

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

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

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

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

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

PRINCIPAL INVESTIGATOR	<u>Trevor Shepherd</u>
DEPARTMENT	<u>Cancer Research Laboratory Program</u>
ADDRESS	<u>790 Commissioners Rd E A4-921</u>
PHONE NUMBER	<u>519-685-8500 56347 (office) 53626 (lab)</u>
EMERGENCY PHONE NUMBER(S)	<u>519-349-2057 (home)</u>
EMAIL	<u>tshephe6@uwo.ca</u>

Location of experimental work to be carried out: Building(s) LHSC/LRCP Room(s) A4-921, -908

\*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: (1) CCSRI (2) LRCP Small Grants  
 GRANT TITLE(S): (1) Implications of activated BMP signalling and ID1/ID3 function in ovarian cancer pathogenesis; (2) Myxoma virus mediated oncolysis as a novel therapeutic for epithelial ovarian cancer

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>Teresa Peart</u>	<u>Teresa.peart@gmail.com</u>	<u>Incomplete</u>
<u>Rohann Correa</u>	<u>Rcorrea4@uwo.ca</u>	<u>October 2008</u>
<u>Jason Reed</u>	<u>Jreed7@uwo.ca</u>	<u>September 2009</u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
<u> </u>	<u> </u>	<u> </u>
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<u> </u>	<u> </u>	<u> </u>

**Incomplete training**

**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.**

#### Cell lines

Numerous established cell lines are used in my laboratory including SkOV3, SkOV3-ip1, OVCA429, OCC-1, HeyC2, OVCAR3, CaOV3, 293T, 293A, IOSE80, vOSE-14, which are all human cell lines, and 4306, MOSE-RM, MASC2, which are mouse cell lines, and BGMK cells which are non-human primate cells. Frozen vials are stored at -150C until use. They are grown at 37C in 5% CO2 in humidified incubators in our cell culture room (LRCP A4-908). Any waste from culture of these cells disposed of into biohazardous waste containers kept in the cell culture room, which are then sealed to be autoclaved/incinerated.

#### Primary Cell Culture

Ovarian cancer cells are cultured directly from patients treated at the LHSC and LRCP hospitals. All processing and culture occurs in the cell culture room LRCP A4-908. Excess patient fluids/tissues are bleached and disposed of in sealed biohazardous waste containers for pickup and autoclave/incineration. Frozen vials are stored at -150C until use. Any waste from culture of these materials is disposed of into biohazardous waste containers kept in the cell culture room, which are then sealed to be autoclaved/incinerated.

#### Viruses

Two types of viruses are currently used in the laboratory in cell culture experiments: recombinant human adenovirus and myxoma virus. All adenovirus constructs are derived from Ad5 serotype and have mutations that render them non-infectious and non-replicating. No adenovirus vector expresses an oncogene or disease-causing agents.

The myxoma virus currently being used was derived by our collaborator Dr. Grant McFadden (U. of Florida Gainesville). This virus has mutations that make it less pathogenic to its natural host the European rabbit. It is non-pathogenic to humans. Our lab has had PHAC approval to import vials of the virus from the USA, and we now routinely make our own virus in the lab using the BGMK cell line.

All viruses are stored at -80C.

All virus work is performed in the Level 2 room A4-908 and in a Class A/B2 biological safety cabinet.

All unused virus is bleached and transferred directly to biohazardous waste in the cell culture room A4-908 to be subsequently sealed and autoclaved/incinerated.

#### Transformed bacteria

Our lab uses E. coli DH5alpha cells to transform plasmids for routine molecular biology and DNA cloning strategies. The standard vectors we use are the pSCA vector (Stratagene) for cloning PCR products, and pcDNA3.0 for expressing genes in mammalian cells. No oncogene is cloned or expressed in cells using these vectors.

Stocks of transformed bacteria are kept at -80C until use.

Temporary storage of transformed bacterial cultures are kept at 4C in A4-921

Unused bacteria are bleached and disposed of directly into biohazardous waste containers in A4-921 which are sealed and picked up for autoclave/incineration.

Implications of activated BMP signalling and ID1/ID3 function in ovarian cancer pathogenesis  
SHEPHERD, Trevor Shepherd  
Summary of Research Proposal

This is a new application requesting 5 years of funding to investigate the role of bone morphogenetic protein (BMP) signalling and its direct downstream targets *ID1* and *ID3* proto-oncogenes on the etiology of human epithelial ovarian cancer (EOC). EOC is the sixth most prevalent cancer amongst women and is the most lethal of the gynaecologic malignancies. Key to identifying new prognostic indicators and therapeutic targets is the discovery of critical molecular determinants for EOC pathogenesis. I have shown that the BMP pathway is highly active in EOC cells, regulates specific tumorigenic properties, and functions through induction of the helix-loop-helix transcriptional repressors ID1 and ID3. In fact, elevated ID1 levels correlate with less differentiation, increased malignant potential, and poor patient prognosis. Consequently, we hypothesize that ***ID1 and ID3 are critically implicated in promoting ovarian cancer pathogenesis downstream from activated BMP signaling.*** We have already developed novel models to study the role of activated BMP signalling and ID1/ID3 overexpression in human EOC cells and in the mouse ovarian surface epithelium (OSE). These models were developed to mimic different aspects of EOC pathogenesis and maximize use of human ovarian cancer patient samples. To this end, our proposal focuses on deciphering the phenotypic consequences of modulating BMP signalling and ID1/ID3 protein expression in human EOC cells cultured as 3D spheroids, as xenografts on the chick embryo chorioallantoic (CAM) membrane and in the mouse OSE using mouse transgenesis, and:

**1) The role of activated BMP signalling and its downstream targets ID1/ID3 in an in vitro 3D tumour model of EOC.** The majority of EOC patients with metastatic disease present with ascites containing malignant EOC cells, which can exist as multicellular spheroids. Thus, we will model metastatic EOC *in vitro* by culturing primary EOC cells in suspension whereby these cells autonomously form spheroids. Recombinant viral transduction of ascites-derived primary EOC cells will be employed to determine how activated BMP signalling and ID1/ID3 overexpression facilitate EOC spheroid formation, cell growth and viability, adhesion, motility, and invasion. In addition, the potential role of BMP signalling and ID1/ID3 function in modulating the presence and proportion of putative EOC initiating cells will be investigated using this spheroid culture system.

**2) Development of the chick chorioallantoic membrane (CAM) model system to assess consequences of altered BMP signalling and ID1 and ID3 activity in primary human EOC cells.** The chick CAM model has not been used previously to assess the tumorigenic properties of primary human EOC cells. Our preliminary data demonstrates that human EOC cells form tumours and stimulate regions of neovascularization and haemorrhage on the CAM. Thus, we will exploit this system to determine how BMP signalling and ID1/ID3 proteins regulate EOC tumour growth, neovascularization, haemorrhage, and transcriptome changes accompanying distinct stages of tumour formation. The development of this *ex vivo* human EOC cell bioassay utilizing patient samples provides unique long term opportunities to rapidly test novel therapeutics in EOC.

**Transgenic mouse models to investigate activated BMP signalling and ID1 function in early EOC pathogenesis.** We have already generated transgenic mice using the *Mullerian inhibiting substance type II receptor (MISIR)* gene promoter to elevate ID1 in the mouse OSE as seen in human EOC. The OSE of the human ovary is considered the cell of origin for EOC. Therefore, this transgenic approach will directly test the oncogenic potential of ID1 *in vivo*. This approach will also be used to generate transgenic mice with a constitutively-active mutant ALK3 receptor in the murine OSE because it takes into consideration additional gene targets induced by BMP signalling. Transgene expression is expected to result in significant histopathological changes in the OSE mimicking pre-neoplastic events in EOC. These mouse models will be invaluable for future *in vivo* studies on the interaction between BMP signalling and other oncogenes to cause overt tumorigenesis in the OSE.

**These Aims will define the role of BMP signalling and ID1/ID3 function in EOC pathobiology, develop novel research models, and potentially identify new and important therapeutic targets.**

**1.0 Microorganisms**

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

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

If YES, please give the name of the species. Myxoma virus

What is the origin of the microorganism(s)? Dr. G. McFadden, U of Florida Gainesville

Please describe the risk (if any) of escape and how this will be mitigated: only infectious in European rabbits; the virus strain we use has mutation in gene to render less pathogenic in rabbits

Please attach the CFIA permit.

Please describe any CFIA permit conditions:

Import permit is attached

1.2 Please complete the table below:

Name of Biological agent(s)*	Is it known to be a human pathogen? YES/NO	Is it known to be an animal pathogen? YES/NO	Is it known to be a zoonotic agent? YES/NO	Maximum quantity to be cultured at one time? (in Litres)	Source/ Supplier	PHAC or CFIA Containment Level
vMyxGFP	<input type="radio"/> Yes <input checked="" type="radio"/> No	<input checked="" type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input checked="" type="radio"/> No	0.1	Dr. G. McFadden	<input type="radio"/> 1 <input type="radio"/> 2 <input checked="" type="radio"/> 2+ <input type="radio"/> 3
	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No	<input type="radio"/> Yes <input type="radio"/> No			<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
						<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
						<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3

**E. coli, Adenovirus  
See Section 4**

\*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 checked="" type="radio"/> Yes <input type="radio"/> No	Ovarian cancer ascites fluid	Not applicable
Rodent	<input checked="" type="radio"/> Yes <input type="radio"/> No	Ovarian surface epithelial cells	2007-022
Non-human primate	<input type="radio"/> Yes <input type="radio"/> No		
Other (specify)	<input type="radio"/> Yes <input type="radio"/> No		

Level 2

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Supplier / Source
Human	<input checked="" type="radio"/> Yes <input type="radio"/> No	SkOV3, SkOV3-ip1, OVCA429, OCC-1, HeyC2, OVCAR3, CaOV3, 293T, 293A, IOSE80, vOSE-14	ATCC; G. Mills MD Anderson Cancer Centre; B. Vanderhyden U of Ottawa; C. Conover; Mayo Clinic; N. Auersperg UBC
Rodent	<input checked="" type="radio"/> Yes <input type="radio"/> No	4306, MOSE-RM, MASC2	D. Dinulescu Brigham & Womens Hospital; B. Vanderhyden U of Ottawa
Non-human primate	<input checked="" type="radio"/> Yes <input type="radio"/> No	BGMK	G. McFadden U of Florida
Other (specify)	<input type="radio"/> Yes <input type="radio"/> 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/NO	Name of Infectious Agent (If applicable)	PHAC or CFIA Containment Level (Select one)
Human Blood (whole) or other Body Fluid	LHSC/LRCP	<input type="radio"/> Yes <input checked="" type="radio"/> Unknown		<input type="radio"/> 1 <input checked="" type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
Human Blood (fraction) or other Body Fluid		<input type="radio"/> Yes <input type="radio"/> Unknown		<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
Human Organs or Tissues (unpreserved)	LHSC	<input type="radio"/> Yes <input checked="" type="radio"/> Unknown		<input type="radio"/> 1 <input checked="" type="radio"/> 2 <input type="radio"/> 2+ <input type="radio"/> 3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

**4.0 Genetically Modified Organisms and Cell lines**

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

E. coli

... be done?  YES, complete table below  NO

Plasmid	Gene Transfected	Describe the change that results from transformation or tranfection
pcDNA3.0 pSCA	Invitrogen Stratagene	Only ALK3QD virus renders phenotypic

				changes to cells, including cell adhesion, motility, and differentiation
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\* Please attach a Material Data Sheet or equivalent if available.

\*\* Please attach a plasmid map.

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

Virus Used for Vector Construction	Vector(s) *	Source of Vector	Gene(s) Transduced	Describe the change that results from transduction
Human adenovirus	Recombinant Ad5 (AdEasy)	Qbiogene	GFP, lacZ, Cre recombinase, ALK3QD, ID1 and ID3	Only ALK3QD virus renders phenotypic changes to cells, including cell adhesion, motility, and 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 \_\_\_\_\_  NO

4.5 Will virus be replication defective?  YES  NO

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

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

**5.0 Human Gene Therapy Trials**

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

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

See E-mail

5.2 Will the biological agent be able to replicate in the host?

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 *Mus musculus* (mouse)

6.3 AUS protocol # 2007-022 (DiMattia is PI and Shepherd is co-PI)

6.4 Will any of the agents listed in section 4.0 be used in live animals  YES, specify: Ad-GFP, Ad-Cre  NO

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

\_\_\_\_\_

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

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

7.2 Please specify the animal(s) used:

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

**8.0 Biological Toxins**

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

8.2 If YES, please name the toxin(s) \_\_\_\_\_  
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:  
\_\_\_\_\_

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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: \_\_\_\_\_  
\_\_\_\_\_

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

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

**11.0 Import Requirements**

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

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

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

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

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

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

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

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

SIGNATURE 

**13.0 Containment Levels**

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

O 1 O 2 **X 2+** O 3

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

*certified Dec. 2010  
 by GAIL RYDER  
 Mail Ryder*

**14.0 Procedures to be Followed**

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

SIGNATURE

Date: December 17, 2010

14.2 Please describe additional risk reduction measures will be taken beyond containment level 1, 2, 2+ or 3 measures, that are unique to this agent.  
 Standard operating procedures for these agents (i.e. use and disposal) at each containment level are sufficient to reduce risks to health and safety of personnel.

14.3 Please outline what will be done if there is an exposure to the biological agents listed, such as a needlestick injury:  
 Occupational Health & Safety at the LHSC will be contacted immediately; however, the agents to be used are not infectious to humans and are not zoonotic in nature

**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: *Mail Ryder*  
 Date: *Jan 5, 2011*

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

Special Conditions of Approval:



Canadian Food Inspection Agency  
Government of Canada

Agence canadienne d'inspection des aliments  
Gouvernement du Canada

Permit No./N° de permis:  
A-2009-03324-4  
ORIGINAL  
2009/07/23  
year/mo/day  
année/mois/jour

IMPORT PERMIT

PERMIS D'IMPORTATION

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THIS PERMIT IS ISSUED PURSUANT TO/CE PERMIS EST DÉLIVRÉ CONFORMÉMENT A:

<b>THE HEALTH OF ANIMALS ACT AND REGULATIONS/LOI ET RÈGLEMENT SUR LA SANTÉ DES ANIMAUX</b>	
<b>Importer/Importateur</b> LONDON HEALTH SCIENCES CENTRE  LONDON REGIONAL CANCER PROGRAM 790 COMM(SSIONERS ROAD EAST LONDON, ONTARIO N6A4L6 Applicant Name: TREVOR G. SHEPHERD Phone: 519-685-8500 EXT 56347 Fax: 519-685-8673 Email: TSHEPPE6@UWO.CA	<b>Exporter/Exportateur</b> UNIVERSITY OF FLORIDA  1600 S.W. ARCHER ROAD DEPARTMENT OF MOLECULAR GENETICS & MICROBIOLOGY GAINESVILLE, FLORIDA UNITED Contact: Dr. Grant McFadden / Sherin Smallwood Phone: (352) 273-6852 Fax: (352) 273-6849
<b>Quarantine/Destination/Quarantaine</b>	<b>Producer/Producteur</b>
<b>Valid/Valide</b> from/du 2009/07/23 to/au 2010/07/31 year/month/day year/month/day année/mois/jour année/mois/jour	<b>Country of Origin/ Pays d'Origine</b> UNITED STATES
<b>For the entry of/ Pour l'entrée de:</b> Single shipment/Chargement simple <u>XX</u> Multiple shipments/Chargements multiples	
<b>Place of entry into Canada/Lieu d'entrée au Canada:</b> ALL REGULATED PORTS	
<b>FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE:</b> (Description of things(s)/Description de la ou des choses) 1. Product Description: MYXOMA VIRUS - PLEASE SEE ADDITIONAL CONDITIONS AT THE END OF THIS PERMIT.  (TO BE USED IN VITRO ONLY IN ROOM A4-908, CANCER RESEARCH LABORATORY, LONDON HEALTH SCIENCES CENTRE, LONDON, ON) Proposed End Use: "In Vitro" Scientific Name: Biocontainment Level: 2	
<b>A PERSON WHO IMPORTS A THING UNDER THIS PERMIT SHALL COMPLY WITH ALL THE CONDITIONS SET OUT HEREIN/TOUTE PERSONNE QUI IMPORTE UNE CHOSE EN VERTU DE CE PERMIS DEVRA RESPECTER TOUTES LES CONDITIONS DÉCRITES CI-DESSOUS</b>	

Selected Conditions / Conditions Choies

MYXOMA VIRUS - PLEASE SEE ADDITIONAL CONDITIONS AT THE END OF THIS PERMIT.

(TO BE USED IN VITRO ONLY IN ROOM A4-908, CANCER RESEARCH LABORATORY, LONDON HEALTH SCIENCES CENTRE, LONDON, ON)

- The original or a copy of the signed original of this permit and any other necessary import / export documentation pertaining to the shipment of animal(s) or thing(s) must be provided for inspection at the first port of entry or to a Canadian Food Inspection Agency Import Service Center.
- The conditions in this permit can only be changed or amended by a CFIA Inspector. Any change to the permit by an unauthorized person will render the permit invalid.
- The imported material must be packaged in appropriate shipping containers to prevent accidental spillage of contents during shipping. Importers should be aware of their obligations under Transport Canada's regulations concerning transportation of dangerous goods.

Canadian Food Inspection Agency  
Government of Canada

Agence canadienne d'inspection des aliments  
Gouvernement du Canada

Permit No./N° de permis:  
A-2009-03324-4  
ORIGINAL  
2009/07/23  
year/month/day  
année/mois/jour

**IMPORT PERMIT**

**PERMIS D'IMPORTATION**

Page 2 of 3

THIS PERMIT IS ISSUED PURSUANT TO/CE PERMIS EST DÉLIVRÉ CONFORMÉMENT A:

THE HEALTH OF ANIMALS ACT AND REGULATIONS/LOI ET RÈGLEMENT SUR LA SANTÉ DES ANIMAUX

Importer/Importateur

LONDON HEALTH SCIENCES CENTRE

LONDON REGIONAL CANCER PROGRAM  
790 COMMISSTONERS ROAD EAST  
LONDON, ONTARIO  
N6A4L6

Applicant Name: TREVOR G. SHEPHERD  
Phone: 519-685-8500 EXT 56347 Fax: 519-685-8673  
Email: TSHEPH66@UWO.CA

Exporter/Exportateur

UNIVERSITY OF FLORIDA

1600 S.W. ARCHER ROAD  
DEPARTMENT OF MOLECULAR GENETICS & MICROBIOLOGY  
GAINESVILLE, FLORIDA  
UNITED

Contact: Dr. Grant McFadden / Sherin Smallwood  
Phone: (352) 273-6852 Fax: (352) 273-6849

**Selected Conditions / Conditions Choies (Continued/Suite)**

4. All infectious material must be handled in appropriate animal pathogen containment level 2 facilities as described in Containment Standards for Veterinary Facilities, 1996, AAFC publication no. 1921.
5. The material authorized for importation by this permit is to be used in in vitro studies ONLY and must not to be introduced into laboratory, domestic or wild animals (including birds or fish) unless written authorization is obtained from the Canadian Food Inspection Agency.
6. The animal(s) or thing(s) imported under this permit must NEVER be removed from the premises of destination listed on this permit, even after the animals have been released from their post-import quarantine, unless written authorization is obtained from the Canadian Food Inspection Agency.
7. Upon completion of the tests or experiments, the imported material as described on this permit and any derivatives thereof must be autoclaved, incinerated or alternatively disposed of in a manner approved by an inspector of the Canadian Food Inspection Agency.
8. Records pertaining to the imported product's use, storage and disposal must be maintained for two (2) years following importation. These records must be made available for inspection by the Canadian Food Inspection Agency upon request.
9. The importer is responsible for all costs incurred or associated with any testing or treatment of the animal(s) or thing(s) that may be required under the import permit or under the authority of the Health of Animals Act or the Health of Animals Regulations. The importer shall pay all fees for services required in respect of the importation under the National Animal Health Program Cost Recovery Fees Regulations in place at the time of importation.
10. Consideration of an application necessary for issuance of a permit to import the described animal or thing is subject to Class 1 fees.
11. The issuance of this permit does not relieve the owner or the importer of the obligation to comply with any other relevant federal, provincial or municipal legislation or requirement.
12. Failure to comply with the conditions contained in this permit or with the provisions of the Health of Animals Act and Regulations may result in the cancellation of this permit and will result in the forfeiture to the Crown of the imported thing(s) or in the removal of the thing(s) from Canada, all without compensation to, and at the expense of the importer. The importer(s) are responsible for the imported thing(s), their freedom from extraneous disease, active or latent, and genetic or other defects. The importer, his heirs, executors, successors and assigns release and discharges Her Majesty the Queen in right of Canada and the CFIA of and from all claims and demands, damages, actions or causes of action arising or to arise by reason of the importation of the thing(s) and agrees to indemnify and save harmless Her Majesty the Queen in right of Canada and the CFIA from and against all actions, damages, claims and demands which may be brought in respect of or arising out of the importation of such thing(s), any contamination with extraneous disease or other defects.

Canadian Food Inspection Agency  
Government of Canada

Agence canadienne d'inspection des aliments  
Gouvernement du Canada

**Permit No./N° de permis:**  
A-2009-03324-4  
**ORIGINAL**  
2009/07/23  
year/mo/day  
année/mois/jour

**IMPORT PERMIT**

**PERMIS D'IMPORTATION**

Page 3 of/de 3

THIS PERMIT IS ISSUED PURSUANT TO:/CE PERMIS EST DÉLIVRÉ CONFORMÉMENT A:

THE HEALTH OF ANIMALS ACT AND REGULATIONS/LOI ET RÈGLEMENT SUR LA SANTÉ DES ANIMAUX	
<u>Importer/Importateur</u> LONDON HEALTH SCIENCES CENTRE  LONDON REGIONAL CANCER PROGRAM 790 COMMISSIONERS ROAD EAST LONDON, ONTARIO N6A4L6 Applicant Name: TREVOR G. SHEPHERD Phone: 519-685-8500 EXT 56347 Fax: 519-685-8673 Email: TSHEPHE6@UWO.CA	<u>Exporter/Exportateur</u> UNIVERSITY OF FLORIDA  1600 S.W. ARCHER ROAD DEPARTMENT OF MOLECULAR GENETICS & MICROBIOLOGY GAINESVILLE, FLORIDA UNITED Contact: Dr. Grant McFadden / Sherin Smallwood Phone: (352) 273-6852 Fax: (352) 273-6849

**Selected Conditions / Conditions Choies (Continued/Suite)**

**Additional Conditions Additionnelles**

MYXOMA VIRUS - PLEASE SEE ADDITIONAL CONDITIONS AT THE END OF THIS PERMIT.

(TO BE USED IN VITRO ONLY IN ROOM A4-908, CANCER RESEARCH LABORATORY, LONDON HEALTH SCIENCES CENTRE, LONDON, ON)

1. Employees must not visit farms, rabbitries or petting zoos for at least 14 days after working in the laboratory with live myxomavirus.
2. Employees working in this laboratory must not handle domestic or wild rabbits.
3. All activities with infectious materials are conducted in a biological safety cabinet.
4. Personal items such as purses and outdoor clothing must not be brought into the laboratory zone (otherwise it must be entirely decontaminated before it leaves the laboratory zone).
5. Personnel entering the laboratory zone must wear lab coats, hair nets and dedicated shoes. Contaminated clothing must be decontaminated prior to laundering.
6. Where a known or suspected aerosol exposure has occurred (e.g. dropping infectious materials) a shower is required on exit from the laboratory zone.
7. Research must not be performed on any animals without prior approval from the OBCS, CPIA.
8. This import permit must be read by personnel; employees must certify in writing that they have understood the conditions of this permit and will abide by them.

*Cynthia Labrie*  
Authorized By:/Approuvé par:  
CYNTHIA LABRIE

For the Minister of Agriculture and Agri-Food  
Pour le ministre d'agriculture et agroalimentaire

The information is required by (for) the Canadian Food Inspection Agency for the purpose of verifying import products. Information may be accessible or protected as required under the provisions of the Access to Information Act.



**VECTOR BIOLABS**  
THE ADENOVIRUS COMPANY

**MATERIAL SAFETY DATA SHEET**

EMERGENCY TELEPHONES: 1- 877-Biolabs 1-215-966-6045

<http://www.vectorbiolabs.com>

**MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES**

**SECTION I - INFECTIOUS AGENT**

**PRODUCT IDENTIFICATION:**

All pre-made adenovirus made by Vector BioLabs.

**BIOLOGICAL NAME:** Adenovirus - Type 5

**CHARACTERISTICS:** Adenoviridae; non-enveloped, icosahedral virions, 75-80 nm diameter, doublestranded, linear DNA genome. The recombinant viruses are based on human adenoviral backbone which is deleted in the essential E1 gene as well as the E3 gene. The viruses produced are thus non-replicative.

**SECTION II - HEALTH HAZARD**

**PATHOGENICITY:** Varies in clinical manifestation and severity; symptoms include fever, rhinitis, pharyngitis, cough and conjunctivitis. The risk from infection by defective recombinant adenoviral vectors depends both on the dose of virus and on the nature of the transgene. Adenovirus does not integrate into the host cell genome but can produce a strong immune response.

**HOST RANGE:** Humans and animals

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

**MODE OF TRANSMISSION:** In the laboratory, care must be taken to avoid spread of infectious material by aerosol, direct contact or accidental injection

**CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN:** None

**SECTION III - VIABILITY**

**DRUG SUSCEPTIBILITY:** No specific antiviral available

**SUSCEPTIBILITY TO DISINFECTANTS:** Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde. Recommend use of 1/3 volume of bleach for 30 minutes.

**PHYSICAL INACTIVATION:** Sensitive to heat; 1 hour at 56°C is used to inactivate virus.

**SURVIVAL OUTSIDE HOST:** Adenovirus type 5 survived from 3-8 weeks on environmental surfaces at room temperature.

**SECTION IV - MEDICAL**

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

**FIRST AID/TREATMENT:**

Contact: Immediately flush eyes and skin with plenty of water for at least 15 minutes. Call a physician.

Inhalation: N/A

Ingestion: Wash out mouth with water. Call a physician

Accidental injection: wash area with soap and water. Call a physician.

### ***SECTION V – ACCIDENTAL RELEASE PROCEDURES***

Pour 1 volume of Javel water over the leak(s) and wait for 15 minutes.

Wipe up carefully.

Hold for autoclave waste disposal and decontaminate work surfaces with 70% alcohol.

### ***SECTION VI - RECOMMENDED PRECAUTIONS***

**CONTAINMENT REQUIREMENTS:** Biosafety level 2 practices and containment facilities for all activities involving the virus and potentially infectious body fluids or tissues. This level consists of etiological agents considered to be of ordinary potential harm.

**PROTECTIVE CLOTHING:** Recombinants Adenovirus: Laboratory coat; gloves.

#### **OTHER PRECAUTIONS:**

Access to the laboratory is limited.

Work surfaces are decontaminated before and after each procedure

Mechanical pipetting devices are used for all procedures; mouth pipetting is prohibited.

Eating, drinking, and smoking are not permitted in the laboratory; food is not stored in laboratory areas.

Laboratory coats are worn in and are removed before leaving the laboratory.

Hands are washed before and after handling virus.

### ***SECTION VII - HANDLING INFORMATION***

**DISPOSAL:** Decontaminate all wastes before disposal; steam sterilization

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

### ***SECTION VIII - MISCELLANEOUS INFORMATION***

The above information and recommendations are believed to be accurate and represent the most complete information currently available to us. All materials and components may present unknown hazards and should be used with caution. Vector BioLabs, Inc assumes no liability resulting from use of the above products.

*Date of revision: May 24, 2004*

**1. PRODUCT AND COMPANY INFORMATION**

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

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

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

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

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

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

**NON-EMERGENCY INFORMATION:**

Product Name: LIBRARY EFFICIENCY DH5ALPHA COMPETENT CELLS  
 Stock Number: 18263012

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

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

Synonyms:  
 Not available.

**2. COMPOSITION, INFORMATION ON INGREDIENTS**

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

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

MATERIAL SAFETY DATA SHEET

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LIBRARY EFFICIENCY DHSALPHA COMPETENT CELLS	Revised	9/30/03
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MSDS ID: 18263	Printed	9/30/03

**3. HAZARDS IDENTIFICATION**

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

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

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

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

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

Chronic:  
 No data on cancer.

**4. FIRST AID MEASURES**

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

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

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

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

MATERIAL SAFETY DATA SHEET

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

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

Note To Physician:  
Treat symptomatically.

**5. FIRE FIGHTING MEASURES**

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

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

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

Hazardous Combustion Products:  
 Carbon dioxide Carbon monoxide Sulfur containing gases

**6. ACCIDENTAL RELEASE MEASURES**

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

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

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

**7. HANDLING AND STORAGE**

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

Storage Pressure:  
 Ambient

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

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

**8. EXPOSURE CONTROLS, PERSONAL PROTECTION**

Exposure Limits:  
 Component  
 DIMETHYL SULFOXIDE

OSHA PEL (ppm) Not established.	ACCIH TWA (ppm) Not established.
---------------------------------------	--

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

Personal Protective Equipment:

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



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 LIBRARY EFFICIENCY DHSALPHA COMPETENT CELLS Revised 9/30/03  
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**10. STABILITY AND REACTIVITY (CONT.)**

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

Hazardous Decomposition Products:  
 Carbon monoxide. Carbon dioxide. Sulfur containing gases.

Hazardous Polymerization:  
 Hazardous polymerization will not occur.

**11. TOXICOLOGICAL INFORMATION**

Acute Toxicity:

Dermal/Skin:  
 DIMETHYL SULFOXIDE: 40 GM/KG

Inhalation/Respiratory:  
 Not determined.

Oral/Ingestion:  
 DIMETHYL SULFOXIDE: 14,500 MG/KG

Target Organs: Blood. Eyes. Skin.

Carcinogenicity:

NTP:  
 Not tested.

IARC:  
 Not listed.

OSHA:  
 Not regulated.

Other Toxicological Information

**12. Ecological Information**

Ecotoxicological Information: No ecological information available.

Environmental Fate (Degradation, Transformation, and Persistence):  
 Bioconcentration is not expected to occur.  
 Biodegrades slowly.

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**13. DISPOSAL CONSIDERATIONS**

Regulatory Information:  
 Not applicable.

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

**14. TRANSPORT INFORMATION**

Proper Shipping Name: Not Determined.  
 Subsidiary Hazards:

**15. REGULATORY INFORMATION**

UNITED STATES:

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

Prop 65 Listed Chemicals: PROP 65 PERCENT  
 No Prop 65 Chemicals.

No 313 Chemicals

CANADA:

DSL/NDSL:  
 Not determined.

COMPONENT WHMIS Classification  
 DIMETHYL SULFOXIDE D2B

EUROPEAN UNION:

PRODUCT RISK PHRASES: None assigned.

PRODUCT SAFETY PHRASES: Not applicable.

PRODUCT CLASSIFICATION: Not applicable.

MATERIAL SAFETY DATA SHEET

LIBRARY EFFICIENCY DHSALPHA COMPETENT CELLS  
 INVITROGEN CORPORATION  
 MSDS ID: 18263

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

Not classified

Component  
 DIMETHYL SULFOXIDE

EINECS  
 Number  
 200-664-3

**16. OTHER INFORMATION**

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

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

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



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

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

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

Ms. Shamila Survery / Mr. Michael Decosimo  
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            | • W3110        |
| • C25         | • HB101            | • LE451   | • SuperchargeEZ10 | • WG1          |
| • C41 (DE3)   | • HS(PFAMP)R       | • LE452   | • SURE            | • WG439        |
| • C43 (DE3)   | • Hfr3000          | • MB408   | • TOP10           | • WG443        |
| • C600        | • Hfr3000 X74      | • MBX1928 | • TG1             | • WG445        |
| • Cavalli Hfr | • HMS174           | • MC1061  |                   |                |

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

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

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

Sincerely,

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

# Cell Line Info

## Cell Biology

ATCC® Number: **CRL-1573™** Order this Item Price: **\$256.00**

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

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.

Permits/Forms:

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

Amclogenin: 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](#)

## Cell Biology

ATCC® Number: **HTB-77™**  Price: **\$272.00**

Designations: **SK-OV-3 [SKOV-3]**

Depositors: G Trempe, LJ Old

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Homo sapiens* (human)

Morphology: epithelial

Source: **Organ:** ovary  
**Disease:** adenocarcinoma  
**Derived from metastatic site:** ascites

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

Restrictions: The cells are distributed for research purposes only. The Memorial Sloan-Kettering Cancer Center releases the line subject to the following: 1.) The cells or their products must not be distributed to third parties. Commercial interests are the exclusive property of Memorial Sloan-Kettering Cancer Center. 2.) Any proposed commercial use of these cells must first be negotiated with The Director, Office of Industrial Affairs, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021; phone (212) 639-6181; FAX (212) 717-3439.

Isolation: **Isolation date:** 1973

Applications: transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents)

Tumorigenic: Yes

Antigen Expression: Blood Type B; Rh+

**Related Links ▶**

[NCBI Entrez Search](#)

[Make a Deposit](#)

[Frequently Asked Questions](#)

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**BioProducts**

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**BioServices**

[Bio-materials management;](#)

[basic](#)

[repository to complex](#)

[partnership-level services](#)

## Cell Biology

ATCC® Number: **HTB-161™** Order this Item Price: **\$272.00**

Designations: **NIH:OVCAR-3**

Depositors: R Ozols, TC Hamilton

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Homo sapiens* (human)  
epithelial

Morphology:



**Organ:** ovary

Source: **Disease:** adenocarcinoma

**Cell Type:** epithelial

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.

Permits/Forms:

Isolation: **Isolation date:** 1982

Applications: transfection host (Roche FuGENE® Transfection Reagents)

Receptors: androgen receptor, positive; estrogen receptor, positive;  
progesterone receptor, positive

Tumorigenic: Yes

Amelogenin: X  
CSF1PO: 11,12  
D13S317: 12  
D16S539: 12

DNA Profile (STR): D5S818: 11,12  
D7S820: 10  
THO1: 9,9.3  
TPOX: 8  
vWA: 17

### Related Links ▶

NCBI Entrez Search

Cell Micrograph

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Material Transfer Agreement

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Related Cell Culture Products

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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

## Cell Biology

ATCC® Number: **HTB-75™** Order this Item Price: **\$329.00**

Designations: **Caov-3**

Depositors: J Fogh

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Homo sapiens* (human)  
epithelial

Morphology:



Source: **Organ:** ovary  
**Disease:** adenocarcinoma

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

Restrictions: The cells are distributed for research purposes only. The Memorial Sloan-Kettering Cancer Center releases the line subject to the following: 1.) The cells or their products must not be distributed to third parties. Commercial interests are the exclusive property of Memorial Sloan-Kettering Cancer Center. 2.) Any proposed commercial use of these cells must first be negotiated with The Director, Office of Industrial Affairs, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021; phone (212) 639-6181; FAX (212) 717-3439.

Isolation: **Isolation date:** 1976

Amelogenin: X  
CSF1PO: 10,13  
D13S317: 12  
D16S539: 9  
DNA Profile (STR): D5S818: 12  
D7S820: 10  
THO1: 7  
TPOX: 8,10  
vWA: 16,18

**Related Links ▶**

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**BioProducts**

Cell, microbial and molecular genomics products for the life sciences

**BioServices**

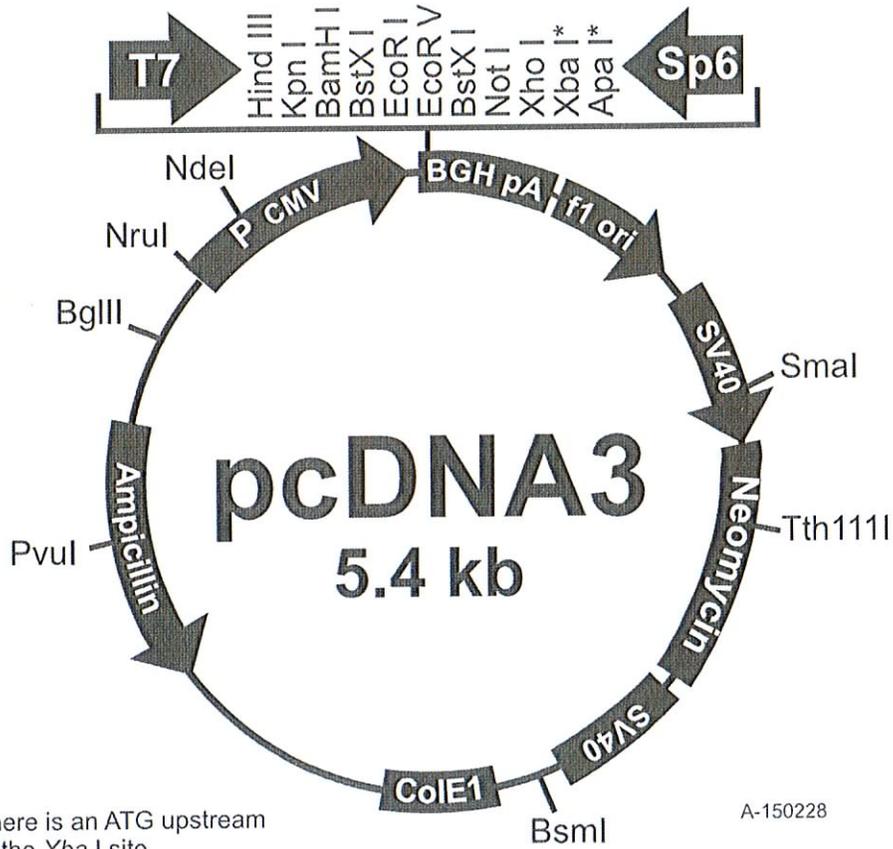
Bio-materials management; basic repository to complex partnership-level services

Comments for pcDNA3:  
5446 nucleotides



CMV promoter: bases 209-863  
T7 promoter: bases 864-882  
Polylinker: bases 889-994  
Sp6 promoter: bases 999-1016  
BGH poly A: bases 1018-1249  
SV40 promoter: bases 1790-2115  
SV40 origin of replication: bases 1984-2069  
Neomycin ORF: bases 2151-2945  
SV40 poly A: bases 3000-3372  
ColE1 origin: bases 3632-4305  
Ampicillin ORF: bases 4450-5310

# Section 4



\* There is an ATG upstream of the Xba I site.

A-150228

The sequence of pcDNA3 has been compiled from information in sequence databases, published sequences, and other sources. This vector has not yet been completely sequenced. If you suspect an error in the sequence, please contact Invitrogen's Technical Services Department.



**STEP 2 :** The resulting plasmid is linearized with Pme I and co-transformed into E. coli strain BJ5183 together with pAdEasy-1, the viral DNA plasmid. Recombinants are selected with kanamycin and screened by restriction enzyme analysis.

**STEP 3 :** The recombinant adenoviral construct is then cleaved with Pac I to expose its ITR (Inverted Terminal Repeats) and transfected into QBI-293A cells to produce viral particles.

### AdEasy™ Kit

The AdEasy™ kit comes in a complete package format containing all the principal components and controls for the construction of 5 recombinant viruses. Each AdEasy™ system kit includes all the components listed below plus your choice of one transfer vector.

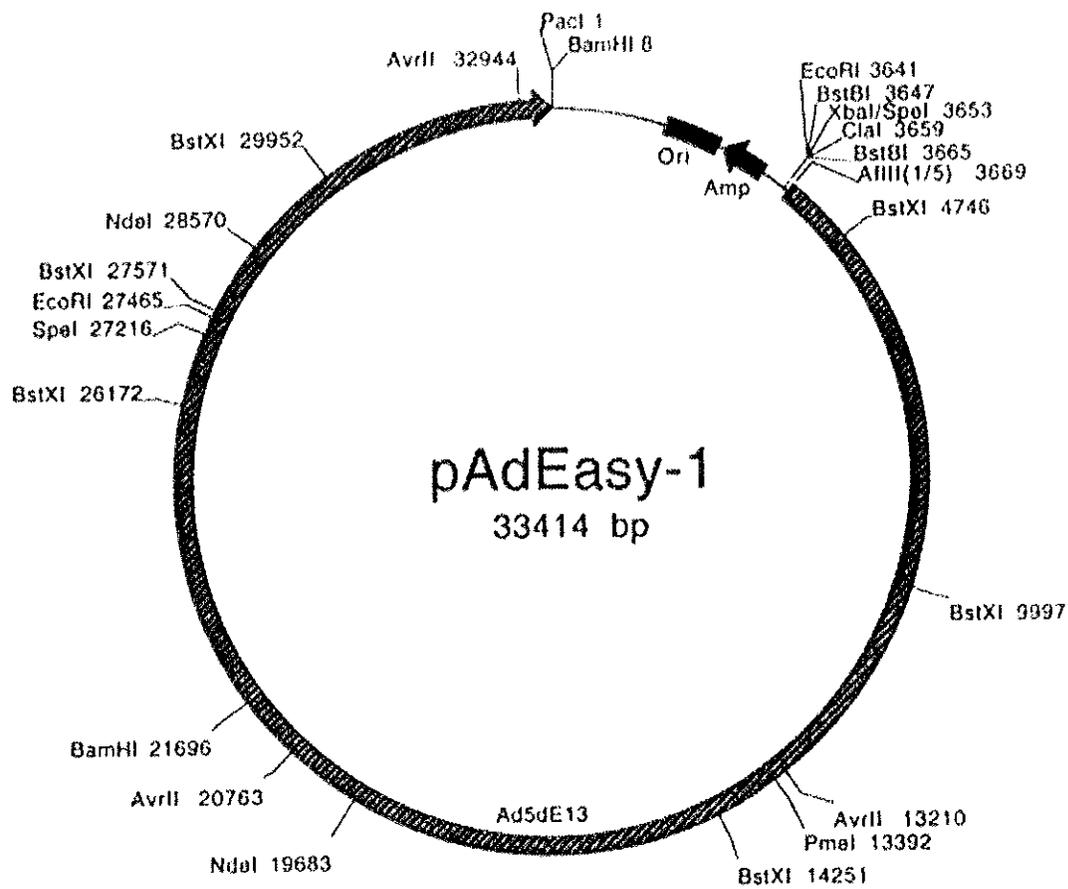
Cat No.	Product	Transfer Vector	Quantity
AES1000	AdEasy™ basic kit	without transfer vector	5 assays
AES1000A	AdEasy™ kit	pShuttle (AES1020)	5 assays
AES1000B	AdEasy™ kit	pShuttle-CMV (AES1021)	5 assays

### [Description of Plasmids and Kit Reagents](#)

### Contents of the AdEasy™ Kit

Cat No.	Product	Description	Quantity	Storage
AES1010	pAdEasy-1 ccc DNA plasmid	Ad5ΔE1/ΔE3	0.5μg (100ng/μl; 5μl)	-20°C
AES1005	BJ5183 EC Electrocompetent cells	BJ5183	5 x 80μl	-80°C
AES1007K	DH5α EC Electrocompetent cells	DH5α	5 x 40μl	-80°C
AES0503	QBI-293A cells	Frozen 293 cell line	1ml (1 X 10 <sup>6</sup> cells/ml)	-150°C
	QBI-Infect Ad5.CMV-LacZΔE1/ΔE3	Viral particles of (in complete DMEM)	1ml (>1000 PFU/ml)	-80°C
	CaCl <sub>2</sub> 2M	Transfection reagent	0.5ml	-20°C
	TE 0.1x	Transfection reagent	0.5ml	-20°C
	HBS 2x	Transfection reagent	3 x 1ml	-20°C
	(see above)	Choice of transfer vector	25μg (500ng/ml; 50μl)	-20°C

Storage  
-20°C to -150°C



E-mail

**Subject:** BARF form attached (Shepherd)  
**From:** Jennifer Stanley <jstanle2@uwo.ca>  
**Date:** Mon, 10 Jan 2011 11:48:41 -0500  
**To:** Trevor Shepherd <tshephe6@uwo.ca>  
**CC:** Gail Ryder <Gail.Ryder@LawsonResearch.Com>

Hello there

Thank you for sending this. Please send the following information:

1. Teresa's training is incomplete. Please let me know what you are doing to rectify this. For information on Biosafety training, please see: [http://www.uwo.ca/humanresources/facultystaff/h\\_and\\_s/training/training\\_idx.htm](http://www.uwo.ca/humanresources/facultystaff/h_and_s/training/training_idx.htm)
2. In Section 5 you say yes to human gene therapy trials...is this the case (as the rest of the section is blank) or did you pick "Yes" by mistake?
3. Thank you for providing information on the HEK cells. Please send any information you have on the other cell lines. We were able to find information on SK-0V3, OVCAR3, and CaOV-3.
4. Please provide information on the pSCA plasmid referenced in Table 4.1.

Thanks  
Jennifer

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

**Subject:**Fwd: Fwd: BARF form attached  
**Date:**Thu, 30 Dec 2010 14:24:38 -0500  
**From:**Jennifer Stanley <jstanle2@uwo.ca>  
**To:**Gail Ryder <Gail.Ryder@LawsonResearch.Com>  
**CC:**Trevor Shepherd <tshephe6@uwo.ca>

Hi Gail  
Please send through the signed version by January 7, 2011...  
All the best,  
Jennifer

Shepherd BARF.pdf	<b>Content-Type:</b> application/pdf <b>Content-Encoding:</b> base64
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