor or mist.

## 2. Hazards identification

		XL10-Gold Ultracompetent cells	Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Use only with adequate ventilation. Wash thoroughly after handling.
		pUC18 Control Plasmid DNA	Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
		XL10-Gold 2-mercaptoethanol mix	Not available.
<b>Routes of entry</b>	:	XL10-Gold Ultracompetent cells	Inhalation. Ingestion.
		pUC18 Control Plasmid DNA	Eye contact. Ingestion.
		XL10-Gold 2-mercaptoethanol mix	Dermal contact. Inhalation.
<b>Potential acute health effects</b>			
<b>Eyes</b>	:	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		XL10-Gold 2-mercaptoethanol mix	Irritating to eyes.
<b>Skin</b>	:	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		XL10-Gold 2-mercaptoethanol mix	Irritating to skin. May cause sensitization by skin contact.
<b>Inhalation</b>	:	XL10-Gold Ultracompetent cells	No known significant effects or critical hazards.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		XL10-Gold 2-mercaptoethanol mix	No known significant effects or critical hazards.
<b>Ingestion</b>	:	XL10-Gold Ultracompetent cells	Toxic if swallowed.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		XL10-Gold 2-mercaptoethanol mix	Toxic if swallowed.
<b>Medical conditions aggravated by over-exposure</b>	:	XL10-Gold Ultracompetent cells	Repeated or prolonged exposure to the substance can produce target organs damage.
		pUC18 Control Plasmid DNA	Not applicable.
		XL10-Gold 2-mercaptoethanol mix	Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation.
<b>Over-exposure signs/symptoms</b>	:	XL10-Gold Ultracompetent cells	Not applicable.
		pUC18 Control Plasmid DNA	Not applicable.
		XL10-Gold 2-mercaptoethanol mix	Not applicable.

See toxicological information (section 11)

### 3. Composition/information on ingredients

<u>Name</u>	<u>CAS number</u>	<u>%</u>
XL10-Gold Ultracompetent cells		
Glycerol	56-81-5	5 - 10
Manganese dichloride	7773-01-5	5 - 10
Sucrose	57-50-1	5 - 10
Dimethyl sulfoxide	67-68-5	5 - 10
Potassium chloride	7447-40-7	1 - 5
XL10-Gold 2-mercaptoethanol mix		
2-Mercaptoethanol	60-24-2	100

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

### 4. First aid measures

<b>Eye contact</b>	: XL10-Gold Ultracompetent cells	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
	XL10-Gold 2-mercaptoethanol mix	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
<b>Skin contact</b>	: XL10-Gold Ultracompetent cells	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
	XL10-Gold 2-mercaptoethanol mix	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
<b>Inhalation</b>	: XL10-Gold Ultracompetent cells	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
	XL10-Gold 2-mercaptoethanol mix	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
<b>Ingestion</b>	: XL10-Gold Ultracompetent cells	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
	XL10-Gold 2-	Do not induce vomiting unless directed to do so by medical

## 4 . First aid measures

	mercaptoethanol mix	personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
Protection of first-aiders	: XL10-Gold Ultracompetent cells	Not applicable.
	pUC18 Control Plasmid DNA	Not applicable.
	XL10-Gold 2-mercaptoethanol mix	Not applicable.
Notes to physician	: No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.	

## 5 . Fire-fighting measures

Flammability of the product	: XL10-Gold Ultracompetent cells	Non-flammable.
	pUC18 Control Plasmid DNA	Non-flammable.
	XL10-Gold 2-mercaptoethanol mix	Flammable.
Products of combustion	: XL10-Gold Ultracompetent cells	Decomposition products may include the following materials: carbon oxides sulfur oxides halogenated compounds metal oxide/oxides
	pUC18 Control Plasmid DNA	No specific data.
	XL10-Gold 2-mercaptoethanol mix	Decomposition products may include the following materials: carbon oxides sulfur oxides
<b>Extinguishing media</b>		
Suitable	: XL10-Gold Ultracompetent cells	Use an extinguishing agent suitable for the surrounding fire.
	pUC18 Control Plasmid DNA	Use an extinguishing agent suitable for the surrounding fire.
	XL10-Gold 2-mercaptoethanol mix	Use dry chemical, CO <sub>2</sub> , water spray (fog) or foam.
Not suitable	: XL10-Gold Ultracompetent cells	Not applicable.
	pUC18 Control Plasmid DNA	Not applicable.
	XL10-Gold 2-mercaptoethanol mix	Do not use water jet.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.	
Special remarks on fire hazards	: XL10-Gold Ultracompetent cells	Not available.
	pUC18 Control Plasmid DNA	Not available.
	XL10-Gold 2-mercaptoethanol mix	Not available.
Special remarks on explosion hazards	: Not available.	

## 6 . Accidental release measures

Personal precautions	: XL10-Gold Ultracompetent cells	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
	pUC18 Control Plasmid DNA	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep

## 6 . Accidental release measures

		<p>unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8). No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).</p>
	XL10-Gold 2-mercaptoethanol mix	
<b>Environmental precautions</b>	: XL10-Gold Ultracompetent cells	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	pUC18 Control Plasmid DNA	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	XL10-Gold 2-mercaptoethanol mix	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
<b>Methods for cleaning up</b>		
<b>Small spill</b>	: XL10-Gold Ultracompetent cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	pUC18 Control Plasmid DNA	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	XL10-Gold 2-mercaptoethanol mix	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

## 7 . Handling and storage

<b>Handling</b>	: XL10-Gold Ultracompetent cells	Do not ingest. Wash thoroughly after handling.
	pUC18 Control Plasmid DNA	Wash thoroughly after handling.
	XL10-Gold 2-mercaptoethanol mix	Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.
<b>Storage</b>	: Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.	

## 8 . Exposure controls/personal protection

### Product name

### Exposure limits

#### United States

XL10-Gold Ultracompetent cells

Glycerol

ACGIH TLV (United States, 1/2008).

TWA: 10 mg/m<sup>3</sup> 8 hour(s). Form: Mist

OSHA PEL (United States, 11/2006).

TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction

TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust

OSHA PEL 1989 (United States, 3/1989).

TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction

TWA: 10 mg/m<sup>3</sup> 8 hour(s). Form: Total dust

Manganese dichloride

ACGIH TLV (United States, 1/2008).

TWA: 0.2 mg/m<sup>3</sup>, (as Mn) 8 hour(s).

OSHA PEL 1989 (United States, 3/1989).

CEIL: 5 mg/m<sup>3</sup>, (as Mn)

NIOSH REL (United States, 12/2001).

TWA: 1 mg/m<sup>3</sup>, (as Mn) 10 hour(s).

STEL: 3 mg/m<sup>3</sup>, (as Mn) 15 minute(s).

OSHA PEL (United States, 11/2006).

CEIL: 5 mg/m<sup>3</sup>, (as Mn)

Sucrose

ACGIH TLV (United States, 1/2008).

TWA: 10 mg/m<sup>3</sup> 8 hour(s).

OSHA PEL 1989 (United States, 3/1989).

TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust

TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction

NIOSH REL (United States, 12/2001).

TWA: 10 mg/m<sup>3</sup> 10 hour(s). Form: Total

TWA: 5 mg/m<sup>3</sup> 10 hour(s). Form: Respirable fraction

OSHA PEL (United States, 11/2006).

TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust

TWA: 5 mg/m<sup>3</sup> 8 hour(s). Form: Respirable fraction

Dimethyl sulfoxide

AIHA WEEL (United States, 1/2008).

TWA: 250 ppm 8 hour(s).

XL10-Gold 2-mercaptoethanol mix

2-Mercaptoethanol

AIHA WEEL (United States, 1/2008).

TWA: 0.2 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

#### Engineering measures

: If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

#### Personal protection

##### Eyes

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

##### Skin

: Chemical resistant protective gloves and clothing are recommended. The choice of protective gloves or clothing must be based on chemical resistance and other use requirements. Generally, BUNA-N offers acceptable chemical resistance. Individuals who are acutely and specifically sensitive to this chemical may require additional protective clothing.

##### Respiratory

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

##### Hands

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

##### Other protection

: Not available.

##### Hygiene measures

: Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

## 9. Physical and chemical properties

<b>Physical state</b>	: XL10-Gold Ultracompetent cells	Liquid.
	pUC18 Control Plasmid DNA	Liquid.
	XL10-Gold 2-mercaptoethanol mix	Liquid.
<b>Flash point</b>	: XL10-Gold Ultracompetent cells	Not applicable.
	pUC18 Control Plasmid DNA	Not applicable.
	XL10-Gold 2-mercaptoethanol mix	Closed cup: 74°C (165.2°F).
<b>Flammable limits</b>	: XL10-Gold Ultracompetent cells	Not applicable.
	pUC18 Control Plasmid DNA	Not applicable.
	XL10-Gold 2-mercaptoethanol mix	Lower: 2.3% Upper: 18%
<b>Color</b>	: XL10-Gold Ultracompetent cells	Not available.
	pUC18 Control Plasmid DNA	Not available.
	XL10-Gold 2-mercaptoethanol mix	Colorless.
<b>Odor</b>	: XL10-Gold Ultracompetent cells	Not available.
	pUC18 Control Plasmid DNA	Not available.
	XL10-Gold 2-mercaptoethanol mix	Characteristic.
<b>pH</b>	: XL10-Gold Ultracompetent cells	Not available.
	pUC18 Control Plasmid DNA	Neutral.
	XL10-Gold 2-mercaptoethanol mix	Not available.
<b>Boiling/condensation point</b>	: XL10-Gold Ultracompetent cells	Lowest known value: 100°C (212°F) (Water). Weighted average: 122.01°C (251.6°F)
	pUC18 Control Plasmid DNA	Lowest known value: 100°C (212°F) (Water).
	XL10-Gold 2-mercaptoethanol mix	157°C (314.6°F)
<b>Melting/freezing point</b>	: XL10-Gold Ultracompetent cells	May start to solidify at the following temperature: 19.8°C (67.6°F) This is based on data for the following ingredient: Glycerol. Weighted average: 3.02°C (37.4°F)
	pUC18 Control Plasmid DNA	May start to solidify at the following temperature: 0°C (32°F) This is based on data for the following ingredient: Water.
	XL10-Gold 2-mercaptoethanol mix	Not available.
<b>Relative density</b>	: XL10-Gold Ultracompetent cells	Weighted average: 1.29 (Water = 1)
	pUC18 Control Plasmid DNA	Not available.
	XL10-Gold 2-mercaptoethanol mix	Only known value: 1.1 (Water = 1) (2-Mercaptoethanol).
<b>Specific gravity</b>	: XL10-Gold Ultracompetent cells	Not available.
	pUC18 Control Plasmid DNA	Not available.
	XL10-Gold 2-mercaptoethanol mix	1.114 g/cm <sup>3</sup> [20°C (68°F)]

## 9 . Physical and chemical properties

Vapor pressure	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	Highest known value: 0.06 kPa (0.4 mm Hg) (at 20°C) (Dimethyl sulfoxide). Highest known value: 2.3 kPa (17.5 mm Hg) (at 20°C) (Water). 0.1 kPa (1 mm Hg) (at 20°C)
Vapor density	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	Highest known value: 3.1 (Air = 1) (Glycerol). Weighted average: 2.91 (Air = 1) Highest known value: 0.62 (Air = 1) (Water). 2.7 (Air = 1)
Evaporation rate	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	0.026 (Dimethyl sulfoxide) compared with Butyl acetate. Not available. Not available.

## 10 . Stability and reactivity

Stability and reactivity	: The product is stable.	
Incompatibility with various substances	: Highly reactive or incompatible with the following materials: oxidizing materials and organic materials. Reactive or incompatible with the following materials: acids and alkalis.	
Hazardous decomposition products	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Conditions of reactivity - Flammability	: Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.	

## 11 . Toxicological information

### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-Mercaptoethanol	LD50 Dermal	Rabbit	150 uL/kg	-
	LD50 Oral	Rat	244 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40 gm/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Sucrose	LD50 Oral	Rat	29700 mg/kg	-
Manganese dichloride	LD50 Oral	Rat	250 mg/kg	-
Glycerol	LD50 Dermal	Rabbit	>10 gm/kg	-
Potassium chloride	LD50 Oral	Rat	12600 mg/kg	-
	LD50 Oral	Rat	2600 mg/kg	-

Eyes	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	No known significant effects or critical hazards. No known significant effects or critical hazards. Irritating to eyes.
Skin	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	No known significant effects or critical hazards. No known significant effects or critical hazards. Irritating to skin. May cause sensitization by skin contact.
Inhalation	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

## 11 . Toxicological information

**Ingestion** : XL10-Gold Ultracompetent cells Toxic if swallowed.  
 pUC18 Control Plasmid DNA No known significant effects or critical hazards.  
 XL10-Gold 2-mercaptoethanol mix Toxic if swallowed.

### Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
XL10-Gold Ultracompetent cells						
Sucrose	A4	-	-	-	-	-

### Potential chronic health effects

**Chronic effects** : Contains material that may cause target organ damage, based on animal data.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

### Over-exposure signs/symptoms

**Inhalation** : No specific data.  
**Ingestion** : No specific data.  
**Skin** : Adverse symptoms may include the following:  
 irritation  
 redness  
**Eyes** : Adverse symptoms may include the following:  
 pain or irritation  
 watering  
 redness

**Target organs** : XL10-Gold Ultracompetent cells Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.  
 pUC18 Control Plasmid DNA Not available.  
 XL10-Gold 2-mercaptoethanol mix Not available.  
**Other adverse effects** : XL10-Gold Ultracompetent cells Not available.  
 pUC18 Control Plasmid DNA Not available.  
 XL10-Gold 2-mercaptoethanol mix Not available.

## 12 . Ecological information

**Environmental effects** : No known significant effects or critical hazards.

### Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
Dimethyl sulfoxide	-	Acute LC50 35 to 37 ml/L Fresh water	Fish	96 hours
	-	Acute LC50 34000000 ug/L Fresh water	Fish	96 hours
Manganese dichloride	-	Acute EC50 4700 ug/L Fresh water	Daphnia	48 hours
Glycerol	-	Acute LC50 54 to 57 ml/L Fresh water	Fish	96 hours
Potassium chloride	-	Acute EC50 83000 ug/L Fresh water	Daphnia	48 hours

## 12 . Ecological information

Acute LC50 337 mg/L Fresh water	Daphnia	48 hours
Acute LC50 435000 ug/L Fresh water	Fish	96 hours

Other adverse effects : No known significant effects or critical hazards.

## 13 . Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

Regulatory information

DOT / IMDG / IATA : Not regulated.

## 15 . Regulatory information

<b>HCS Classification</b>	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	Toxic material Target organ effects Not regulated.  Combustible liquid Toxic material Irritating material
<b>U.S. Federal regulations</b>	: XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix XL10-Gold Ultracompetent cells  pUC18 Control Plasmid DNA	<b>United States inventory (TSCA 8b):</b> All components are listed or exempted. <b>United States inventory (TSCA 8b):</b> All components are listed or exempted. <b>United States inventory (TSCA 8b):</b> All components are listed or exempted. <b>SARA 302/304/311/312 extremely hazardous substances:</b> No products were found. <b>SARA 302/304 emergency planning and notification:</b> No products were found. <b>SARA 302/304/311/312 hazardous chemicals:</b> Potassium chloride; Glycerol; Manganese dichloride; Sucrose; Dimethyl sulfoxide <b>SARA 311/312 MSDS distribution - chemical inventory - hazard identification:</b> Potassium chloride: Immediate (acute) health hazard, Delayed (chronic) health hazard; Glycerol: Immediate (acute) health hazard, Delayed (chronic) health hazard; Manganese dichloride: Delayed (chronic) health hazard; Sucrose: Delayed (chronic) health hazard; Dimethyl sulfoxide: Immediate (acute) health hazard, Delayed (chronic) health hazard <b>SARA 302/304/311/312 extremely hazardous substances:</b> No products were found. <b>SARA 302/304 emergency planning and notification:</b> No

## 15 . Regulatory information

XL10-Gold 2-mercaptoethanol mix	<p>products were found.                  SARA 302/304/311/312 hazardous chemicals: No products were found.                  SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.                  SARA 302/304/311/312 extremely hazardous substances: No products were found.                  SARA 302/304 emergency planning and notification: No products were found.                  SARA 302/304/311/312 hazardous chemicals: 2-Mercaptoethanol                  SARA 311/312 MSDS distribution - chemical inventory - hazard identification: 2-Mercaptoethanol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard</p>
XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	<p>Clean Water Act (CWA) 307: No products were found.                  Clean Water Act (CWA) 307: No products were found.                  Clean Water Act (CWA) 307: No products were found.</p>
XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	<p>Clean Water Act (CWA) 311: No products were found.                  Clean Water Act (CWA) 311: Edetic acid                  Clean Water Act (CWA) 311: No products were found.</p>
XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	<p>Clean Air Act (CAA) 112 accidental release prevention: No products were found.                  Clean Air Act (CAA) 112 accidental release prevention: No products were found.                  Clean Air Act (CAA) 112 accidental release prevention: No products were found.</p>
XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	<p>Clean Air Act (CAA) 112 regulated flammable substances: No products were found.                  Clean Air Act (CAA) 112 regulated flammable substances: No products were found.                  Clean Air Act (CAA) 112 regulated flammable substances: No products were found.</p>
XL10-Gold Ultracompetent cells pUC18 Control Plasmid DNA XL10-Gold 2-mercaptoethanol mix	<p>Clean Air Act (CAA) 112 regulated toxic substances: No products were found.                  Clean Air Act (CAA) 112 regulated toxic substances: No products were found.                  Clean Air Act (CAA) 112 regulated toxic substances: No products were found.</p>

**SARA 313**

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
<b>Form R - Reporting requirements</b>	: XL10-Gold Ultracompetent cells Manganese dichloride Hexaamminecobalt trichloride	7773-01-5 10534-89-1	5 - 10 0.1 - 1
<b>Supplier notification</b>	: XL10-Gold Ultracompetent cells Manganese dichloride Hexaamminecobalt trichloride	7773-01-5 10534-89-1	5 - 10 0.1 - 1

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

<b>State regulations</b>	: XL10-Gold Ultracompetent cells	<p>Connecticut Carcinogen Reporting: None of the components are listed.                  Connecticut Hazardous Material Survey: None of the components are listed.                  Florida substances: None of the components are listed.                  Illinois Chemical Safety Act: None of the components are listed.                  Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.</p>
--------------------------	----------------------------------	--

## 15 . Regulatory information

pUC18 Control Plasmid  
DNA

**Louisiana Reporting:** None of the components are listed.  
**Louisiana Spill:** None of the components are listed.  
**Massachusetts Spill:** None of the components are listed.  
**Massachusetts Substances:** The following components are listed: Glycerol; Sucrose  
**Michigan Critical Material:** None of the components are listed.  
**Minnesota Hazardous Substances:** None of the components are listed.  
**New Jersey Hazardous Substances:** The following components are listed: Manganese dichloride  
**New Jersey Spill:** None of the components are listed.  
**New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.  
**New York Acutely Hazardous Substances:** None of the components are listed.  
**New York Toxic Chemical Release Reporting:** None of the components are listed.  
**Pennsylvania RTK Hazardous Substances:** The following components are listed: Glycerol; Manganese dichloride; Sucrose  
**Rhode Island Hazardous Substances:** None of the components are listed.

**Connecticut Carcinogen Reporting:** None of the components are listed.  
**Connecticut Hazardous Material Survey:** None of the components are listed.  
**Florida substances:** None of the components are listed.  
**Illinois Chemical Safety Act:** None of the components are listed.  
**Illinois Toxic Substances Disclosure to Employee Act:** None of the components are listed.  
**Louisiana Reporting:** None of the components are listed.  
**Louisiana Spill:** None of the components are listed.  
**Massachusetts Spill:** None of the components are listed.  
**Massachusetts Substances:** None of the components are listed.  
**Michigan Critical Material:** None of the components are listed.  
**Minnesota Hazardous Substances:** None of the components are listed.  
**New Jersey Hazardous Substances:** None of the components are listed.  
**New Jersey Spill:** None of the components are listed.  
**New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.  
**New York Acutely Hazardous Substances:** None of the components are listed.  
**New York Toxic Chemical Release Reporting:** None of the components are listed.  
**Pennsylvania RTK Hazardous Substances:** None of the components are listed.  
**Rhode Island Hazardous Substances:** None of the components are listed.

XL10-Gold 2-  
mercaptoethanol mix

**Connecticut Carcinogen Reporting:** None of the components are listed.  
**Connecticut Hazardous Material Survey:** None of the components are listed.  
**Florida substances:** None of the components are listed.  
**Illinois Chemical Safety Act:** None of the components are listed.  
**Illinois Toxic Substances Disclosure to Employee Act:** None of the components are listed.  
**Louisiana Reporting:** None of the components are listed.  
**Louisiana Spill:** None of the components are listed.  
**Massachusetts Spill:** None of the components are listed.  
**Massachusetts Substances:** The following components are

## 15 . Regulatory information

listed: 2-Mercaptoethanol  
**Michigan Critical Material:** None of the components are listed.  
**Minnesota Hazardous Substances:** None of the components are listed.  
**New Jersey Hazardous Substances:** None of the components are listed.  
**New Jersey Spill:** None of the components are listed.  
**New Jersey Toxic Catastrophe Prevention Act:** None of the components are listed.  
**New York Acutely Hazardous Substances:** None of the components are listed.  
**New York Toxic Chemical Release Reporting:** None of the components are listed.  
**Pennsylvania RTK Hazardous Substances:** The following components are listed: 2-Mercaptoethanol  
**Rhode Island Hazardous Substances:** None of the components are listed.

State regulations - : No products were found.  
California Prop. 65

## 16 . Other information

Label requirements	: XL10-Gold Ultracompetent cells	HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
	pUC18 Control Plasmid DNA	NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
	XL10-Gold 2-mercaptoethanol mix	COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.

Date of issue : 11/19/2008  
Version : 1

### Notice to reader

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▼ Indicates information that has changed from previously issued version.



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## MATERIAL SAFETY DATA SHEET (MSDS)

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Revision Date: 1/11

NEB #C2527

### SECTION 1--CHEMICAL INFORMATION

Product Name: BL21(DE3) Competent *E. coli*

Cas.# None

### SECTION 2--COMPOSITION/INFORMATION ON INGREDIENT

- |                       |       |               |
|-----------------------|-------|---------------|
| 1. Glycerol           | 1-10% | Cas.# 56-81-5 |
| 2. Dimethyl Sulfoxide | 1-10% | Cas.# 67-68-5 |

The ingredients listed in this section include only those items that have more than 1% of a component classified as hazardous and 0.1% of a component classified as carcinogenic. If you have any questions, please contact info@neb.com.

### SECTION 3--HAZARDOUS IDENTIFICATION

**Emergency Overview:** Warning: May cause irritation to skin, eyes, and respiratory tract, may affect kidneys, blood and liver.

**HMIS and NFPA Ratings:** 0 - Minimal or None, 1 - Slight, 2 - Moderate, 3 - Serious, and 4 - Severe

Health: 1  
Flammability: 1  
Reactivity: 0

### SECTION 4--FIRST AID MEASURES

**Eyes:** Flush eyes with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating eyelids. Call a physician.

**Skin:** Wash skin with soap and copious amount of water.

**Ingestion:** If the person is conscious, wash out mouth with water. Call a physician.

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

### SECTION 5--FIRE FIGHTING MEASURES

**Extinguishing Media:** Water spray. Carbon dioxide, dry chemical powder or appropriate foam.

**Special Fire Fighting Procedures:** Wear self contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

**Fire and Explosion Hazards:** Combustible liquid. Emits toxic fumes under fire conditions.

### SECTION 6--ACCIDENTAL RELEASE MEASURES

**Personal Precautions:** Avoid breathing or contact with vapors, mist or gas.

**Procedure of Personal Precaution:** Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves and chemical safety goggles. Use non-sparking tools and equipment. Ventilate and evacuate area of leak or spill.

**Environmental Precautions:** Do not let product enter drains.

**Methods For Cleaning Up:** Cover with dry lime, sand, or soda ash. Sweep up and shovel. Place in covered container for disposal.

### SECTION 7--HANDLING AND STORAGE

**Handling:** Provide appropriate exhaust ventilation.

**User Exposure:** Avoid inhalation. Avoid contact with DMSO solutions containing toxic materials or material with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body. Avoid prolonged or repeated exposure.

**Storage:** Keep tightly closed in a dry and well ventilated place. Store at -20°C.

## SECTION 8--EXPOSURE CONTROLS/PPE

**Engineering Controls:** Safety shower and eye wash. Mechanical exhaust.

**Personal Protective Equipment**

**Eye Protection:** Safety goggles.

**Hand Protection:** Compatible resistant gloves.

**Respiratory Protection:** Government approved respirator.

**Hygiene Measure:** General practice, wash (hands and skin) thoroughly after handling. Remove and wash contaminated clothing.

## SECTION 9--PHYSICAL AND CHEMICAL PROPERTIES

**Physical State:** Form: Liquid                      Color: Clear or colorless                      Odor: No Data Available

<u>Property</u>	<u>Value</u>	<u>Temperature or Pressure</u>	
Boiling Point Range:		>189°C	
Melting Point Range:		>18.4°C	
Flash Point:		>87°C	Method: Closed cup
Auto Ignition Temp:		>215°C	
Vapor Pressure:	.42 mmHg	20°C	
Vapor Density:	2.7 g/l		
Specific Gravity:	1.1		
Solubility in Water:	Soluble		

## SECTION 10--STABILITY AND REACTIVITY

**Stability:** Stable under recommended storage conditions.

**Conditions to Avoid:** Moisture

**Materials to Avoid:** Acid chlorides, Phosphorus halides, strong oxidizing agents, strong acids, strong reducing agents.

**Hazardous Decomposition Products:** Carbon monoxide, Carbon dioxide, Sulfur dioxides.

**Hazardous Polymerization:** Will not occur.

**Hazardous Exothermic Reactions:** Hazardous Exothermic Reactions: Methyl sulfoxide (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 and perchloric and periodic acids. When heated above its boiling point methyl sulfoxide degrades giving off formaldehyde, methyl mercaptan and sulfur dioxide.

## SECTION 11--TOXICOLOGICAL INFORMATION

**Acute and Chronic Effects Based On Routes Of Exposure**

**Effects on Fertility:** Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

**Effects on Embryo or Fetus:** Fetotoxicity (except death, e.g., stunted fetus).

**Specific Developmental Abnormalities:** Musculoskeletal System

**Eye Contact:** May cause irritation.

**Skin Contact:** May cause irritation.

**Ingestion:** May cause nausea, coughing, headache or diarrhea.

**Inhalation:** Unlikely at room temperature, inhalation of mist may cause irritation of respiratory tract.

**Chronic Exposure**

**Target Organ(s):** May cause kidney and liver damage.

**Aggravation of Pre-existing Conditions:** Persons with pre-existing skin disorder or eye problems or impaired liver or kidneys may be more susceptible to the effects of the material.

**NTP:** No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen.

**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.

**ACGIH:** No component of this product present at levels greater than or equal to 0.1 % is identified as a known or suspected human carcinogen or confirmed animal with unknown relevance humans.

**Route of Exposure**

**Skin Absorption:** May be harmful if absorbed.

**Contact:** May cause skin irritation.

**Eye Contact:** May cause eye irritation.

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

**Ingestion:** May be harmful if swallowed.

**Conditions Aggravated By Exposure:** Avoid contact with DMSO solutions containing toxic materials or material with unknown toxicological properties. Dimethyl sulfoxide is readily absorbed through skin and may carry such materials into the body. Avoid prolonged or repeated exposure.

**Target Organ (s) or System (s):** Eyes and Skin

**Toxicity Data**

**Inhalation**

Rat  
40,250 ppm  
LC50

**Oral**

Rat  
3,300 mg/kg  
LD50

**Oral**

Rat  
14,500 mg/kg  
LD50

Remarks: Sense Organs and Special Senses (Nose, Eye, Ear and Taste): Eye: Hemorrhage. Sense Organs and Special Senses (Nose, Eye, Ear and Taste): Eye: Conjunctive irritation.

**Skin**

Rat  
40,000 mg/kg  
LD50

**Intraperitoneal**

Rat  
8,200 mg/kg  
LD50

**Subcutaneous**

Rat  
12 g/kg  
LD50

Remarks: Behavioral: Change in motor activity (specific assay), Lungs, Thorax, or Respiration: Dyspnea.

**Intravenous**

Rat  
5,360 mg/kg  
LD50

Remarks: Behavioral: Tremor, Muscle weakness. Lungs, Thorax or Respiration: Dyspnea.

**Chronic Exposure - Carcinogen**

Species: Rat  
Route of Application: Oral  
Dose: 59 gm/kg  
Exposure Time: 81W  
Frequency: I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria, Skin and Appendages: Other: Tumors.

Species: Rat  
Route of Application: Subcutaneous  
Dose: 220 gm/kg  
Exposure Time: 82W  
Frequency I  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria, Skin and Appendages: Other: Tumors.

**Chronic Exposure - Mutagen**

Species: Rat  
Route: Intraperitoneal  
Dose: 25 gm/kg  
Exposure Time: 5D  
Mutation Test: Cytogenetic analysis.

**Chronic Exposure - Reproductive Hazard**

Species: Rat  
Dose: 56 gm/kg  
Route of Application: Intraperitoneal  
Exposure Time: (6-12D PREG)  
Result: Effects on Fertility: Abortion

Species: Rat  
Dose: 6,600 mg/kg  
Route of Application: Intraperitoneal  
Exposure Time: (7-15D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species : Rat  
Dose: 30,750 mg/kg  
Route of Application: Subcutaneous  
Exposure Time: (8-10D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

## SECTION 12--ECOLOGICAL INFORMATION

Elimination Information (persistence and degradability): No data available.

### Ecotoxicity Effects

Toxicity to fish	LC50-Pimephales promelas (fathead minnow) - 34,000 mg/l - 96 h
	LC50-Oncorhynchus mykiss (rainbow trout) - 35,000 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50-Daphnia pulex (water flea) - 27,500 mg/l
Toxicity to algae	EC50 - Lepomis macrochirus (Blue Gill) - > 400,000 mg/l - 96 h

Further Information On Ecology: No data available.

## SECTION 13--DISPOSAL CONSIDERATIONS

Dispose of container, unused contents and contaminated packaging in accordance with federal, state and local requirement. Contract with a licensed Chemical Waste Disposal Service.

## SECTION 14--TRANSPORT INFORMATION

This product is not dangerous and no special precautions are needed according to DOT, ADR/RID (cross border), IMDG and IATA/ICAO.

## SECTION 15--REGULATORY INFORMATION

OSHA Hazards: None known.

### US Classification and Label Test

US Statements: Combustible. Readily absorbed through skin. Target Organ (s): Eyes, skin, liver and kidneys. Caution. Avoid contact and inhalation.

### United States Regulatory Information:

Sara Listed: No

TSCA Inventory Item: Yes

### 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: Yes

NDSL: No

### EU Additional Classification

S: 23 24/25

Safety Statements: Do not breath vapor. Avoid contact with skin and eyes.

## SECTION 16--OTHER INFORMATION

### DISCLAIMER

The information provided on the MSDS is furnished in good faith and based on our present knowledge. However, this MSDS shall not constitute a guarantee of any kind. Personnel handling this material must make independent determinations of the suitability and completeness of information from all sources to assure proper use and disposal of this material and the safety and health of employees and customers. NEB assumes no additional liability or responsibility resulting from the use of, or reliance on this information. This product is for R&D use only. Not for drug, household or other uses.

Questions about the information found on this MSDS should be directed to [info@neb.com](mailto:info@neb.com).

Public Health  
Agency of CanadaAgence de la santé  
publique du Canada

Canada

Home > Emergency Preparedness > Laboratory Security > Pathogen Safety Data Sheets (PSDS) >  
Adenovirus types 1, 2, 3, 4, 5 and 7 - Material Safety Data Sheets (MSDS)

## Adenovirus types 1, 2, 3, 4, 5 and 7 - Material Safety Data Sheets (MSDS)

### MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

#### SECTION I - INFECTIOUS AGENT

**NAME:** *Adenovirus types 1, 2, 3, 4, 5 and 7*

**SYNONYM OR CROSS REFERENCE:** ARD, acute respiratory disease, pharyngoconjunctival fever

**CHARACTERISTICS:** *Adenoviridae*; non-enveloped, icosahedral virions, 70-90 nm diameter, doubled-stranded, linear DNA genome.

#### SECTION II - HEALTH HAZARD

**PATHOGENICITY:** Varies in clinical manifestation and severity; symptoms include fever, rhinitis, pharyngitis, tonsillitis, cough and conjunctivitis; common cause of nonstreptococcal exudative pharyngitis among children under 3 years; more severe diseases include laryngitis, croup, bronchiolitis, or severe pneumonia; a syndrome of pharyngitis and conjunctivitis (pharyngoconjunctival fever) is associated with adenovirus infection

**EPIDEMIOLOGY:** Worldwide; seasonal in temperate regions, with highest incidences in the fall, winter and early spring; in tropical areas, infections are common in the wet and colder weather; annual incidence is particularly high in children; adenovirus types 4 and 7 are common among military recruits (ARD)

**HOST RANGE:** Humans

**INFECTIOUS DOSE:** >150 plaque forming units when given intranasally

**MODE OF TRANSMISSION:** Directly by oral contact and droplet spread; indirectly by handkerchiefs, eating utensils and other articles freshly soiled with respiratory discharge of an infected person; outbreaks have been related to swimming pools; possible spread through the fecal-oral route

**INCUBATION PERIOD:** From 1-10 days

**COMMUNICABILITY:** Shortly prior to and for the duration of the active disease

#### SECTION III - DISSEMINATION

**RESERVOIR:** Humans

**ZOONOSIS:** None

**VECTORS:** None

## SECTION IV - VIABILITY

**DRUG SUSCEPTIBILITY:** No specific antiviral available; cidofovir has shown promise in the treatment of adenoviral ocular infections.

**SUSCEPTIBILITY TO DISINFECTANTS:** Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, 0.25% sodium dodecyl sulfate

**PHYSICAL INACTIVATION:** Sensitive to heat >56°C; unusually stable to chemical or physical agents and adverse pH conditions

**SURVIVAL OUTSIDE HOST:** Resistance to chemical and physical agents allows for prolonged survival outside of the body. Adenovirus type 3 survived up to 10 days on paper under ambient conditions; adenovirus type 2 survived from 3-8 weeks on environmental surfaces at room temperature

## SECTION V - MEDICAL

**SURVEILLANCE:** Monitor for symptoms; confirm by serological analysis

**FIRST AID/TREATMENT:** Mainly supportive therapy

**IMMUNIZATION:** Vaccine available for adenovirus types 4 and 7 (used for military recruits)

**PROPHYLAXIS:** None available

## SECTION VI - LABORATORY HAZARDS

**LABORATORY-ACQUIRED INFECTIONS:** Ten cases documented up to 1988

**SOURCES/SPECIMENS:** Respiratory secretions

**PRIMARY HAZARDS:** Ingestion; droplet exposure of the mucous membrane

**SPECIAL HAZARDS:** Contact with feces from infected animals

## SECTION VII - RECOMMENDED PRECAUTIONS

**CONTAINMENT REQUIREMENTS:** Biosafety level 2 practices and containment facilities for all activities involving the virus and potentially infectious body fluids or tissues

**PROTECTIVE CLOTHING:** Laboratory coat; gloves when skin contact with infectious materials is unavoidable

**OTHER PRECAUTIONS:** None

## SECTION VIII - HANDLING INFORMATION

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

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

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

## SECTION IX - MISCELLANEOUS INFORMATION

**Date prepared:** November 1999

**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: 2001-01-23



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

Product code V49320  
 Product name pAd/CMV/V5-DEST™ Gateway® Vector

**Contact manufacturer**  
 INVITROGEN CORPORATION  
 1600 FARADAY AVENUE  
 PO BOX 6482  
 CARLSBAD, CA 92008  
 760-603-7200

Info on Vector(s)

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

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

**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

**3. HAZARDS IDENTIFICATION**

**Emergency Overview**

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	No information available
Skin	No information available
Inhalation	No information available
Ingestion	No information available

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

#### 4. FIRST AID MEASURES

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

#### 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media Dry chemical  
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

#### 7. HANDLING AND STORAGE

Handling No special handling advice required  
Storage 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 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 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 No information available

### 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

### U.S. Federal Regulations

#### **SARA 313**

Not regulated

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

This product contains the following HAPs:

### U.S. State Regulations

#### **California Proposition 65**

This product contains the following Proposition 65 chemicals:

#### **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 PARTICULAR PURPOSE.

**End of Safety Data Sheet**

# Info on Cell Line(s)

## Cell Biology

ATCC® Number: **CRL-1573™**  Price: **\$279.00**

Designations: 293 [HEK-293]  
Depositors: FL Graham  
Biosafety Level: 2 [CELLS CONTAIN ADENOVIRUS ]  
Shipped: frozen  
Medium & Serum: See Propagation  
Growth Properties: adherent  
Organism: *Homo sapiens* (human)

epithelial

Morphology:



Source: **Organ:** embryonic kidney  
**Cell Type:** transformed with adenovirus 5 DNA

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: These cells are distributed for research purposes only. 293 cells, their products, or their derivatives may not be distributed to third parties.

Applications: efficacy testing [92587]  
transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents)  
virucide testing [92579]

Receptors: vitronectin, expressed

Tumorigenic: YES  
Amelogenin: X  
CSF1PO: 11,12  
D13S317: 12,14  
D16S539: 9,13

DNA Profile (STR): D5S818: 8,9  
D7S820: 11,12  
THO1: 7,9.3  
TPOX: 11  
vWA: 16,19

Cytogenetic Analysis:

### Related Links ▶

[NCBI Entrez Search](#)

[Cell Micrograph](#)

[Make a Deposit](#)

[Frequently Asked Questions](#)

[Material Transfer Agreement](#)

[Technical Support](#)

[Related Cell Culture Products](#)

### Login Required ▶

[Product Information Sheet](#)

### BioProducts

[Cell, microbial and molecular genomics products for the life](#)

• [sciences BioServices](#)

[Bio-materials management; basic repository to complex](#)

• [partnership-level services BioStandards](#)

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

• [community](#)



# MATERIAL SAFETY DATA SHEET

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

## MATERIAL SAFETY DATA SHEET

### SECTION 1 - SUBSTANCE IDENTITY AND COMPANY INFORMATION

Product Name: Various Animal Cell Cultures at Biosafety Level 1 or 2  
ATCC Catalog #: Various

COMPANY INFORMATION: AMERICAN TYPE CULTURE COLLECTION  
PO BOX 1549  
MANASSAS, VA 20108

FOR INFORMATION CALL: 800-638-6597 or 703-365-2700  
AFTER-HOURS CONTACT: 703-365-2710  
CHEMTREC EMERGENCY: 800-424-9300 or 703-527-3887

### SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

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). Frozen Cultures may also contain a 5%-10% solution of Dimethyl sulfoxide as a cryoprotectant.

### SECTION 3 - HAZARD IDENTIFICATION

HMIS Rating: Health: 0 Flammability: 0 Reactivity: 0  
NFPA Rating: Health: 0 Flammability: 0 Reactivity: 0

This substance is not hazardous as defined by OSHA 29CFR 1910.1200 however this product should be handled according to good lab practices, with proper personal protective equipment, proper engineering controls and within the parameters of the purchaser's safety program.

#### Health Hazards

##### For Biosafety Level 1 Cell Cultures

Handle as a potentially biohazardous material under at least Biosafety Level 1 containment.

This cell line is not known to cause disease in healthy adult humans. These cells have **NOT** been screened for Hepatitis B, human immunodeficiency viruses or other adventitious agents, unless otherwise reported on the Certificate of Analysis. Regardless of results reported on the Certificate of Analysis Universal Precautions according to 29 CFR 1910.1030 should be followed at all times when manipulating these cell lines.

See next page for Biosafety Level 2 cell cultures.



## MATERIAL SAFETY DATA SHEET

### For Biosafety Level 2 Cell Cultures

Handle as a potentially biohazardous material under at least Biosafety Level 2 containment.

These cell lines are associated with human disease, hazards include: percutaneous injury, ingestion, mucous membrane exposure (U.S. Government Publication **Biosafety in Microbiological and Biomedical Laboratories**). These cells have **NOT** been screened for Hepatitis B, human immunodeficiency viruses or other adventitious agents, unless otherwise reported on the Certificate of Analysis. Regardless of results reported on the Certificate of Analysis Universal Precautions according to 29 CFR 1910.1030 should be followed at all times when manipulating these cell lines.

### SECTION 4 - FIRST AID MEASURES

**Report to your Safety Office and Seek Medical Attention as Soon as Possible**

**Ingestion:** If person is unconscious seek emergency medical attention; never give anything by mouth to an unconscious person. If the person is conscious wash mouth out with copious amounts of water and call a physician then administer three cupfuls of water. Do not induce vomiting unless directed to do so by a physician.

**Inhalation:** If person is unconscious seek emergency medical attention, if person is conscious remove to fresh air and call a physician.

**Dermal exposure:** Immediately wash skin with copious amounts of water followed by washing with soap and copious amounts of water. Remove all contaminated clothing.

**Eye exposures:** Flush eyes with copious amounts of water for at least 15 minutes with eyelids separated and call a physician.

### SECTION 5 - FIRE FIGHTING MEASURES

**Flammability:** Data not available

**Suitable Extinguishing Media:** Water spray, carbon dioxide, dry chemical powder, Halon (where regulations permit), or appropriate foam.

**Protective Equipment:** Wear self-contained breathing apparatus and protective clothing to prevent inhalation, ingestion, skin and eye contact.

**Specific Hazard(s):** Responders should take into consideration the biohazard risk associated with responding to a fire in the area where the material may be stored or handled.



## MATERIAL SAFETY DATA SHEET

### SECTION 6 - ACCIDENTAL RELEASE MEASURES

**Procedure(s) of Personal Precaution(s):** At a minimum use PPE listed in Section 8. Wear laboratory coat, gloves and eye protection. Avoid all contact.

#### Methods for Cleaning Up

**Patient/Victim:** Wash with soap and water. Work clothes should be laundered separately. Launder contaminated clothing before re-use. Do not take clothing home.

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

**Note:** The use of additional PPE may be necessary for cleaning solutions.

### SECTION 7 - HANDLING AND STORAGE

Handle and store according to instructions on product information sheet and label.

Special Requirements:

Follow established laboratory procedures when handling material.

### SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

**Use Personal Protective Equipment:** Including Eye Protection, Chemical Resistant Gloves, and appropriate clothing to prevent skin exposure. In addition, a Respiratory protection program that complies with OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

**Engineering Controls:** The use and storage of this material requires user to maintain and make available appropriate eyewash and safety shower facilities. Use fume hood or other appropriate ventilation method to keep airborne concentrations as low as possible.

**Exposure Limits:** No exposure limits for this material have been established by ACGIH, NIOSH, or OSHA.

### SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Data Not Available

### SECTION 10 - STABILITY AND REACTIVITY

Hazardous polymerization will not occur.

### SECTION 11 - TOXICOLOGICAL INFORMATION

#### Route of Exposure

American Type Culture Collection  
P.O. Box 1549  
Manassas, VA 20108  
July 2010

Emergency Telephone: (703) 365-2710 (24 hours)  
Information Telephone: (703) 365-2700 Ext.2303

Chemtec (800) 424-9300



## MATERIAL SAFETY DATA SHEET

**Eye Contact:** Data not available. Avoid eye contact.  
**Skin Contact:** Data not available. Avoid skin contact.  
**Skin Absorption:** Data not available. Avoid skin absorption.  
**Inhalation:** Data not available. Avoid inhalation.  
**Ingestion:** Data not available. Avoid ingestion.  
**Parenteral Exposure:** Data not available. Avoid parenteral exposure.

**Sensitization**  
**Skin:** Data not available  
**Respiratory:** Data not available

**Target Organ(s) or System(s):** Data not available

**Signs and Symptoms of Exposure**  
**Skin and Mucous Membranes:** Data not available  
**Respiratory:** Data not available  
**Gastrointestinal:** Data not available

**Toxicity Data:** Data not available  
**Effects of Long Term or Repeated Exposure:** Data not available  
**Chronic Exposure-Teratogen:** Data not available  
**Chronic Exposure-Mutagen:** Data not available  
**Chronic Exposure-Reproductive Hazard:** Data not available

<b>SECTION 12 -</b>	<b>ECOLOGICAL INFORMATION</b>
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No ecological information available.

<b>SECTION 13 -</b>	<b>DISPOSAL CONSIDERATIONS</b>
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Decontaminate all wastes before disposal (steam sterilization, chemical disinfection, and/or incineration).  
Dispose of in accordance with applicable regulations.

<b>SECTION 14 -</b>	<b>TRANSPORT INFORMATION</b>
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Contact ATCC for transport information.

<b>SECTION 15 -</b>	<b>REGULATORY INFORMATION</b>
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Contact ATCC for regulatory information.

<b>SECTION 16 -</b>	<b>OTHER INFORMATION</b>
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## MATERIAL SAFETY DATA SHEET

THE INFORMATION PRESENTED IN THIS DOCUMENT IS BELIEVED TO BE CORRECT BASED UPON DATA AVAILABLE TO ATCC. USERS SHOULD MAKE AN INDEPENDENT DECISION REGARDING THE ACCURACY OF THIS INFORMATION BASED ON THEIR NEEDS AND DATA AVAILABLE TO THEM. ALL SUBSTANCES AND MIXTURES MAY PRESENT UNKNOWN HAZARDS AND ALL NECESSARY SAFETY PRECAUTIONS SHOULD BE TAKEN. ATCC ASSUMES NO LIABILITY RESULTING FROM USING OR COMING IN CONTACT WITH THIS SUBSTANCE.