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

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

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

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

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

PRINCIPAL INVESTIGATOR	Mansour Haeryfar
SIGNATURE	M. Haeryfar
DEPARTMENT	Microbiology and Immunology
ADDRESS	Room 234 SDRI
PHONE NUMBER	519 850 2488 (ex. 82488)
EMERGENCY PHONE NUMBER(S)	519 453 6845
EMAIL	mansour.haeryfar @shculich.uwo.ca

Location of experimental work to be carried out: Building(s) __SDRI, ACVS (Health Sciences and West Valley_Room(s)_SDRI 233, SDRI 234, HS6028 and West Valley Barrier)_____

*For work being performed at Institutions affiliated with the University of Western Ontario, the Safety Officer for the Institution where experiments will take place must sign the form prior to its being sent to the University of Western Ontario Biosafety Officer (See Section 12.0, Approvals).

FUNDING AGENCY/AGENCIES:___1. CIHR 2. NSERC 3. MOTP_____(Summaries 1,2 and 3 respectively)_
GRANT TITLE(S): 1.Regulation of antiviral cytotoxic T lymphocyte responses by innate invariant natural killer T cells 2.Deciphering a novel function for TdT in enforcing immunodominance hierarchies of CD8+T lymphocytes. 3.NKT Cells in Organ Transplantation: Glycolipid Immunotherapy as a Novel Approach to Graft Function.

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

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

Delfina Mazzuca Siroen	Saman Maleki Vareki
Mateusz Rytelewski	Marianne van den Heuval
Jacqueline Hayworth	Jin Hayatsu
Nitan Garg	

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

1.0 Microorganisms

1.1 Does your work involve the use of biological agents? X YES
(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? X YES
If YES, please give the name of the species. __

1. Refer to Attachment CFIA (1) (Permit A-2006-01834-4 Amended) July 28th, 2006 Pages 1-6);
2. Refer to Attachment CFIA (2)(Permit A-2008-03115-4 Original, Application # 2008-08494-4, Compliance # C-2008-0633-4, Permit # A-2008-03167-4) October 21st, 2008 pages 1-10;
3. Refer to Attachment CFIA (3)(Permit A-2008-03115-4 Original, Application # 2008-08494-4) October 21st, 2010 pages 1-7

What is the origin of the microorganism(s)? __1 mL imported from NIH initially See CFIA permits (new stocks in house)__
Please describe the risk (if any) of escape and how this will be mitigated: ___if not handled under proper aseptic techniques (use of PPE) exposure of mucosal surfaces could result in influenza symptoms; almost always: cough, fever. Common: fatigue, muscle aches, sore throat, headache, decreased appetite, runny nose. Sometimes: nausea, vomiting and diarrhea. Most people recover within a week to ten days.

Please attach the CFIA permit. See Attachment CFIA 1, 2 and 3
Please describe any CFIA permit conditions: See Attachment CFIA 1,2 and 3

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
Influenza A viruses	X Yes	X Yes	X Yes, transmission from animal to human has been demonstrated on only very rare occasions (See Attachment MSDS 1)	1 Litre during propagation in eggs.	In lab stock See Attachment CFIA-1.	O 1 X 2 O 3
Wildtype vaccinia virus	X Yes	X Yes	X Yes	1 Litre	In lab stock See Attachment CFIA-1	O 1 X 2 O 3
Recombinant vaccinia viruses	X Yes Recombinant vaccinia viruses have greatly reduced pathogenicity due to inactive thymidine kinase	OX Yes	X Yes	1 Litre	In lab stock See Attachment CFIA-1	O 1 X 2 O 3

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Ecoli (DH5α, BL21 (DE3))	X No	X No	X No	1Litre	Invitrogen,	X 1 O 2 O 3

*Please attach a Material Safety Data Sheet or equivalent from the supplier.
1. Influenza A viruses; see attachment MSDS-1 which is currently not available on PHAC website.
2. Wildtype Vaccinica Virus; see attachment MSDS-2
3. Ecoli : See attachment MSDS-3

2.0 Cell Culture

2.1 Does your work involve the use of cell cultures? X YES O NO
If no, please proceed to Section 3.0

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

Cell Type	Is this cell type used in your work?	Source of Primary Cell Culture Tissue	Protocol Number
Human	X Yes O No	Blood (PBMC)	Ethics# 15439E
Rodent	X Yes O No	Spleen, liver, thymic, lymph node tissue, intestinal lymph nodes and peritoneal exudate cells.	AUS Protocol number 2006-065
Non-human primate	O Yes X No		
Other (specify)	O Yes X No		

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Supplier / Source
Human	X Yes O No	See attachment Cell lines 1 and Cell lines 2	See Attachment Cell lines 1
Rodent	X Yes O No	See attachment Cell lines1 and Cell lines 3	See Attachment Cell lines 1
Non-human primate	X Yes O No	See attachment Cells lines 1 and Cell lines 4	See Attachment Cell lines 1
Other (specify)	O Yes X No		

*Please attach a Material Safety Data Sheet or equivalent from the supplier.
*Where ATCC is the supplier the equivalent information to a MSDS has been attached. See attachment Cell lines 1, 2, 3 and 4. Also see PHAC permits.

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

3.0 Use of Human Source Materials

3.1 Does your work involve the use of human source materials? X YES
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**	**Name of Infectious Agent (If**	**PHAC or CFIA Containment Level (Select**

		Agent? YES/NO	applicable)	one)
Human Blood (whole) or other Body Fluid	Healthy and Paroxysmal Nocturnal Hemoglobinuria (PNH) Volunteers	O Yes O No X Unknown		O 1 X 2 O 3
Human Blood (fraction) or other Body Fluid	Healthy and PNH Volunteers	O Yes O No X Unknown		O 1 X 2 O 3
Human Organs or Tissues (unpreserved)		O Yes X No O Unknown		O 1 O 2 O 3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

4.0 Genetically Modified Organisms and Cell lines

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

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

Bacteria Used for Cloning *	Plasmid(s) *	Source of Plasmid	Gene Transfected	Describe the change that results
E Coli	*pBluescript,* *pMAXGFP,* *peGFP-N1* *pRC/CMV* *PBABE-hygro h-Tert* *PBABE-puro SV40 LT*	*Strategene,* *Lonza (AMAXA)* *Clontech* *Invitrogen* *Adgene* *Adgene*	*SV40 large T antigen* *-TERT*	*-expression of T-antigen* *-immortalization of cells*

* Please attach a Material Data Sheet or equivalent if available. See Spec Sheets 1

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

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

* Please attach a Material Safety Data Sheet or equivalent.

4.4 Will genetic sequences from the following be involved?

- HIV O YES, please specify _____ X NO
- HTLV 1 or 2 or genes from any Level 1 or Level 2 pathogens O YES, specify _____ X NO
- SV 40 Large T antigen X YES (will not be using the infectious virus inducing large T antigen expression. We will be working with protein) O NO
- E1A oncogene O YES X NO
- Known oncogenes O YES, please specify _____ X NO
- Other human or animal pathogen and or their toxins O YES, X NO please specify _____

4.5 Will virus be replication defective? X YES O NO

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

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

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5.0 Human Gene Therapy Trials

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

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

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

5.3 How will the biological agent be administered? _____

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

5.5 Has human ethics approval been obtained? O YES, number: _____ O NO O PENDING

6.0 Animal Experiments

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

6.2 Name of animal species to be used_____Mouse_____

6.3 AUS protocol # _____2006-065_____

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

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

7.0 Use of Animal species with Zoonotic Hazards

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

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

8.0 Biological Toxins

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

8.2 If YES, please name the toxin(s)_superantigens (staphylococcal enterotoxins and streptococcal pyrogenic exotoxins)
Please attach information, such as a Material Safety Data Sheet, for the toxin(s) used. See MSDS

8.3 What is the LD_{50} (specify species) of the toxin ---Human-not known, Mice-most are very resistant, specific strains ~100ug/kg, Rabbits ~500ug/kg

8.4 How much of the toxin is handled at one time*? _____0.5mg_____

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

8.5 How much of the toxin is stored*? _____2mg each_____

8.6 Will any biological toxins be used in live animals? X YES, Please provide details:___10-25ug Micrograms quantities will be used to induce immune cell activation in mice. These quantities will highly unlikely be able to induce morbidity and mortality in animals.____ O NO

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

9.0 Insects Requiring CFIA Permits

9.1 Do you use insects that require a permit from the CFIA? O YES x NO
If no, please proceed to Section 10.0

9.2 If YES, please give the name of the species. _____

9.3 What is the origin of the insect? _____

9.4 What is the life stage of the insect? _____

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

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

9.7 Please attach the CFIA permit.

9.8 Please describe any CFIA permit conditions:_____

10.0 Plants Requiring CFIA Permits

10.1 Do you use plants that require a permit from the CFIA? O YES x NO
If no, please proceed to Section 11.0

10.2 If YES, please give the name of the species. _____

10.3 What is the origin of the plant? _____

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

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

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

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

10.8 Is the CFIA permit attached? O YES O NO

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

If NO, please forward the permit to he Biosafety Officer when available.

10.9 Please describe any CFIA permit conditions:

_____

_____

_____

11.0 Import Requirements

11.1 Will any of the above agents be imported? No, We have already imported from USA
If no, please proceed to Section 12.0. I have completed the section below to provide the permit information

11.2 Has an Import Permit been obtained from HC for human pathogens? X YES (for past imports)
See attachments PHAC 1 (permit P-12602,P-12613,P-12675)

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

1. Refer to Attachment CFIA (1) (Permit A-2006-01834-4 Amended) July 28th, 2006 Pages 1-6);
2. Refer to Attachment CFIA (2)(Permit A-2008-03115-4 Original, Application # 2008-08494-4, Compliance # C-2008-0633-4, Permit # A-2008-03167-4) October 21st, 2008 pages 1-10;
3. Refer to Attachment CFIA (3)(Permit A-2008-03115-4 Original, Application # 2008-08494-4) October 21st, 2010 pages 1-7

11.4 Has the import permit been sent to OHS? X YES, please provide permit #

2. Refer to Attachment CFIA (1) (Permit A-2006-01834-4 Amended) July 28th, 2006 Pages 1-6);
2. Refer to Attachment CFIA (2)(Permit A-2008-03115-4 Original, Application # 2008-08494-4, Compliance # C-2008-0633-4, Permit # A-2008-03167-4) October 21st, 2008 pages 1-10;
3. Refer to Attachment CFIA (3)(Permit A-2008-03115-4 Original, Application # 2008-08494-4) October 21st, 2010 pages 1-7

12.0 Training Requirements for Personnel Named on Form

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

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

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

SIGNATURE  _____

13.0 Containment Levels

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

13.2 Has the facility been certified by OHS for this level of containment?
x YES, permit # if on-campus_ BIO-UWO-0150

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O NO, please certify
O NOT REQUIRED for Level 1 containment

14.0 Procedures to be Followed

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

SIGNATURE M-Heeney Date: April 7, 2010

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

___No additional risks beyond containment level 2 – Vaccinia policy to be followed -> see attached ?

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

1. Educate persons working with needles and/or animals that all needlesick injuries and animal bites are potentially serious and require immediate First Aid.
2. The needlestick and/or bite wound should be washed immediately in warm soapy water.
3. If the wound is bleeding, attempt to encourage bleeding by expressing the wounded area.
4. After washing, cover the wound with a dry sterile dressing
5. Go to Workplace Health, Room 25, University Community Centre (UCC) for further assessment and treatment. After hours go to University Hospital Emergency Department. Write up a incident report for Workplace Health Review
6. Educate self and staff to prevent future incident.

15.0 Approvals

UWO Biohazard Subcommittee: SIGNATURE: _____
Date: _____

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

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

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

Special Conditions of Approval:

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

Western

Workplace Health

Policy for Researchers Using Vaccinia Virus

Workplace Health does not provide Vaccinia immunization or post-immunization follow up for researchers working with vaccinia virus.

Persons who have received vaccinia immunization should not come to Workplace Health or the UWO Family Practice Clinic at any time during the period of post-immunization viral shedding. This is based upon the potential risk to patients (particularly infants and children) in the Clinic waiting area.

Presently, (as of fall 2007) Dr. David Colby has agreed to undertake the immunization and follow up of researchers working with vaccinia.

Persons immunized for vaccinia must be cautioned regarding viral shedding following immunization and the potential risk to others from post-immunization viral shedding.

Approved Biohazards Committee December 6, 2007

June 2, 2010 info

Subject: Re: Biohazardous Agents Registry Form: Haeryfar lab
From: Delfina Siroen <dmazzuca@uwo.ca>
Date: Wed, 02 Jun 2010 16:18:59 -0400
To: Jennifer Stanley <jstanle2@uwo.ca>
CC: Mansour Haeryfar <Mansour.Haeryfar@schulich.uwo.ca>

Hello Jennifer,

Question 8.4- we will not have stored more then 0.25mg of each toxin.

Currently Ectromelia is not in use.

Cheers,
Delfina

On Wed, Jun 2, 2010 at 4:15 PM, Jennifer Stanley <jstanle2@uwo.ca> wrote:

> Hello there -
>
> Your form was discussed at the May meeting, with some outstanding questions:
>
> 1. Question 8.4 - is it 0.5 mg of each toxin or 0.25 mg of each toxin (ie 0.5 mg total)
>
> 2. Please confirm that the Ectromelia is only stored at this time (not in use).
>
> Thanks!
> Jennifer

Grant Summary: CIHR- Regulation of Antiviral Cytotoxic T-Lymphocyte Responses by Innate Invariant Natural Killer T-Cells

Cells of the immune system such as CD8+ T lymphocytes play an important role in clearing viral infections. As such, constant efforts are being made to design novel therapeutic strategies to boost CD8+ T cell responses to disease-causing viral invaders.
Natural killer T (NKT) cells are a tiny subset of lymphocytes that are considered attractive candidate targets for immunotherapy of a wide range of illnesses, including infectious diseases. This is owed to their ability to modulate various aspects of immunity. Using genetically altered animals and various NKT cell-stimulating agents, we propose to examine the influence of these cells on the overall magnitude and quality of virus-specific CD8+ T cell responses against medically important, but radically different viral pathogens, influenza A virus (IAV), vaccinia virus (VV) and ectromelia virus (ECTV). We will also explore the importance of NKT cells in resolving infection with these viruses.
Immunity to IAV is an issue of grave concern due to the economic burden of seasonal flu on the Canadian healthcare system as well as the possibility of a global influenza outbreak, which requires urgent attention and world-wide preparedness. VV constitutes the vaccine for the causative agent of smallpox, which can be potentially used as a bioweapon. Moreover, genetically manipulated VVs are among the most commonly used vectors in therapeutic vaccination against infectious diseases and cancer. ECTV is a natural mouse pathogen that causes mousepox, and has been used as a disease model of choice for human smallpox. Therefore, our studies hold promise of inventing novel and efficient NKT cell-based therapeutic modalities to enhance host defense against IAV, poxviruses and potentially other viral pathogens.

Grant Summary NSERC- Deciphering a novel function for TdT in enforcing immunodominance hierarchies of CD8+ T lymphocytes.

We will investigate the role of a protein called terminal deoxynucleotidyl transferase (TdT) in generation of antiviral CD8+ T cell responses. CD8+ T cells comprise an important line of defense against disease-causing viruses. They recognize viral antigens (i.e., molecules considered by the immune system as foreign) and convert to cytotoxic T lymphocytes (CTLs) capable of eliminating virus-infected cells. It is well known that mammalian T cell repertoire consists of a huge number of CTL precursors, each bearing a "pre-made" antigen receptor of unique specificity. The diversity of T cell repertoire results from the function of several key molecules including TdT during T cell development in the thymus. Although viral propagation inside host cells generates thousands of virus-derived peptides and despite the fact that adult T cell pools contain CTL precursors specific for many (if not all) of these peptides, only a limited number of CTL clones rise to the task of detecting viral antigens and combating viral invaders. The magnitude of responses among these few clones varies to a great extent, leading to the establishment of a conserved hierarchy among them. This phenomenon is called immunodominance. Many consider immunodominance an obstacle to successful immune responses targeting as many antigenic sites as possible. It is therefore important to understand how immunodominance hierarchies are shaped. While several factors vis-à-vis peptide generation within host cells have been shown to contribute to immunodominance, only little is known about the relationship between early T cell development in the thymus and dominance hierarchies of CTLs induced in response to viruses encountered later in life. Our preliminary data point to a role for TdT as a missing link between the two phases. We will use modern cellular and molecular techniques and multiple model systems to reveal the importance of TdT in dictating dominance hierarchies of virus-specific T cells. The findings of this study are expected to advance our understanding of CD8+ T cell biology and immunodominance and to introduce a novel biological function for TdT beyond its well-established role during T cell development.

Grant Summary MOTP-NKT cells in organ transplantation: gylcolipid immunotherapy as a novel approach to graft function.

Transplantation is considered the last resort in treating patients with end-stage organ failure. Organ transplantation offers hope for extended and improved quality of life. However, the success of this procedure is often hampered by immunological transplant rejection. Immunosuppressive agents have been used for many years to silence harmful anti-donor immune responses to prevent graft rejection. Unfortunately, these agents are highly toxic and their long-term usage makes the recipients susceptible to opportunistic infections and increased risk of cancer. Moreover, grafted organ dysfunction remains one of the most common causes of transplant loss that most current immunosuppressive drugs fail to prevent. These problems together with the ever-increasing shortage of organ donors justifies the urgent need for invention of novel immunotherapeutic strategies aiming at enhancing transplanted organ survival while sparing immune responses against pathogenic microorganisms. Such strategies, if successful, not only hold promise of saving many lives, but also helps relieve the financial burden associated with organ transplantation such as the need for long-term therapy with high doses of immunosuppressive drugs.

Recent years have witnessed increasing experimental and clinical interest in natural killer T (NKT) cells, a small population of lymphocytes with extremely potent immunomodulatory properties. NKT cells are responsive to lipid molecules and produce large amounts of cytokines (small proteins released by various cells that mediate cell-to-cell communications in the immune system), some of which may exert beneficial effects in attenuating anti-donor immune responses. This is supported by our previous observations in two animal models of allotransplantation (grafting between individuals of the same species). We propose to explore the therapeutic potential of an NKT cell-activating lipid called α-C-galactosylceramide in delaying/preventing graft rejection in rodent models of allotransplantation and xenotransplantation (grafting between individuals from different species).

Our expected findings in mouse models will be highly clinically relevant and hold promise of introducing novel immunotherapeutic strategies in transplant recipients. This is in large part due to the fact that responsiveness to lipids is evolutionarily conserved among mice and humans to the extent that several clinical trials of certain NKT cell-activating lipids have been conducted or are underway in cancer patients. Furthermore, it is known that differences among human subjects in terms of the type of cytokines they produce play an important role in graft rejection, and pre-transplant cytokine profiles of transplant recipient candidates may be useful in predicting the outcome of transplantation. Therefore, pre-screening for various cytokine profiles may prove to be of prognostic value and help tailor novel lipid-based immunotherapy to the patients' pre-transplant cytokine profiles.

Attachment CFIA(1.)

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

Office of Biohazard Containment and Safety
Science Advice and Biohazards Division
Science Strategies Directorate, CFIA
159 Cleopatra Drive, Ottawa, Ontario K1A 0Y9
Tel: (613) 221-7088 Fax: (613) 228-6129
Email: hallidaya@inspection.gc.ca

Bureau du confinement des biorisques et sécurité
Division des avis scientifiques et contrôle des biorisques
Direction des stratégies scientifiques, ACIA
159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7088 Téléc: (613) 228-6129
Courriel: hallidaya@inspection.gc.ca

Facsimile Transmittal Notice / Transmission par télécopieur

To:		*From:*	
Mansour Haeryfar University of Western Ontario		Andrew Halliday Animal Pathogen Import Program / Programme d'importation d'agents zoopathogènes	
Facsimile/télécopieur	519-661-3499	*Facsimile/télécopieur*	613-228-6129

Subject/Sujet: **Importation of animal pathogens / d'agents zoopathogènes**

Message:

Please find attached a copy of the import permit/letter for which you applied. Please review condition #13 and any additional condition(s) on your permit.

PLEASE DESTROY PREVIOUS PERMIT

Please visit our website at: http://www.inspection.gc.ca/english/sci/bio/bioe.shtml.

New: *Frequently Asked Questions* (FAQ) section has been added to our website!

Andrew Halliday

Signature	*Date:*	*Telephone No.*	*No. of Pages*
C.dM H	*July 31, 2006*	613-221-7088	6

Canadian Food Inspection Agency
Goverment of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2006-01834-4
AMENDED
2006/07/28
year/mo/day
année/mois/jour

IMPORT PERMIT PERMIS D'IMPORTATION

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	Exporter/Exportateur
UNIVERSITY OF WESTERN ONTARIO MICROBIOLOGY & IMMUNOLOGY, DENTAL SCIENCES BLDG. LONDON, ONTARIO N6A5C1 Contact: Mansour Haeryfar Applicant Name: MANSOUR HAERYFAR Phone: (519)-850-2488 Fax: (519)-661-3499	LABORATORY OF VIRAL DISEASES, NATIONAL INSTITUTES OF HEALTH ROOM 201, BUILDING 4, 9000 ROCKVILLE PIKE BETHESDA MARYLAND UNITED STATES 20892-0440 Contact: Dr. Jack Bennink or Dr. Bernard Moss Phone: (301) 402-4603 Fax: (301) 480-1147
Quarantine/Destination/Quarantaine	**Producer/Producteur**

Valid/Valide	**from/du**	2006/07/07 year/month/day année/mois/jour	**to/au**	2007/07/31 year/month/day année/mois/jour	**Country of Origin/ Pays d'Origine** UNITED STATES

For the entry of/ Pour l'entrée de: _____ Single shipment/Chargement simple XX Multiple shipments/Chargements multiples

Place of entry into Canada/Lieu d'entrée au Canada:
Toronto

FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE:
(Description of things(s)/Description de la ou des choses)
1. Product Description: SEE ATTACHMENT TO ANIMAL PATHOGEN IMPORT PERMIT A-2006-01834-4.

(TO BE USED IN VITRO AND IN VIVO IN ROOMS 5002, 5003, AND THE ANIMAL CARE FACILITY, DENTAL SCIENCES BUILDING, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.) Proposed End Use: "In Vitro" Scientific Name: Biocontainment Level: 2

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

Selected Conditions / Conditions Choisies

SEE ATTACHMENT TO ANIMAL PATHOGEN IMPORT PERMIT A-2006-01834-4.

(TO BE USED IN VITRO AND IN VIVO IN ROOMS 5002, 5003, AND THE ANIMAL CARE FACILITY, DENTAL SCIENCES BUILDING, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.)

1. 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.

2. 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.

3. 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.

Canada

Canadian Food Inspection Agency
Goverment of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2006-01834-4
AMENDED
2006/07/28
year/mo/day
année/mois/jour

IMPORT PERMIT PERMIS D'IMPORTATION

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	Exporter/Exportateur
UNIVERSITY OF WESTERN ONTARIO MICROBIOLOGY & IMMUNOLOGY, DENTAL SCIENCES BLDG. LONDON, ONTARIO N6A5C1 Contact: Mansour Haeryfar Applicant Name: MANSOUR HAERYFAR Phone: (519)-850-2488 Fax: (519)-661-3499	LABORATORY OF VIRAL DISEASES, NATIONAL INSTITUTES OF HEALTH ROOM 201, BUILDING 4, 9000 ROCKVILLE PIKE BETHESDA MARYLAND UNITED STATES 20892-0440 Contact: Dr. Jack Bennink or Dr. Bernard Moss Phone: (301) 402-4603 Fax: (301) 480-1147

Selected Conditions / Conditions Choisies (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 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.

6. 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.

7. 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.

8. 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.

9. Consideration of an application necessary for issuance of a permit to import the described animal or thing is subject to Class 1 fees.

10. 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.

11. 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.

12. The material authorized for importation by this permit is to be used in in vitro studies or in vivo studies in laboratory animals maintained in containment facilities. Within containment, the imported material must not be introduced into domestic or wild animals (including birds or fish) unless written authorization is obtained from the Canadian Food Inspection Agency.

Canada

Canadian Food Inspection Agency
Goverment of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2006-01834-4
AMENDED
2006/07/28
year/mo/day
année/mois/jour

IMPORT PERMIT PERMIS D'IMPORTATION

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	Exporter/Exportateur
UNIVERSITY OF WESTERN ONTARIO MICROBIOLOGY & IMMUNOLOGY, DENTAL SCIENCES BLDG. LONDON, ONTARIO N6A5C1 Contact: Mansour Haeryfar Applicant Name: MANSOUR HAERYFAR Phone: (519)-850-2488 Fax: (519)-661-3499	LABORATORY OF VIRAL DISEASES, NATIONAL INSTITUTES OF HEALTH ROOM 201, BUILDING 4, 9000 ROCKVILLE PIKE BETHESDA MARYLAND UNITED STATES 20892-0440 Contact: Dr. Jack Bennink or Dr. Bernard Moss Phone: (301) 402-4603 Fax: (301) 480-1147

Selected Conditions / Conditions Choisies (Continued/Suite)

13. This permit is conditional upon a permit being obtained under the Human Pathogens Importation Regulations to import the pathogenic material and upon that import permit being produced and valid when the above pathogenic material is presented to an inspector for inspection at the time of importation.

Cinthia Labrie

Authorized By:/Approuvé par:
CINTHIA LABRIE

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

Canada

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

Biohazard Containment and Safety Unit
Science Advice and Biohazards Division
Science Strategies Directorate, CFIA
159 Cleopatra Drive, Ottawa, Ontario K1A 0Y9
Tel: (613) 221-7070 Fax: (613) 228-6129
Email: labriec@inspection.gc.ca

Unité du confinement des biorisques et sécurité
Division des avis scientifiques et contrôle des biorisques
Direction des stratégies scientifiques, ACIA
159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7070 Téléc: (613) 228-6129
Courriel: labriec@inspection.gc.ca

ATTACHMENT TO ANIMAL PATHOGEN(S) IMPORTATION PERMIT
ATTACHEMENT AU PERMIS D'IMPORTATION D'AGENTS ZOOPATHOGÈNES
#A-2006-01834-4 (Amended July 28, 2006)

Issued to/ Délivré à: **Mansour Haeryfar, Department of Microbiology and Immunology, Dental Sciences Building, University of Western Ontario, London ON N6A 5C1**

Includes the following animal pathogen containment Level 2 microorganisms:
Inclut les agents zoopathogènes de niveau de confinement 2 suivant:

Cell Lines:

- C57SV (SV40-transformed murine fibroblastic cell line)
- kxd SV (mouse SV40-transformed cell line)
- KD2SV (SV40-transformed murine kidney epithelial cell line)
- SS SV(SV40 transformant)
- 1E12 (Mouse TAP 1-mutant T lymphoma cell line which may contain SV40)

Influenza A Virus Strains:

- A/Puerto Rico/8/34 (PR8)
- PB1-F2 (deficient PR8)
- PR8.SEQ12
- A/Hong Kong/68 (H3N2)
- J-1 (reassortant of A/Hong Kong/68)
- X31 (reassortant of A/Hong Kong/68)
- A/NT/60/68 (NT60 strain) (H3N2)
- E61-13-H17 (reassortant of X31 and NT60)

Vaccinia Virus Strains:

- rVV-vSC8
- rVV-OVA
- rVV-ES SIINFEKL [rVV ES OVA (257-264)]
- rVV-MSIINFEKL
- rVV-mouse CD1.1
- rVV-mCD1.1ΔY322→A
- rVV-mCD1.1Δcyto (del. 319-326)
- rVV-human CD23 (FcERII)
- rVV-mouse CD54 (ICAM-1)
- rVV-LLO (M91-99:GYKDGNEYI)
- rVV-Listeria p60 (M449-457: IYVGNGQMI)
- rVV-CD80 (B7-1)
- rVV-CD86 (B7-2)
- rVV-CD80 + CD86 (B71 & 2)
- rVV- EGFP
- rVV-mouse invariant chain (Ii)
- rVV-ES P815 P1A (35-43)
- rVV-Listeria p60 (M217-225: KYGVSVQDI)
- rVV-ES NP (366-374): ASNENMETM; PR8)
- rVV-ES PA (224-233: SSLENFRAYV; PR8)
- rVV-PA (M224-253; PR8)
- rVV-ES PB1 (703-711: SSYRRPVGI; PR8)
- rVV-PB1 (703-711: SSYRRPVGI; PR8)
- rVV-ES NP (147-155: TYQRTRALV; PR8)
- rVV-NP (M147-155)
- rVV-ES HA (M518-526 or MIYSTVASSL; PR8)
- rVV-HA (M518-526 or MIYSTVASSL; PR8)
- rVV-ES PB1 F2 (LSLRNPILV)

ATTACHMENT TO ANIMAL PATHOGEN(S) IMPORTATION PERMIT
ATTACHEMENT AU PERMIS D'IMPORTATION D'AGENTS ZOOPATHOGÈNES
#A-2006-01834-4 (Amended July 28, 2006)

Issued to/ Délivré à: **Mansour Haeryfar, Department of Microbiology and Immunology, Dental Sciences Building, University of Western Ontario, London ON N6A 5C1**

Includes the following animal pathogen containment Level 2 microorganisms:
Inclut les agents zoopathogènes de niveau de confinement 2 suivant:

Vaccinia Virus Strains - *continued from page 1:*

- rVV-PB1 F2 (MLSLRNPILV)
- rVV-SV40 T Ag
- rVV-ES SV40 Tag (206-215: SAINNYAQKL)
- rVV-ES SV40 Tag (223-231: CKGVNKEYL)
- rVV-ES SV40 Tag (404-411: VVYDFLKC)
- rVV-ES SV40 Tag (489-497: QGINNLDNL)
- rVV-SV40 Tag (M206-215)
- rVV-PR8 NP (βgal+) SIINFEKL + EGFP
- rVV-CMV pp65
- rVV-NP (M367-374: MSNENMETM: PR8)
- rVV-SV40 Tag (404-411: MVVYDFLKC)
- rVV-SV40 Tag (M223-231)
- rVV-human TAP (1 and 2)
- rVV-ubiquitin
- rVV-PR8 NP (βgal+)
- rVV-HEL (Hen Egg Lysozyme)
- rVV-ES P815 P1A (35-43)
- rVV-P815p (MHIYEFPQL)
- rVV-ES P815p (HIYEFPQL)
- rVV-ES P815 (KYQAVTTTL)
- rVV-P815 (MKYQAVTTTL)
- rVV-human tumor-associated Ag HER-2/neu (M654-662: MKIFGSLAFL)
- rVV-human tumor-associated Ag HER-2/neu (654-662: MKIFGSLAFL)
- rVV-HLA-B27
- rVV-mouse IFNγ
- rVV-mouse p53
- rVV-fox p3
- rVV-mouse TLR9
- rVV-mouse TNF-α

NOTE: THIS IMPORT PERMIT IS VALID ONLY FOR *IN VITRO* and *IN VIVO* USAGE OF THE IMPORTED MICRO-ORGANISM(S).

Cinthia Labrie

July 28, 2006
Date

Cinthia Labrie
A/Chief, Animal Pathogen Importation Program/
Chef intérimaire, Programme d'importation des agents zoopathogènes

Canada

Attachment
CFIA (2)

Canadian Food Inspection Agency / Agence canadienne d'inspection des aliments

Office of Biohazard Containment and Safety
National Laboratory Operations
Science Branch, CFIA
159 Cleopatra 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
Opérations nationale des laboratoires
Direction générale des sciences, ACIA
159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7068 Téléc: (613) 228-6129
Courriel: ImportZoopath@Inspection.gc.ca

FACSIMILE TRANSMITTAL NOTICE / TRANSMISSION PAR TÉLÉCOPIEUR

To / À:		*From / De:*	
Dr. Mansour Haeryfar U of Western Ontario		John Andrades Animal Pathogen Import Program / Programme d'importation des agents zoopathogènes	
Facsimile/télécopieur:	519-661-3499	*Facsimile/télécopieur:*	613-228-6129

Subject/Objet: **CFIA Importation Documentation**

Message:

Please find attached / Veuillez trouver ci-joint :

☑ A copy of a Compliance letter for your containment level 2 facility/Une copie d'une lettre de Conformité pour votre laboratoire de niveau de confinement 2.

☑ A copy of a Non-pathogenic letter for the product(s) you requested./ Une copie de la lettre de non-pathogénicité pour le(s) produit(s) demandé(s).

☑ A copy of the import permit for which you applied. Please review the conditions appearing on your permit. / Une copie de votre permis d'importation. Veuillez s'il-vous-plaît prendre note des conditions apparaissant sur votre permis.

☑ Condition # 13: The product(s) requested is(are) also regulated by the Public Health Agency of Canada (PHAC). Please contact PHAC at (613) 957-1779. / Le(s) produit(s) demandé(s) sont également réglementés par l'Agence de santé publique du Canada (ASPC). Veuillez contacter l'ASPC au (613) 957-1779.

John Andrades
andradesj@inspection.gc.ca

Signature:	*Date:*	*Telephone/Téléphone:*	*No./Nbre Pages:*
	October 23, 2008	613-221-7068	10

Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

Office of Biohazard Containment and Safety
National Laboratory Operations
Science Branch, CFIA
159 Cleopatra Drive, Ottawa, Ontario K1A 0Y9
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159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7068 Téléc: (613) 228-6129
Courriel: ImportZoopath@inspection.gc.ca

Animal Pathogen Import Permit
Material Safety Data Sheet Requirement

Please find attached your CFIA Import Permit. You indicated on the *Facility Certification* form that you do not have a Material Safety Data Sheet for one or all of the organisms listed on this import permit.

The *Containment Standards for Veterinary Facilities* (p.45, http://www.inspection.gc.ca/english/sci/lab/convet/convete.shtml) stipulate that :

- personnel must receive training on the potential hazards associated with the work involved and the necessary precautions to prevent exposures to zoonotic agents and release of non-indigenous agents; personnel must show evidence that they understood the training provided; training must be documented and signed by both the employee and supervisor.

The Office of Biohazard Containment and Safety (BCS) considers the availability of Material Safety Data Sheets to be one component of training and an important tool for providing information about potential biohazards. Therefore in cases where a Material Safety Data Sheet is not publicly available, we are requesting that the importer prepare their own MSDS using available scientific information on safety procedures that take into account virulence, transmission, and decontamination.

Would you please find or prepare a Material Safety Data Sheet for the above pathogen. It would be appreciated if you would send us a copy for our own records.

For your reference, our website includes a list of Pathogen Safety Data Sheets (PSDS) for certain animal pathogens. They can be found at the following website: http://www.inspection.gc.ca/english/sci/bio/anima/disemala/disemalae.shtml. Also, Public Health Agency of Canada's Office of Laboratory Security produces Material Safety Data Sheets (MSDS) for infectious microorganisms. The MSDS's can be located at the following website: http://www.phac-aspc.gc.ca/msds-ftss/index.html

Sincerely,

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

Canada

Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2008-03115-4
ORIGINAL
2008/10/21
year/mo/day
année/mois/jour

IMPORT PERMIT PERMIS D'IMPORTATION

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	**Exporter/Exportateur**
UNIVERSITY OF WESTERN ONTARIO 1151 RICHMOND STREET LONDON, ONTARIO N6A5C1 Contact: DR. MANSOUR HAERYFAR Applicant Name: DR. MANSOUR HAERYFAR Phone: (519) 850-2488 Fax: (519) 661-3499 Email: MANSOUR.HAERYFAR@SCHULICH.UWO.CA	VARIOUS SUPPLIERS WITHIN UNITED STATES
Quarantine/Destination/Quarantaine	**Producer/Producteur**
Valid/Valide from/du 2008/10/21 year/month/day année/mois/jour **to/au** 2009/10/31 year/month/day année/mois/jour	**Country of Origin/** Pays d'Origine UNITED STATES

For the entry of/ Pour l'entrée de: Single shipment/Chargement simple XX Multiple shipments/Chargements multiples

Place of entry into Canada/Lieu d'entrée au Canada:
Toronto

FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE:
(Description of things(s)/Description de la ou des choses)
1. Product Description:
-AUTOGRAPHA CALIFORNICA NUCLEAR POLYHEDROSIS VIRUS (BACULOVIRUS) EXPRESSING THE SV40 LARGE T ANTIGEN;
-RMA-S MOUSE CELL LINE INDUCED BY RAUSCHER'S MURINE LEUKEMIA VIRUS.

(TO BE USED IN VITRO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.) Proposed End Use: "In Vitro" Scientific Name: Biocontainment Level: 2

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

Selected Conditions / Conditions Choisies

-AUTOGRAPHA CALIFORNICA NUCLEAR POLYHEDROSIS VIRUS (BACULOVIRUS) EXPRESSING THE SV40 LARGE T ANTIGEN;
-RMA-S MOUSE CELL LINE INDUCED BY RAUSCHER'S MURINE LEUKEMIA VIRUS.

(TO BE USED IN VITRO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.)

1. 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

Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2008-03115-4
ORIGINAL
2008/10/21
year/mo/day
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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	Exporter/Exportateur
UNIVERSITY OF WESTERN ONTARIO 1151 RICHMOND STREET LONDON, ONTARIO N6A5C1 Contact: DR. MANSOUR HAERYFAR Applicant Name: DR. MANSOUR HAERYFAR Phone: (519) 850-2488 Fax: (519) 661-3499 Email: MANSOUR.HAERYFAR@SCHULICH.UWO.CA	VARIOUS SUPPLIERS WITHIN UNITED STATES

Selected Conditions / Conditions Choisies (Continued/Suite)

thing(s) must be provided for inspection at the first port of entry or to a Canadian Food Inspection Agency Import Service Center.

2. 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.

3. 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.

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 wil 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 ir 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

Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
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IMPORT PERMIT PERMIS D'IMPORTATION

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

Importer/Importateur	Exporter/Exportateur
UNIVERSITY OF WESTERN ONTARIO 1151 RICHMOND STREET LONDON, ONTARIO N6A5C1 Contact: DR. MANSOUR HAERYFAR Applicant Name: DR. MANSOUR HAERYFAR Phone: (519) 850-2488 Fax: (519) 661-3499 Email: MANSOUR.HAERYFAR@SCHULICH.UWO.CA	VARIOUS SUPPLIERS WITHIN UNITED STATES

Selected Conditions / Conditions Choisies (Continued/Suite)

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.

13. Importations of any microorganisms that are also pathogenic to humans must, in addition, be accompanied by an appropriate, valid, import permit from Public Health Agency of Canada (PHAC).

Cinthia Labrie

Authorized By:/Approuvé par:
CINTHIA LABRIE

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

Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

Office of Biohazard Containment and Safety
National Laboratory Operations
Science Branch, CFIA
159 Cleopatra 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
Opérations nationale des laboratoires
Direction générale des sciences, ACIA
159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7068 Téléc: (613) 228-6129
Courriel: ImportZoopath@inspection.gc.ca

October 21, 2008

Application #: 2008-08494-4

Dr. S.M. Mansour Haeryfar
University of Western Ontario
Department of Microbiology and Immunology
1151 Richmond Street
London, Ontario N6A 5C1

By Facsimile: (519) 661-3499

SUBJECT: **Importation of cell lines from the United States**

Dear Dr. Haeryfar:

Our office received your request for a permit to import the following products from various suppliers in the United States:

Hybridomas and cell lines of Human and Mouse origin with the following designations:

- N37-2C12
- N37-1A12
- N38-3C3
- H28-E23
- NA2-8C4
- X63 AG8
- PK136
- GK1.5
- 2.43
- C1R Human Lymphoblastoid cell line transfected with Human CD1d

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.

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

Sincerely,

Cinthia Labrie

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

Canada

Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments

Office of Biohazard Containment and Safety
National Laboratory Operations
Science Branch, CFIA
159 Cleopatra 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
Opérations nationale des laboratoires
Direction générale des sciences, ACIA
159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7068 Téléc: (613) 228-6129
Courriel: ImportZoopath@inspection.gc.ca

October 21, 2008 Compliance #: C-2008-0633-4

Dr. S.M. Mansour Haeryfar / Ms. Jennifer Stanley
University of Western Ontario - Department of Microbiology and Immunology
1151 Richmond Street
London, Ontario N6A 5C1

By Facsimile: (519) 661-3499

SUBJECT: **Laboratory Compliance to *Containment Standards for Veterinary Facilities***

Dear Dr. Haeryfar and Ms. Stanley:

The Office of Biohazard Containment and Safety (OBCS) has received and reviewed your Inspection Checklist, of October 20, 2008. **The OBCS confirms that the following location is compliant** with the *Containment Standards for Veterinary Facilities* as a **containment level 2 laboratory - for work in vitro ONLY:**

> **Dental Sciences Building (DSB) 5002, 5003, and Animal Care Facility**
> University of Western Ontario - Department of Microbiology and Immunology
> 1151 Richmond Street, London, Ontario N6A 5C1

Compliance of this laboratory will be effective for 2 years, until October 20, 2010; after which an updated Inspection Checklist will be required for all future requests.

For your reference, the *Containment Standards for Veterinary Facilities*, from which the inspection checklist was adapted, are available on the internet at the following website: http://www.inspection.gc.ca/english/sci/lab/convet/convete.shtml

Note: Canadian distributors of biological products (animal pathogens) regulated under the *Health of Animals Act* will require their clients to submit a copy of this letter.

Please do not hesitate to contact the Office of Biohazard Containment and Safety of the CFIA if you have any questions.

Sincerely,

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

Canada

Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2008-03167-4
ORIGINAL
2008/10/22
year/mo/day
année/mois/jour

IMPORT PERMIT PERMIS D'IMPORTATION

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	**Exporter/Exportateur**
UNIVERSITY OF WESTERN ONTARIO 1151 RICHMOND STREET LONDON, ONTARIO N6A5C1 Contact: DR. MANSOUR HAERYFAR Applicant Name: DR. MANSOUR HAERYFAR Phone: (519) 850-2488 Fax: (519) 661-3499 Email: MANSOUR.HAERYFAR@SCHULICH.UWO.CA	VARIOUS SUPPLIERS WITHIN UNITED STATES
Quarantine/Destination/Quarantaine	**Producer/Producteur**
Valid/Valide from/du 2008/10/22 year/month/day année/mois/jour **to/au** 2009/10/31 year/month/day année/mois/jour	**Country of Origin/ Pays d'Origine** UNITED STATES

For the entry of/ Pour l'entrée de: Single shipment/Chargement simple XX Multiple shipments/Chargements multiples

Place of entry into Canada/Lieu d'entrée au Canada:
Toronto

FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE:
(Description of things(s)/Description de la ou des choses)
1. Product Description: C57SV MOUSE FIBROBLAST CELL LINE TRANSFORMED WITH SV40.

(TO BE USED IN VITRO AND IN VIVO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003 AND IN THE ANIMAL CARE FACILITY, SCHULICH SCHOOL OF MEDICINE, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.) Proposed End Use: "In Vitro" and "In Vivo" Scientific Name: Biocontainment Level: 2

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

Selected Conditions / Conditions Choisies

C57SV MOUSE FIBROBLAST CELL LINE TRANSFORMED WITH SV40.

(TO BE USED IN VITRO AND IN VIVO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003 AND IN THE ANIMAL CARE FACILITY, SCHULICH SCHOOL OF MEDICINE, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.)

1. 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.

2. 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.

Canadian Food Inspection Agency
Government of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

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Selected Conditions / Conditions Choisies (Continued/Suite)

3. 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.

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 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.

6. 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.

7. 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.

8. 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.

9. Consideration of an application necessary for issuance of a permit to import the described animal or thing is subject to Class 1 fees.

10. 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.

11. 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
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Selected Conditions / Conditions Choisies (Continued/Suite)

12. The material authorized for importation by this permit is to be used in in vitro studies or in vivo studies in laboratory animals maintained in containment facilities. Within containment, the imported material must not be introduced into domestic or wild animals (including birds or fish) unless written authorization is obtained from the Canadian Food Inspection Agency.

13. Importations of any microorganisms that are also pathogenic to humans must, in addition, be accompanied by an appropriate, valid, import permit from Public Health Agency of Canada (PHAC).

Cinthia Labrie

Authorized By:/Approuvé par:
CINTHIA 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.

CFIA (3)

Canadian Food Inspection Agency
Goverment of Canada

Agence canadienne d'inspection des aliments
Gouvernement du Canada

Permit No./N° de permis:
A-2008-03115-4
ORIGINAL
2008/10/21
year/mo/day
année/mois/jour

IMPORT PERMIT PERMIS D'IMPORTATION

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Quarantine/Destination/Quarantaine	**Producer/Producteur**
Valid/Valide from/du 2008/10/21 year/month/day année/mois/jour **to/au** 2009/10/31 year/month/day année/mois/jour	**Country of Origin/ Pays d'Origine** UNITED STATES

For the entry of/ Pour l'entrée de: Single shipment/Chargement simple XX Multiple shipments/Chargements multiples

Place of entry into Canada/Lieu d'entrée au Canada:
Toronto

FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE:
(Description of things(s)/Description de la ou des choses)
1. Product Description: -AUTOGRAPHA CALIFORNICA NUCLEAR POLYHEDROSIS VIRUS (BACULOVIRUS) EXPRESSING THE SV40 LARGE T ANTIGEN;
-RMA-S MOUSE CELL LINE INDUCED BY RAUSCHER'S MURINE LEUKEMIA VIRUS TRANSFECTED WITH HUMAN CD1D.
(TO BE USED IN VITRO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.) Proposed End Use: "In Vitro" Scientific Name: Biocontainment Level: 2

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

Selected Conditions / Conditions Choisies

-AUTOGRAPHA CALIFORNICA NUCLEAR POLYHEDROSIS VIRUS (BACULOVIRUS) EXPRESSING THE SV40 LARGE T ANTIGEN;
-RMA-S MOUSE CELL LINE INDUCED BY RAUSCHER'S MURINE LEUKEMIA VIRUS TRANSFECTED WITH HUMAN CD1D.

(TO BE USED IN VITRO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.)

1. 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

Canada

Canadian Food Inspection Agency
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Selected Conditions / Conditions Choisies (Continued/Suite)

thing(s) must be provided for inspection at the first port of entry or to a Canadian Food Inspection Agency Import Service Center.

2. 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.

3. 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.

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 wil 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

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Selected Conditions / Conditions Choisies (Continued/Suite)

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.

13. Importations of any microorganisms that are also pathogenic to humans must, in addition, be accompanied by an appropriate, valid, import permit from Public Health Agency of Canada (PHAC).

Cinthia Labrie

Authorized By:/Approuvé par:
CINTHIA 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 collected as required under the provisions of the Access to Information Act.

Canada

Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

Office of Biohazard Containment and Safety
National Laboratory Operations
Science Branch, CFIA
159 Cleopatra 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
Opérations nationale des laboratoires
Direction générale des sciences, ACIA
159 promenade Cleopatra, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7068 Téléc: (613) 228-6129
Courriel: ImportZoopath@inspection.gc.ca

October 21, 2008

Application #: 2008-08494-4

Dr. S.M. Mansour Haeryfar
University of Western Ontario
Department of Microbiology and Immunology
1151 Richmond Street
London, Ontario N6A 5C1

By Facsimile: (519) 661-3499

SUBJECT: **Importation of cell lines from the United States**

Dear Dr. Haeryfar:

Our office received your request for a permit to import the following products from various suppliers in the United States:

Hybridomas and cell lines of Human and Mouse origin with the following designations:

- PAb-101
- N37-2C12
- N37-1A12
- N38-3C3
- H28-E23
- NA2-8C4
- X63 AG8
- PK136
- GK1.5
- 2.43
- C1R Human Lymphoblastoid cell line transfected with Human CD1d

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.

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

Sincerely,

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

Canada

Canadian Food Inspection Agency
Goverment of Canada

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UNIVERSITY OF WESTERN ONTARIO 1151 RICHMOND STREET LONDON, ONTARIO N6A5C1 Contact: DR. MANSOUR HAERYFAR Applicant Name: DR. MANSOUR HAERYFAR Phone: (519) 850-2488 Fax: (519) 661-3499 Email: MANSOUR.HAERYFAR@SCHULICH.UWO.CA	VARIOUS SUPPLIERS WITHIN UNITED STATES
Quarantine/Destination/Quarantaine	**Producer/Producteur**
Valid/Valide from/du 2008/10/22 year/month/day année/mois/jour **to/au** 2009/10/31 year/month/day année/mois/jour	**Country of Origin/ Pays d'Origine** UNITED STATES

For the entry of/ Pour l'entrée de: Single shipment/Chargement simple XX Multiple shipments/Chargements multiples

Place of entry into Canada/Lieu d'entrée au Canada:
Toronto

FOR THE IMPORTATION OF:/POUR L'IMPORTATION DE:
(Description of things(s)/Description de la ou des choses)
1. Product Description: C57SV MOUSE FIBROBLAST CELL LINE TRANSFORMED WITH SV40 & TRANSFECTED WITH MOUSE CD1D.

(TO BE USED IN VITRO AND IN VIVO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003 AND IN THE ANIMAL CARE FACILITY, SCHULICH SCHOOL OF MEDICINE, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.) Proposed End Use: "In Vitro" and "In Vivo" Scientific Name: Biocontainment Level: 2

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

Selected Conditions / Conditions Choisies

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(TO BE USED IN VITRO AND IN VIVO ONLY IN THE DENTAL SCIENCES BUILDING (DSB) ROOMS 5002 AND 5003 AND IN THE ANIMAL CARE FACILITY, SCHULICH SCHOOL OF MEDICINE, UNIVERSITY OF WESTERN ONTARIO, LONDON, ON.)

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Selected Conditions / Conditions Choisies (Continued/Suite)

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6. 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.

7. 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.

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Selected Conditions / Conditions Choisies (Continued/Suite)

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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.

MSDS -1

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: Influenza virus

SYNONYM OR CROSS REFERENCE: Flu; orthomyxovirus; influenza virus types A, B, and C

CHARACTERISTICS: *Orthomyxoviridae*; single-stranded negative sense RNA virus, segmented, mostly spherical 80-120 nm diameter, enveloped, highly pleiomorphic; strains of influenza A are described by geographic origin, strain number, year of isolation and hemagglutinin (H) and neuraminidase (N) antigens

SECTION II - HEALTH HAZARD

PATHOGENICITY: An acute viral disease of the upper respiratory tract characterized by acute fever, chills, headache, myalgia, weakness, runny nose and mild sore throat and cough, cough can be severe; nausea and vomiting are uncommon; fatality is generally low, except in those with chronic lung or heart conditions; recovery in 2-14 days

EPIDEMIOLOGY: Influenza can occur in pandemics and epidemics, localized outbreaks, and as sporadic cases; type A includes 3 subtypes (H1N1, H2N2, H3N2) associated with widespread epidemics and pandemics, epidemics of influenza A have appeared in North America at intervals of roughly 1-3 years, influenza B every 3-4 yrs; mixed epidemics also occur; type C has been associated with sporadic cases and minor localized outbreaks, but has never been associated with epidemic outbreaks; disease more severe in older persons, children and persons with cardiac or pulmonary conditions or immune compromised individuals,

HOST RANGE: Influenza A virus - humans; swine, horses; domestic and wild avian species, influenza B virus - humans only

INFECTIOUS DOSE: Influenza A 2-790 p.f. units (nasopharyngeal route)

MODE OF TRANSMISSION: By direct contact through droplet infection, aerosols; airborne spread among crowded populations in enclosed spaces; virus may persist for hours in dried mucus and be transmitted by direct contact (occasionally fomites)

INCUBATION PERIOD: Short, usually 1-4 days

COMMUNICABILITY: Highly communicable; probably limited to 3-5 days from clinical onset, up to 7 days in young children

SECTION III - DISSEMINATION

RESERVOIR: Humans; animal reservoirs (particularly swine) are suspected as sources of new human subtypes

ZOONOSIS: Yes, transmission from animal to man has been demonstrated on only very rare occasions; influenza virus transmission have been reported to occur between swine, humans and wild and domestic fowl

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Type A is usually susceptible (other types are resistant) to amantadine HC1 and rimantadine HCL (given with in first 48 hrs of the disease in adults), no affect on influenza type B; trial studies on two new drugs

(Relenza and Tamiflu - neuramidase inhibitors) appear to be extremely effective

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

PHYSICAL INACTIVATION: Susceptible to heat (56° C for at least 30 min) and radiation

SURVIVAL OUTSIDE HOST: Dried mucus - several hours, virus particles are relatively labile

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms of flu

FIRST AID/TREATMENT: Fluids and rest; amantadine or rimantadine HC1 useful in prevention and attenuation of influenza A infections; antibiotic treatment to prevent secondary bacterial pneumonia

IMMUNIZATION: Active immunization for serotypes A and B directed primarily at persons with greatest risk of serious complication or death (certain health care personnel); 70-80 % effective when sufficient mass of antigen closely matches the prevailing wild strain of virus; vaccine should be given each year before influenza season

PROPHYLAXIS: In epidemic situation, amantadine or rimantadine HCl useful for influenza A, not influenza type B; new inhibitors of influenza neuraminidase (oseltamivir) particularly effective against influenza A and B

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: Not normally documented in literature, but are known to occur by informal accounts and published reports, particularly when new strains showing antigenic drift or shift are introduced into the laboratory; 15 reported cases up to 1974; animal-associated infections are not reported, however, risk is high from infected ferrets

SOURCES/SPECIMENS: Respiratory tissues or secretions of humans or most infected animals; cloaca of many infected avian species; virus may be disseminated in multiple organs in some infected animal species

PRIMARY HAZARDS: Inhalation of virus from aerosols generated when aspirating, dispensing, or mixing virus-infected samples; from infected animals, especially ferrets

SPECIAL HAZARDS: Genetic manipulation of virus has unknown potential for altering host range, pathogenicity or for introducing into man transmissible viruses with novel antigenic composition

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices and containment when receiving and inoculating routine diagnostic specimens; biosafety considerations should take into account infectiousness of strains used and potential for harm to individual or society in event of a laboratory-acquired infection and subsequent transmission; biosafety level 2 for research utilizing contemporary strains, with older noncontemporary human strains, with recombinants, or with animal isolates

PROTECTIVE CLOTHING: Laboratory coat; gloves when contact is unavoidable; work in biosafety cabinet with gloves and gown

OTHER PRECAUTIONS: Autopsy material should be handled in a biological safety cabinet using biosafety level 2 procedures

SECTION VIII - HANDLING INFORMATION

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

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

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: May, 2000

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.

[Material Safety Data Sheets - Index]

Vaccinia virus - Material Safety Data Sheets (MSDS)

[Material Safety Data Sheets - Index]

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: ***Vaccinia virus***

SYNONYM OR CROSS REFERENCE: Poxvirus, smallpox vaccine

CHARACTERISTICS: *Poxviridae*; 230 x 400 nm, complex coat and capsid, dsDNA

SECTION II - HEALTH HAZARD

PATHOGENICITY: Virus disease of skin induced by inoculation for the prevention of smallpox - vesicular or pustular lesion, area of induration or erythema surrounding a scab or ulcer at inoculation site; major complications encephalitis, progressive vaccinia (immunocompromised susceptible), eczema vaccinatum - a localized or systemic dissemination of vaccinia virus, fetal vaccinia; minor complications - generalized vaccinia with multiple lesions; auto-inoculation of mucous membranes or abraded skin, benign rash, secondary infections; complications are serious for those with eczema or who are immunocompromised; death is most often the result of postvaccinial encephalitis or progressive vaccinia

EPIDEMIOLOGY: Routine vaccination is no longer carried out as smallpox has now been eradicated; only used in armed forces and laboratories

HOST RANGE: Humans

INFECTIOUS DOSE: Vaccines have potency of 10^8 pock-forming units/mL; infectious dose unknown

MODE OF TRANSMISSION: Virus may be transmitted to contacts of individuals who have been vaccinated recently

INCUBATION PERIOD: 1 week after vaccination (lesion at point of inoculation); generalized vaccinia 5-10 days

COMMUNICABILITY: Communicable to unvaccinated contacts

SECTION III - DISSEMINATION

RESERVOIR: Humans; held in restricted stocks

ZOONOSIS: None

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: N/A

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, formaldehyde

PHYSICAL INACTIVATION: Heat-labile antigen destroyed at 60° C, heat-stable antigen withstands 100° C (both may be present in infected tissue)

SURVIVAL OUTSIDE HOST: Lyophilized vaccinia virus maintains potency for 18 months at 4-6° C, may be stable when dried onto inanimate surfaces

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirmation by identification of vaccinia pocks, isolation of virus, serology

FIRST AID/TREATMENT: Vaccinia immune globulin and methisazone may be of value in treating complications

IMMUNIZATION: Smallpox vaccine is indicated for laboratory workers directly involved with vaccinia and vaccinia virus recombinants

PROPHYLAXIS: See Treatment

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 18 reported variola laboratory infections and 2 reported infections of laboratory workers with recombinant vaccinia virus

SOURCES/SPECIMENS: Lesion fluids or crusts, respiratory secretions or tissues of infected hosts

PRIMARY HAZARDS: Ingestion, parenteral inoculation, droplet or aerosol exposure of mucous membranes or broken skin with infectious fluids or tissues

SPECIAL HAZARDS: Some poxviruses are stable when dried

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for all activities involving the manipulation of this virus (with vaccination); primary containment devices and biological safety cabinets are recommended

PROTECTIVE CLOTHING: Laboratory coat; gloves and gown when working with agent

OTHER PRECAUTIONS: Immunization of staff working directly with vaccinia

SECTION VIII - HANDLING INFORMATION

SPILLS: 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 centre; allow sufficient contact time before clean up (30 min)

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

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: May, 2001

Prepared by: Office of Laboratory Security, PHAC

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

Date Modified: 2001-09-25

MSDS-3

invitrogen

Material Safety Data Sheet

Revision Date: 24-Mar-2008

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

Product code 500149
Product name BL21 (DE3) One Shot

Company/Undertaking Identification

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

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

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

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous/Non-hazardous Components

Chemical Name	CAS-No	Weight %
Glycerol	56-81-5	10-30

3. HAZARDS IDENTIFICATION

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

Form
Liquid

3. HAZARDS IDENTIFICATION

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

HMIS

Health	0
Flammability	0
Reactivity	0

4. FIRST AID MEASURES

Skin contact	Wash off immediately with plenty of water
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes
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

Chemical Name	OSHA PEL (TWA)	OSHA PEL (Ceiling)	ACGIH OEL (TWA)	ACGIH OEL (STEL)
Glycerol	15 mg/m³ total dust 5 mg/m³ respirable fraction	-	10 mg/m³	-

Engineering measures Ensure adequate ventilation, especially in confined areas

Personal protective equipment

Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment
Hand protection	Protective gloves
Eye protection	Safety glasses with side-shields
Skin and body protection	Lightweight protective clothing.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice
Environmental exposure controls	Prevent product from entering drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Form Liquid

Important Health Safety and Environmental Information

Boiling point/range	°C No data available	°F No data available
Melting point/range	°C No data available	°F No data available
Flash point	°C No data available	°F No data available
Autoignition temperature	°C No data available	°F No data available
Oxidizing properties	No information available	
Water solubility	No data available	

10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Materials to avoid	No information available
Hazardous decomposition products	No information available
Polymerization	Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Chemical Name	LD50 (oral,rat/mouse)	LD50 (dermal,rat/rabbit)	LC50 (inhalation,rat/mouse)
Glycerol	12600 mg/kg (Rat)	10 g/kg (Rabbit)	570 mg/m³ (Rat)

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	No information available.
Bioaccumulation	No information available

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

IATA

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

15. REGULATORY INFORMATION

International Inventories

Chemical Name	TSCA	PICCS	ENCS	DSL	NDSL	AICS
Glycerol	Listed	Listed	Listed	Listed	-	Listed

U.S. Federal Regulations

SARA 313
This product is not regulated by SARA.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contains HAPs.

U.S. State Regulations

Chemical Name	Massachusetts - RTK	New Jersey - RTK	Pennsylvania - RTK	Illinois - RTK	Rhode Island - RTK
Glycerol	Listed	-	Listed	-	Listed

California Proposition 65
This product does not contain chemicals listed under Proposition 65

WHMIS hazard class:
Non-controlled

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

16. OTHER INFORMATION

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

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

End of Safety Data Sheet

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

Product code 500512
Product name DH5alpha-E™ Cell

Company/Undertaking Identification

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

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

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

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Hazardous/Non-hazardous Components

Chemical Name	CAS-No	Weight %
Glycerol	56-81-5	7-13

3. HAZARDS IDENTIFICATION

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

Form
Liquid

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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

HMIS

Health	0
Flammability	0
Reactivity	0

4. FIRST AID MEASURES

Skin contact	Wash off immediately with plenty of water
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes
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

Chemical Name	OSHA PEL (TWA)	OSHA PEL (Ceiling)	ACGIH OEL (TWA)	ACGIH OEL (STEL)
Glycerol	15 mg/m³ total dust 5 mg/m³ respirable fraction	-	10 mg/m³	-

Engineering measures	Ensure adequate ventilation, especially in confined areas

Personal protective equipment

Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment
Hand protection	Protective gloves
Eye protection	Safety glasses with side-shields
Skin and body protection	Lightweight protective clothing.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice
Environmental exposure controls	Prevent product from entering drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Form	Liquid

Important Health Safety and Environmental Information

Boiling point/range	°C No data available	°F No data available
Melting point/range	°C No data available	°F No data available
Flash point	°C No data available	°F No data available
Autoignition temperature	°C No data available	°F No data available
Oxidizing properties	No information available	
Water solubility	No data available	

10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Materials to avoid	No information available
Hazardous decomposition products	No information available
Polymerization	Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Chemical Name	LD50 (oral,rat/mouse)	LD50 (dermal,rat/rabbit)	LC50 (inhalation,rat/mouse)
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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	No information available.
Bioaccumulation	No information available

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

IATA

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

15. REGULATORY INFORMATION

International Inventories

Chemical Name	TSCA	PICCS	ENCS	DSL	NDSL	AICS
Glycerol	Listed	Listed	Listed	Listed	-	Listed

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SARA 313
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This product does not contains HAPs.

U.S. State Regulations

Chemical Name	Massachusetts - RTK	New Jersey - RTK	Pennsylvania - RTK	Illinois - RTK	Rhode Island - RTK
Glycerol	Listed	-	Listed	-	Listed

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End of Safety Data Sheet

MATERIAL SAFETY DATA SHEET

Date Printed: 03/10/2010
Date Updated: 07/21/2009
Version 1.8

Section 1 - Product and Company Information

Product Name	STAPHYLOCOCCAL ENTEROTOXIN B FROM STAPHYLOCOCCUS AUREUS
Product Number	S4881
Brand	SIGMA
Company Address	Sigma-Aldrich Canada, Ltd 2149 Winston Park Drive Oakville ON L6H 6J8 CA
Technical Phone: Fax: Emergency Phone:	9058299500 9058299292 800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ENTEROTOXIN B	11100-45-1	No

Synonyms: Enterotoxin B, staphylococcal * Staphylococcal enterotoxin B
RTECS Number: XW5807700

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Harmful.
Biomedical material. May cause human disease. Target organ(s): Small intestine.

HMIS RATING

HEALTH: 4*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 4
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

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

Section 4 - First Aid Measures

ORAL EXPOSURE

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

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

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

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

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Spilled material should be carefully wiped up or moistened with water and removed. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Avoid inhalation. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure. Do not use if skin is cut or scratched. Wash thoroughly after handling.

STORAGE
Suitable: Keep tightly closed.
Store at 2-8°C

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

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

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse.

Section 9 - Physical/Chemical Properties

Appearance: Physical State: Solid

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Nature of decomposition products not known.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. Harmful if inhaled.
Ingestion: Harmful if swallowed.

SENSITIZATION

Sensitization: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

TARGET ORGAN(S) OR SYSTEM(S)

Small intestine.

SIGNS AND SYMPTOMS OF EXPOSURE

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

CONDITIONS AGGRAVATED BY EXPOSURE

Causes emesis and diarrhea in experimental animals. Associated with food poisoning and causes enteritis in humans. The dose of purified protein required to produce emesis or diarrhea in monkeys is 0.9ug/kg by oral feeding (Biochem. Vol 4, 1965).

TOXICITY DATA

Intravenous
Monkey
25 UG/KG
LDLO

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Toxins, extracted from living sources, solid, n.o.s.
UN#: 3462
Class: 6.1
Packing Group: Packing Group III
Hazard Label: Toxic substances.
PIH: Not PIH

IATA

Proper Shipping Name: Toxins, extracted from living sources, solid, n.o.s.
IATA UN Number: 3462
Hazard Class: 6.1
Packing Group: III

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: Xn
Indication of Danger: Harmful.
R: 20/22
Risk Statements: Harmful by inhalation and if swallowed.
S: 22-24/25-36/37
Safety Statements: Do not breathe dust. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Harmful.
US Statements: Biomedical material. May cause human disease.
Target organ(s): Small intestine.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No

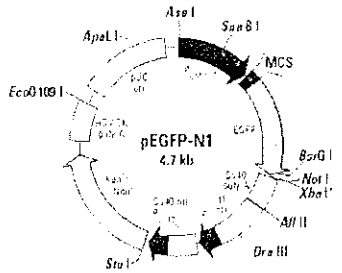
CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: No
NDSL: No

Section 16 - Other Information

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

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

Spec Sheets 1



Restriction Map and Multiple Cloning Site of pEGFP-N1. (Unique restriction sites are in color or bold.) The *Xba* I site follows the EGFP stop codon. The *Xba* I site (*) is methylated in the DNA provided by CLONTECH. If you wish to digest the vector with this enzyme, you will need to transform the vector into a *dam*- host and make fresh DNA.

Note: The vector sequence file has been compiled from information in the sequence database, published literature, and other sources, together with partial sequences obtained by CLONTECH. This vector has not been completely sequenced.

Sequence

Map

Features and Multiple Cloning Site

Description

pEGFP-N1 encodes a red-shifted variant of wild-type GFP (1-3) which has been optimized for brighter fluorescence and higher expression in mammalian cells. (Excitation maximum = 488 nm; emission maximum = 507 nm.) pEGFP-N1 encodes the GFPmut1 variant (4) which contains the double-amino-acid substitution of Phe-64 to Leu and Ser-65 to Thr. The coding sequence of the EGFP gene contains more than 190 silent base changes which correspond to human codon-usage preferences (5). Sequences flanking EGFP have been converted to a Kozak consensus translation initiation site (6) to further increase the translation efficiency in eukaryotic cells. The MCS in pEGFP-N1 is between the immediate early promoter of CMV (P_{CMV-E}) and the EGFP coding sequences. Genes cloned into the MCS will be expressed as fusions to the N-terminus of EGFP if they are in the same reading frame as EGFP and there are no intervening stop codons. SV40 polyadenylation signals downstream of the EGFP gene direct proper processing of the 3' end of the EGFP mRNA. The vector backbone also contains an SV40 origin for replication in mammalian cells expressing the SV40 T-antigen. A neomycin-resistance cassette (neo^r), consisting of the SV40 early promoter, the neomycin/kanamycin resistance gene of Tn5, and polyadenylation signals from the Herpes simplex thymidine kinase gene, allows stably transfected eukaryotic cells to be selected using G418. A bacterial promoter upstream of this cassette (P_{amp}) expresses kanamycin resistance in *E. coli*. The pEGFP-N1 backbone also provides a pUC19 origin of replication for propagation in *E. coli* and an f1 origin for single-stranded DNA production.

Vector	Size	Cat. #	GenBank Accession #
pEGFP-N1	20 µg	6085-1	U55762

Use

Fusions to the N-terminus of EGFP retain the fluorescent properties of the native protein allowing the localization of the fusion protein *in vivo*. The target gene should be cloned into pEGFP-N1 so that it is in frame with the EGFP coding sequences, with no intervening in-frame stop codons. The inserted gene should include the initiating ATG codon. The recombinant EGFP vector can be transfected into mammalian cells using any standard transfection method. If required, stable transformants can be selected using G418 (7). pEGFP-N1 can also be used simply to express EGFP in a cell line of interest (e.g., as a transfection marker).

Location of Features

- Human cytomegalovirus (CMV) immediate early promoter: 1-589
  - Enhancer region: 59-465
  - TATA box: 554-560
  - Transcription start point: 583
  - C->G mutation to remove *Sac* I site: 569
- MCS: 591-671
- Enhanced green fluorescent protein gene
  - Kozak consensus translation initiation site: 672-682
  - Start codon (ATG): 679-681; Stop codon: 1396-1398
  - Insertion of Val at position 2: 682-684
  - GFPmut1 chromophore mutations (Phe-64 to Leu; Ser-65 to Thr): 871-876
  - His-231 to Leu mutation (AAT): 1373
- SV40 early mRNA polyadenylation signal
  - Polyadenylation signals: 1552-1557 & 1581-1586
  - mRNA 3' ends: 1590 & 1602
- f1 single-strand DNA origin: 1649-2104
  (packages the noncoding strand of EGFP)
- Bacterial promoter expression of Kan^r gene:
  - -35 region: 2166-2171; -10 region: 2189-2194
  - Transcription start point: 2201
- SV40 origin of replication: 2445-2580
- SV40 early promoter
  - Enhancer (72-bp tandem repeats): 2278-2349 & 2350-2421
  - 21-bp repeats: 2425-2445, 2446-2466, & 2468-2488
  - Early promoter element: 2501-2507
  - Major transcription start points: 2497, 2535, 2541 & 2546
- Kanamycin/neomycin resistance gene
  - Neomycin phosphotransferase coding sequences:
  - Start codon (ATG): 2629-2631; stop codon: 3421-3423
  - G->A mutation to remove *Pst* I site: 2811
  - C->A (Arg to Ser) mutation to remove *BssH* II site: 3157
- Herpes simplex virus (HSV) thymidine kinase (TK) polyadenylation signal
  Polyadenylation signals: 3659-3664 & 3672-3677
- pUC plasmid replication origin: 4008-4651

Primer Locations

- EGFP-*N* Sequencing Primer (#6479-1): 745-724
- EGFP-C Sequencing Primer (#6478-1): 1332-1353

Propagation in *E. coli*

- Suitable host strains: DH5-alpha, HB101, and other general purpose strains. Single-stranded DNA production requires a host containing an F plasmid such as JM101 or XL1-Blue.
- Selectable marker: plasmid confers resistance to kanamycin (30 µg/ml) to *E. coli* hosts.

pmaxCloning™

Products > Research Products > Transfection > Amaxa® Vectors > Vectors

Cat. No. VDC-1040
Size 20µg
Concentration0.5 µg/µl

Vector description
pmaxCloning™ Vector is an eukaryotic expression plasmid to promote constitutive expression of cloned DNA inserts in mammalian cells. The pmaxCloning™ Vector backbone contains immediate early promoter of cytomegalovirus (PCMV IE)* for protein expression, a chimeric intron for enhanced gene expression and the pUC origin of replication for propagation in *E. coli*. The bacterial Promoter (P) provides kanamycin resistance gene expression in E. coli. The multiple cloning site (MCS) is located between the CMV promoter and the SV40 polyadenylation signal (SV40 poly A). The pmaxCloning™ Vector can be used for both transient and stable expression of genes. For stable expression the pmaxCloning™ Vector must be co-transfected with an expression vector containing a selectable gene for mammalian cells.

Cloning of DNA insert
The pmaxCloning™ Vector does not contain an ATG initiation codon. A translation initiation sequence must be incorporated if the DNA fragment to be cloned does not have an initiating ATG codon or an optimal sequence for initiating translation, such as the Kozak sequence [GCC(A/G)CCATGG].

Expression in mammalian cells
pmaxCloning™ Vector can be transfected into mammalian cells by any known transfection method. The CMV promoter provides strong, constitutive expression of the cloned DNA insert in many cell types.

Propagation in *E. coli*

- Suitable host strains: DH5alpha, HB101, and other general purpose strains.
- Selectable marker: plasmid confers resistance to kanamycin (30 µg/ml) to *E. coli* hosts
- E. coli replication origin: pUC
- Copy number: ~500
- Plasmid incompatibility group: pMB1/ColE1

Location of features:PCMV IE: 1-798
Chimeric intron: 811-947
MCS: 947-1048
SV40 late mRNA polyadenylation signal: 1051-1251
Polyadenylation signal: 1148-1153
pUC plasmid replication origin: 1325-1966
Kanamycin resistance gene: 2028-2819
Bacterial promoter for expression of Kan^r gene: 2820-2852

*The CMV promoter is covered under the U.S. patents 5,168,062 and 5,385,839 and its use is permitted for research purposes only. Any other use of the CMV promoter requires a license from the University of Iowa Research Foundation, 214 Technology Innovation Center, Iowa City, IA, USA.
The use of this product, alone or in combination with materials and/or methods of others, may require a license from a third party. User shall be fully responsible for determining whether and from whom it requires such license and for obtaining such license.

Plasmid 1773: pBABE-hygro-hTERT

Gene/insert name:	hTERT
Alternative names:	telomerase reverse transcriptase
Insert size (bp):	3500
Gene/insert aliases:	TERT, TP2, TRT, EST2, TCS1, hEST2
Species of gene(s):	H. sapiens (human)
Vector backbone:	pBABE-hygro (Search Vector Database)
Type of vector:	Mammalian expression,Retroviral
Backbone size (bp):	5558
Cloning site 5':	EcoRI
Site destroyed during cloning:	No
Cloning site 3':	SalI
Site destroyed during cloning:	No
5' Sequencing primer:	pBABE 5' (List of Sequencing Primers)
Bacteria resistance:	Ampicillin
High or low copy:	High Copy
Grow in standard E. coli @ 37C:	Yes
Selectable markers:	Hygromycin
Sequence:	Visit www.addgene.org/1773
Author's Map:	Visit www.addgene.org/1773
Plasmid Provided In:	DH5a
Principal Investigator:	Bob Weinberg

Article: Dissociation among in vitro telomerase activity, telomere maintenance, and cellular immortalization. Counter CM et al. (Proc Natl Acad Sci U S A 1998 Dec 8;95(25):14723-8. Pubmed)

Please acknowledge the principal investigator and cite this article if you use this plasmid in a publication.

Also, please include the text "Addgene plasmid 1773" in your Materials and Methods section. This information allows Addgene to create a link from the plasmid page to your publication.

Please check www.addgene.org/1773 for updated plasmid information and related links.

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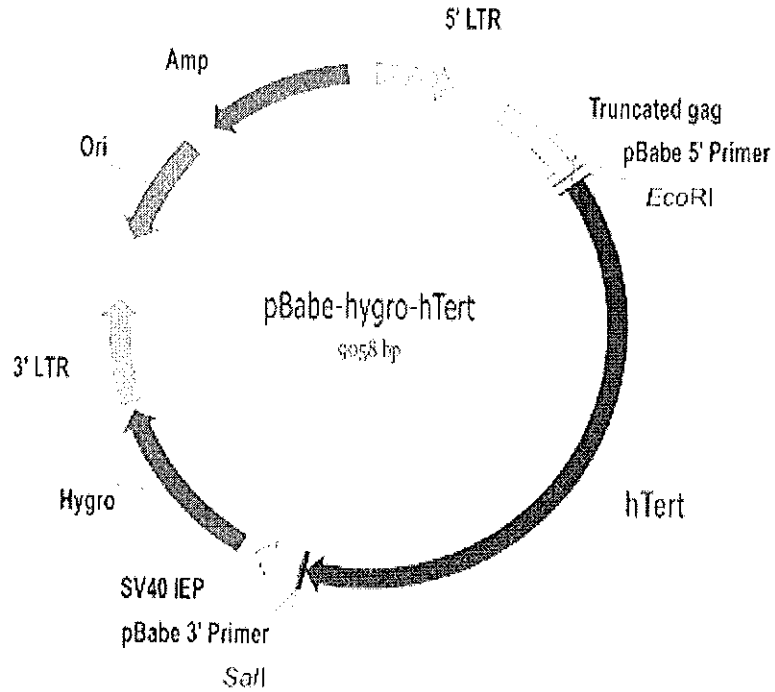
Find this plasmid at: www.addgene.org
Enter "1773" in the search box



Please check www.addgene.org/1773 for updated plasmid information and related links.

addgene

Find this plasmid at: www.addgene.org
Enter "13970" in the search box

Plasmid 13970: pBABE-puro SV40 LT

Gene/insert name:	SV40 LT
Alternative names:	Simian virus-40 large-T antigen
Insert size (bp):	2200
GenBank/Entrez ID of insert:	AF316141
Gene/insert aliases:	SV40gp6
Species of gene(s):	H. sapiens (human) Other
Vector backbone:	pBABE-puro (Search Vector Database)
Type of vector:	Mammalian expression,Retroviral
Backbone size (bp):	5169
Cloning site 5':	BamHI?
Site destroyed during cloning:	No
Cloning site 3':	BamHI?
Site destroyed during cloning:	No
5' Sequencing primer:	pBABE 5' (List of Sequencing Primers)
3' Sequencing primer:	pBABE 3'
Bacteria resistance:	Ampicillin
High or low copy:	Unknown
Grow in standard E. coli @ 37C:	Yes
Selectable markers:	Puromycin
Sequence:	Visit www.addgene.org/13970
Plasmid Provided In:	DH5a
Principal Investigator:	Thomas Roberts

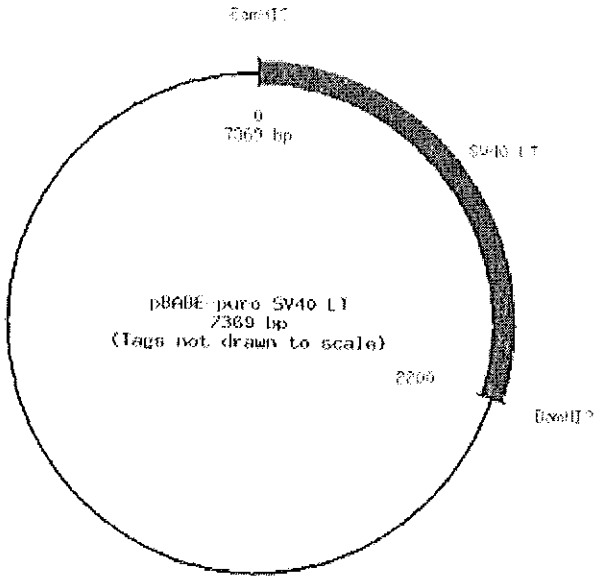
Please acknowledge the principal investigator if you use this plasmid in a publication.

Also, please include the text "Addgene plasmid 13970" in your Materials and Methods section. This information allows Addgene to create a link from the plasmid page to your publication.

Please check www.addgene.org/13970 for updated plasmid information and related links.

addgene

Find this plasmid at: www.addgene.org
Enter "13970" in the search box



Cell line	Organism	Source(s)
145-2C11	*Cricetulus migratorius / Mus musculus*	ATCC CRL-1975™; Dr. David Hoskin (Dalhousie)
2.4 G2	*Rattus norvegicus / Mus musculus*	ATCC HB-197™, MH (NIH)
25D1.16	*Mus musculus*	MH (NIH)
293 A QBI	*Homo sapiens*	
293 A2	*Homo sapiens*	
293 Db	*Homo sapiens*	
293 KB	*Homo sapiens*	MH (NIH)
A20 CD1d_KH	*Mus musculus*	Dr. Steven Porcelli
A20 WT	*Mus musculus*	Dr. Steven Porcelli
A205-2	*Mus musculus*	
BSC-1	*Cercopithecus aethiops*	ATCC CCL-26™; MH (NIH)
C57SV	*Mus musculus*	MH (NIH)
C57SV-CD1	*Mus musculus*	Dr. A. Bendelac, U Chicago
C57SV-CD1d	*Mus musculus*	Dr. A Bendelac; U Chicago
C57SV-mockTransfected	*Mus musculus*	Dr. A Bendelac; U Chicago
CACO-2	*Homo sapiens*	ATCC HTB-37™; MH (NIH)
C1R.d3	*Homo sapiens*	
C1R.CD1d	*Homo sapiens*	Dr. Steven Porcelli
C1R.mock	*Homo sapiens*	Dr. Steven Porcelli
CRL10762™	*Cricetulus griseus*	ATCC CRL10762 (CTLA4 Ig-24); MH (NIH)
DC2.4	*Mus musculus*	NIH; Dr. Ken Rock
DC2.4-KR	*Mus musculus*	Ken Rock
DN32.D3	*Mus musculus*	MH (NIH)
E.G7-OVA	*Mus musculus*	ATCC CRL-2113™
EL4	*Mus musculus*	ATCC TIB-39™
G7	*Rattus norvegicus / Mus musculus*	Dr. D. Hoskin (Dalhousie)
G7 mAb (anti-Thy-1)	*Rattus norvegicus / Mus musculus*	Dr. David Hoskin (Dalhousie University)
GK1.5	*Rattus norvegicus / Mus musculus*	ATCC TIB-207™; Dr. Bennink; MH (NIH)
H28E23	*Mus musculus*	MH (NIH)
HB-191™	*Mus musculus*	ATCC HB-191™ aka PK136; MH (NIH)
HeLa	*Homo sapiens*	MH (NIH)
J774 4-16	*Mus musculus*	
JAWSII 4-25	*Mus musculus*	ATCC CRL-11904; MH (NIH)
Jurkat CL1.g	*Homo sapiens*	
K562	*Homo sapiens*	ATCC CCL-243™; MH (NIH)
K562 Parental	*Homo sapiens*	
KD2SV	*Mus musculus*	MH (NIH)
LDb	*Mus musculus*	MH (NIH)
LG-2	*Homo sapiens*	Dr. John McCormick (UWO)
LKb	*Mus musculus*	MH (NIH)
LTA-5	*Mus musculus*	MH (NIH)
MC57G	*Mus musculus* C57BL/6J	ATCC CRL-2295™
MT-5B	*Mus musculus*	Dr. Bhagi Singh (UWO)
N37-1A12	*Mus musculus*	Dr. Kyoko Hayakawa (Fox Chase Cancer Center)
N38-2C12	*Mus musculus*	Dr. Kyoko Hayakawa (Fox Chase Cancer Center)
N38-3C3	*Mus musculus*	Dr. Kyoko Hayakawa (Fox Chase Cancer Center)
NA2-8C4	*Mus musculus*	MH (NIH)
P815	*Mus musculus*	ATCC TIB-64™
P815-Fas	*Mus musculus*	Dr. David Hoskin (Dalhousie University)
PAb101	*Mus musculus*	Dr. Dan Simmons (University of Delaware)
RMA 12-12	*Mus musculus*	
RMA-S CD1d	*Mus musculus*	Dr. Steven Porcelli
RMA-S WT	*Mus musculus*	Dr. Steven Porcelli
RMA/S	*Mus musculus*	MH (NIH)
SS SV	*Mus musculus*	MH (NIH)
SVKxD	*Mus musculus*	MH (NIH)
T2 9-19	*Homo sapiens*	MH (NIH)
TIB-210	*Rattus norvegicus / Mus musculus*	ATCC TIB-210™ ("2.43"); MH (NIH)
TIB-222	*Rattus norvegicus / Mus musculus*	ATCC TIB-222™ ("PC61", "PC 61.5.3", "PC 61 5.3"); MH (NIH)
TK-143	*Homo sapiens*	MH (NIH)
TK-143B	*Homo sapiens*	ATCC CRL-8303; MH (NIH)
VERO	*Cercopithecus aethiops*	ATCC CCL-81™
YAC1	*Mus musculus*	ATCC TIB-160™; MH (NIH)
X63-AG8	*Mus musculus*	MH (NIH)

ATCC

MATERIAL SAFETY DATA SHEET

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

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

ATCC Emergency Telephone: (703) 365-2710 (24 hours)
Chemtrec: (800) 424-9300
To be used only in the event of an emergency involving a spill, leak, fire, exposure or accident.

Description

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

SECTION I
Hazardous Ingredients

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

SECTION II
Physical data

Pink or red aqueous liquid

SECTION III
Health hazards

For Biosafety Level 1 Cell Lines

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

For Biosafety Level 2 Cell Lines

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

SECTION IV
Fire and explosion

Not applicable

SECTION V

Reactivity data

Stable. Hazardous polymerization will not occur.

SECTION VI

Method of disposal

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

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

SECTION VII

Special protection information

For Biosafety Level 1 Cell Lines

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

For Biosafety Level 2 Cell Lines

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

SECTION VIII

Special precautions or comments

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

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

February 2002

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The Global Bioresource Center

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Product Description

Before submitting an order you will be asked to read and accept the terms and conditions of ATCC's Material Transfer Agreement or, in certain cases, an MTA specified by the depositing institution.

Customers in Europe, Australia, Canada, China, Hong Kong, India, Israel, Japan, Korea, Macau, Mexico, New Zealand, Singapore, and Taiwan, R.O.C. must contact a local distributor for pricing information and to place an order for ATCC cultures and products.

Print this Page

Cell Biology

ATCC® Number: CCL-243™ Order this Item **Price:** $256.00

Designations: K-562

Depositors: HT Holden

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: *Homo sapiens* (human)

Morphology: lymphoblast

Source: **Organ:** bone marrow
Disease: chronic myelogenous leukemia (CML)

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.

Applications: transfection host (Nucleofection technology from Lonza)

Tumorigenic: Yes

Reverse Transcript: negative

Antigen Expression: CD7 (25%)

DNA Profile (STR): Amelogenin: X
CSF1PO: 9,10
D13S317: 8
D16S539: 11,12
D5S818: 11,12
D7S820: 9,11
THO1: 9.3
TPOX: 8,9
vWA: 16

Cytogenetic Analysis:

Related Links ▸

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Material Transfer Agreement
Technical Support
Related Cell Culture Products

The stemline chromosome number is triploid with the 2S component occurring at 4.2%. Fifteen markers (M1 and M(15)) occurred in nearly all S metaphases. Spontaneous non-specific dicentrics occurred, but rarely. Unstable markers were also rarely seen. The X was disomic, and N9 was nullisomic.

Isoenzymes:
AK-1, 1
ES-D, 1
G6PD, B
GLO-I, 2
Me-2, 0
PGM1, 0
PGM3, 1

Age: 53 years

Gender: female

Comments:
The continuous cell line K-562 was established by Lozzio and Lozzio from the pleural effusion of a 53-year-old female with chronic myelogenous leukemia in terminal blast crises. [22609]
The cell population has been characterized as highly undifferentiated and of the granulocytic series. [26059]
Studies conducted by Anderson, et al., on the surface membrane properties led to the conclusion that the K-562 was a human erythroleukemia line. [26060]
The K-562 cell line has attained widespread use as a highly sensitive in vitro target for the natural killer assay. [48829] [1101] [48830]
See Pross, et al. for a detailed analysis of the in vitro assay of NK cells including the mathematics of quantitation of NK cell activity. [48833]
K-562 blasts are multipotential, hematopoietic malignant cells that spontaneously differentiate into recognizable progenitors of the erythrocytic, granulocytic and monocytic series. [26061]
The effect of inducers on sublines derived from the original K-562 cell line have been reviewed by Koeffler and Golde. [867]
Cultures from the ATCC stock have been shown to exhibit this sensitivity for assessing human natural killer activity.
Karyological studies on various K-562 sublines have been classified into three groups (A,B,C) by Dimery, et al. [26063]
The strain obtained by the ATCC most closely resembles the B population. Occurrence of the Philadelphia chromosome, however, was of much lower frequency; none detected in 15 metaphases examined.
The line is EBNA negative.

Propagation:
ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Iscove's Modified Dulbecco's Medium, Catalog No. 30-2005. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:
Protocol: Cultures can be maintained by the addition or replacement of fresh medium. Start new cultures at 1 X 10 exp5 viable cells/ml. Subculture at 1 X 10 exp6 cells/ml.
Medium Renewal: Every 2 to 3 days

Preservation:
Freeze medium: Complete growth medium 95%; DMSO, 5%
Storage temperature: liquid nitrogen vapor temperature

Related Products:
Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2005
recommended serum:ATCC 30-2020
purified DNA:ATCC CCL-243D
purified RNA:ATCC CCL-243R

References:

867: Koeffler HP, Golde DW. Human myeloid leukemia cell lines: a review. Blood 56: 344-350, 1980. PubMed: 6996765
1101: Ortaldo JR, et al. Specificity of natural cytotoxic reactivity of normal human lymphocytes against a myeloid leukemia cell line. J. Natl. Cancer Inst. 59: 77-82, 1977. PubMed: 69036
22609: Lozzio CB, Lozzio BB. Human chronic myelogenous leukemia cell-line with positive Philadelphia chromosome. Blood 45: 321-334, 1975. PubMed: 163658
26059: Lozzio BB, Lozzio CB. Properties and usefulness of the original K-562 human myelogenous leukemia cell line. Leuk. Res. 3: 363-370, 1979. PubMed: 95026
26060: Andersson LC, et al. K562--a human erythroleukemic cell line. Int. J. Cancer 23: 143-147, 1979. PubMed: 367973
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32357: Chan YJ, et al. Two distinct upstream regulatory domains containing multicopy cellular transcription factor binding sites provide basal repression and inducible enhancer characteristics to the immediate-early IES (US3) promoter from human cytomegalovirus. J. Virol. 70: 5312-5328, 1996. PubMed: 8764042
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Cell Biology

Jurkat CL1.g

ATCC® Number: CRL-2678™ Order this Item

Price: $338.00

Designations: J.gamma1

Depositors: RT Abraham

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: clusters in suspension

Organism: *Homo sapiens* (human)

Morphology: lymphoblast

Source: **Disease:** acute T cell leukemia

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.

DNA Profile (STR): Amelogenin: X
CSF1PO: 11,12
D13S317: 8,12
D16S539: 11
D5S818: 9
D7S820: 8,12
THO1: 6,9.3
TPOX: 8,10
vWA: 18,19

Gender: male

Comments:

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	The J.gamm1 cell line is a phospholipase C-gamma1 (PLC-gamma1) deficient mutant of the E6-1 clone of Jurkat (ATCC TIB-152). The J.gamma1.WT derivative (ATCC CRL-2679) stably expresses PLC-gamma1at levels comparable to the Jurkat cell line. [51314] Wild-type Jurkat cells were mutagenized with the frameshifting mutagen ICR-191 and clones were isolated that failed to increase calcium in response to pervanadate. The selection procedure was repeated on the P98 clone to establish the J.gamma1 cell line. [51314] The J.gamma1 subline contains no detectable PLC-gamma1 protein. The lack of PLC-gamma1 expression in J.gamma1 cells causes profound defects in T cell receptor (TCR) calcium mobilization and nuclear factor of activated T-cells (NFAT) activation. [51314] These transcriptional defects are reversed by transfection of P98 cells with a wild-type PLC-gamma1 expression vector. [51314]
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Temperature:** 37.0°C
Subculturing:	**Medium Renewal:** Add fresh medium every 2 to 3 days (depending on cell density) Cultures can be maintained by the addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 1 to 2 X 10 exp5 viable cells/ml. Maintain cell density between 1 X 10 exp5 and 2 to 3 X 10 exp6 viable cells/ml.
Preservation:	culture medium 95%; DMSO, 5%
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001 recommended serum:ATCC 30-2020 derivative:ATCC CRL-2679 parental cell line:ATCC TIB-152
References:	51314: Irvin BJ, et al. Pleiotropic contributions of phospholipase C-gamma1 (PLC-gamma1) to T-cell antigen receptor-mediated signaling reconstitution studies of a PLC-gamma1-deficient Jurkat T-cell line. Mol. Cell. Biol. 20: 9149-9161, 2000. PubMed: 11094067

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Cell Biology

ATCC® Number: CRL-2295™ Order this Item **Price:** $438.00

Designations: MC57G

Depositors: B Knowles

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Mus musculus* (mouse)

Morphology:

Source:
Strain: C57BL/6J
Disease: fibrosarcoma
Cell Type: methylcholanthrene induced

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

Comments: The MC57G is a fibrosarcoma cell line established from a tumor arising in a C57BL/6 mouse after treatment with methylcholanthrene. The cell line has been used extensively since 1976 as an H-2b cell line for cell-mediated cytotoxicity assays; the cells express both H-2Kb and H-2Db. This cell line is the laboratory standard in many laboratories for mouse viral immunity studies. MC57G is infectible by viruses.

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:

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Protocol:

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin - 0.53 mM EDTA solution to remove all traces of serum which contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes).
   Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.
6. Incubate cultures at 37C.

Subcultivation Ratio: A subcultivation ratio of 1:6 to 1:12 is recommended
Medium Renewal: Every 2 to 3 days

Preservation:
Freeze medium: culture medium, 95%; DMSO, 5%
Storage temperature: liquid nitrogen vapor phase

Related Products:
Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003
recommended serum:ATCC 30-2020
0.25% (w/v) Trypsin - 0.53 mM EDTA in Hank' BSS (w/o Ca++, Mg++):ATCC 30-2101
Cell culture tested DMSO:ATCC 4-X

References:

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Cell Biology

ATCC® Number: TIB-64™ Order this Item

Price: $289.00

Designations: P815

Depositors: P Ralph

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension (some adherent cells)

Organism: *Mus musculus* (mouse)

Morphology:

Source:
Disease: mastocytoma
Strain: DBA/2
Cell Type: mast cell;

Cellular Products: lysozyme [1080]

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.

Applications: transfection host (Nucleofection technology from Lonza)

Comments: P815 cells phagocytose latex beads but not zymosan or BCG.
They do not function in antibody dependent cell mediated cytotoxicity.
Growth of the cells is not inhibited by dextran sulfate, LPS or PPD. [1136] [2104]
Tested and found negative for ectromelia virus (mousepox).

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Dulbecco's Modified Eagle's Medium, Catalog No. 30-2002. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Temperature: 37.0°C

Subculturing: **Medium Renewal:** Every 2 to 3 days
Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 2 X 10 exp5 cells/ml and maintain between 1 X 10 exp5 and 1 X 10 exp6 cells/ml. Adherent cells can be recovered by scraping.

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- Related Cell Culture Products

Preservation: culture medium 95%; DMSO, 5%

Related Products: Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2002
recommended serum:ATCC 30-2020

References:

1080: Ralph P, et al. Lysozyme synthesis by established human and murine histiocytic lymphoma cell lines. J. Exp. Med. 143: 1528-1533, 1976. PubMed: 1083890
1135: Ralph P, Nakoinz I. Antibody-dependent killing of erythrocyte and tumor targets by macrophage-related cell lines: enhancement by PPD and LPS. J. Immunol. 119: 950-954, 1977. PubMed: 894031
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Cell Biology

ATCC® Number: TIB-210™ Order this Item

Price: $323.00

Designations: 2.43

Depositors: FW Fitch

Isotype: IgG2b

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: Rattus norvegicus (B cell); Mus musculus (myeloma) (rat (B cell); mouse (myeloma))

Morphology: lymphoblast

Source: **Cell Type: hybridoma:** B lymphocyte;

Cellular Products: immunoglobulin; monoclonal antibody; against Lyt-2.2 (mouse cytotoxic, suppressor T cell antigen)

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

Comments: Animals were immunized with CTL Clone L3 cells.
Spleen cells were fused with Sp2/0-Ag14 myeloma cells.
Tested and found negative for ectromelia virus (mousepox).

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Dulbecco's Modified Eagle's Medium, Catalog No. 30-2002. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Temperature: 37.0°C

Subculturing: **Medium Renewal:** Every 2 to 3 days
Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 5 x 10 exp4 cells/ml and maintain between 4 x 10 exp4 and 5 x 10 exp5 cells/ml.

Preservation: culture medium 95%; DMSO, 5%

Related Products:

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Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2002
recommended serum:ATCC 30-2020

References:

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Cell Biology

ATCC® Number: CCL-2™ Order this Item

Price: $256.00

Designations: HeLa

Depositors: WF Scherer

Biosafety Level: 2 [CELLS CONTAIN PAPOVAVIRUS]

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Homo sapiens* (human)

Morphology: epithelial

PHOTO

Source:
Organ: cervix
Disease: adenocarcinoma
Cell Type: epithelial

Cellular Products:
keratin
Lysophosphatidylcholine (lyso-PC) induces AP-1 activity and c-jun N-terminal kinase activity (JNK1) by a protein kinase C-independent pathway [26623]

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.

Applications:
transfection host ([21491] Nucleofection technology from Lonza
Roche FuGENE® Transfection Reagents)
screening for Escherichia coli strains with invasive potential [21447] [21491]

Virus Susceptibility:
Human adenovirus 3
Encephalomyocarditis virus
Human poliovirus 1
Human poliovirus 2
Human poliovirus 3

Reverse Transcript: negative

DNA Profile (STR):

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Amelogenin: X
CSF1PO: 9,10
D13S317: 12,13.3
D16S539: 9,10
D5S818: 11,12
D7S820: 8,12
THO1: 7
TPOX: 8,12
vWA: 16,18

Cytogenetic Analysis: Modal number = 82; range = 70 to 164.
There is a small telocentric chromosome in 98% of the cells. 100% aneuploidy in 1385 cells examined. Four typical HeLa marker chromosomes have been reported in the literature.HeLa Marker Chromosomes: One copy of M1, one copy of M2, four-five copies of M3, and two copies of M4 as revealed by G-banding patterns. M1 is a rearranged long arm and centromere of chromosome 1 and the long arm of chromosome 3. M2 is a combination of short arm of chromosome 3 and long arm of chromosome 5. M3 is an isochromosome of the short arm of chromosome 5. M4 consists of the long arm of chromosome 11 and an arm of chromosome 19.

Isoenzymes: G6PD, A

Age: 31 years adult

Gender: female

Ethnicity: Black

HeLa Markers: Y

Comments: The cells are positive for keratin by immunoperoxidase staining.
HeLa cells have been reported to contain human papilloma virus 18 (HPV-18) sequences.
P53 expression was reported to be low, and normal levels of pRB (retinoblastoma suppressor) were found.

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing: **Protocol:**

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin- 0.53 mM EDTA solution to remove all traces of serum which contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes).
   Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37°C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.
6. Incubate cultures at 37°C.

Subcultivation Ratio: A subcultivation ratio of 1:2 to 1:6 is recommended
Medium Renewal: 2 to 3 times per week

Preservation: **Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Related Products: Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003
recommended serum:ATCC 30-2020
derivative:ATCC CCL-2.1
derivative:ATCC CCL-2.2
derivative:ATCC CCL-2.3

References:

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Cell Biology

ATCC® Number: TIB-222™ Order this Item

Price: $323.00

Designations: PC 61 5.3 [PC 61, PC 61.5.3]

Depositors: M Nabholz

Isotype: IgG1 , IgG1

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: Rattus norvegicus (B cell); Mus musculus (myeloma) (rat (B cell); mouse (myeloma))

Morphology: lymphoblast

Source: **Cell Type: hybridoma:** B lymphocyte;

Cellular Products: immunoglobulin; monoclonal antibody; against mouse interleukin-2 (interleukin 2, IL-2) receptor (CD25)

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

Comments: Animals were immunized with the B6.1 mouse cytotoxic T cell line.
Spleen cells were fused with P3X63Ag8.653 myeloma cells.
The antibody blocks IL-2 binding and IL-2 dependent growth stimulation, and immunoprecipitates IL-2 receptors.
Tested and found negative for ectromelia virus (mousepox).

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Dulbecco's Modified Eagle's Medium, Catalog No. 30-2002. To make the complete growth medium, add the following components to the base medium: 2-mercaptoethanol to a final concentration of 0.05 mM; fetal bovine serum to a final concentration of 10%.
Temperature: 37.0°C
Atmosphere: air, 95%; carbon dioxide (CO2), 5%

Subculturing:

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- Related Cell Culture Products

	Protocol: Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 1 X 10 exp5 cells/ml and maintain between 1 X 10 exp5 and 5 X 10 exp5 cells/ml. **Medium Renewal:** Add fresh medium every 2 to 4 days (depending on cell density)
Preservation:	**Freeze medium:** Complete growth medium 92.5%; DMSO, 7.5% **Storage temperature:** liquid nitrogen vapor phase
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2002 recommended serum:ATCC 30-2020
References:	996: Trowbridge IS, et al. Murine cell surface transferrin receptor: studies with an anti-receptor monoclonal antibody. J. Cell. Physiol. 112: 403-410, 1982. PubMed: 6290505 1315: Zubler RH, et al. Activated B cells express receptors for, and proliferate in response to, pure interleukin-2. J. Exp. Med. 160: 1170-1183, 1984. PubMed: 6434689

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ATCC® Number: TIB-160™ Order this Item

Price: $281.00

Designations: YAC-1

Depositors: JY Djeu

Biosafety Level: 2

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: *Mus musculus* (mouse)

Morphology: lymphoblast

Source:
Disease: lymphoma
Strain: A/Sn
Cell Type: Moloney murine leukemia virus (Mo-MuLV) induced

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.

Applications: assay of NK cell activity ([22345] [49299] The cells are sensitive to the action of natural killer (NK) cells and are useful in assays of NK cell activity.)

Comments: Tested and found negative for ectromelia virus (mousepox).

Propagation:
ATCC complete growth medium: The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:
Protocol: Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 3 X 10(5) cells/ml and maintain between 2 X 10 (5) and 2 X 10(6) cells/ml.
Medium Renewal: Every 2 to 3 days

Preservation:
Freeze medium: Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

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Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001
recommended serum:ATCC 30-2020
Cell culture tested DMSO:ATCC 4-X

References:

22345: Kiessling R, et al. "Natural" killer cells in the mouse. I. Cytotoxic cells with specificity for mouse Moloney leukemia cells. Specificity and distribution according to genotype. Eur. J. Immunol. 5: 112-117, 1975. PubMed: 1234049
26348: Cikes M, et al. Progressive loss of H-2 antigens with concomitant increase of cell- surface antigen(s) determined by Moloney leukemia virus in cultured murine lymphomas. J. Natl. Cancer Inst. 50: 347-362, 1973. PubMed: 4573851
32552: Okazaki IJ, et al. Cloning and characterization of a novel membrane-associated lymphocyte NAD:arginine ADP-ribosyltransferase. J. Biol. Chem. 271: 22052-22057, 1996. PubMed: 8703012
49299: Kiessling R, et al. "Natural" killer cells in the mouse. II. Cytotoxic cells with specificity for mouse Moloney leukemia cells. Characteristics of the killer cell. Eur. J. Immunol. 5: 117-121, 1975. PubMed: 1086218

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Cell Biology

ATCC® Number: CRL-1975™ Order this Item **Price:** $323.00

Designations: 145-2C11

Depositors: JA Bluestone

Isotype: IgG , IgG

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: Cricetulus migratorius (B cell); Mus musculus (myeloma) (hamster, Armenian (B cell); mouse (myeloma))

Morphology: lymphoblast

Source: **Cell Type: hybridoma:** B lymphocyte;

Cellular Products: immunoglobulin; monoclonal antibody; against mouse CD3

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

Comments: Animals were immunized with the BM10-37 mouse cytotoxic T lymphocyte (CTL) cell clone (anti H-2 Kb).
Spleen cells were fused with Sp2/0-Ag14 myeloma cells.
The antibody reacts with the murine T cell receptor (CD3 - T3) complex.
The antibody is specific for a 25000 dalton protein component (CD3 epsilon) of the antigen specific T cell receptor.
It reacts with all mature T cells and can both activate and inhibit T cell function.
The antibody does not react with peripheral blood lymphocytes from rats, rabbits, miniature swine or hamsters.

Propagation:

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	ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Iscove's Modified Dulbecco's Medium, Catalog No. 30-2005. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Temperature:** 37.0°C **Atmosphere:** air, 95%; carbon dioxide (CO2), 5%
Subculturing:	**Protocol:** Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 2 X 10 exp5 cells/ml and maintain between 1 X 10 exp5 and 1 X 10 exp6 cells/ml. **Medium Renewal:** Every 2 to 3 days
Preservation:	**Freeze medium:** Complete growth medium, 95%; DMSO, 5% **Storage temperature:** liquid nitrogen vapor phase
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2005 recommended serum:ATCC 30-2020
References:	23298: Leo O, et al. Identification of a monoclonal antibody specific for a murine T3 polypeptide. Proc. Natl. Acad. Sci. USA 84: 1374-1378, 1987. PubMed: 2950524 28992: Kayagaki N, et al. Polymorphism of murine Fas ligand that affects the biological activity. Proc. Natl. Acad. Sci. USA 94: 3914-3919, 1997. PubMed: 9108079

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Cell Biology

ATCC® Number: HB-197™ Order this Item

Price: $323.00

Designations: 2.4G2

Depositors: JC Unkeless

Isotype: IgG2b

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: Rattus norvegicus (B cell); Mus musculus (myeloma) (rat (B cell); mouse (myeloma))

Morphology: lymphoblast

Source: **Cell Type: hybridoma:** B lymphocyte;

Cellular Products: immunoglobulin; monoclonal antibody; against the Fc gamma receptor (FcRII, CD32)

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.

Tumorigenic: Yes

Comments: Animals were immunized with the J774 mouse macrophage cell line.
Spleen cells were fused with P3U1 myeloma cells.
The antibody reacts with and immunoprecipitates the 50000 dalton to 70000 dalton Fc gamma receptor on macrophages and Fc gamma bearing lymphoid cells.
The antibody can be used to block non-specific binding to Fc gamma bearing cells.
Tested and found negative for ectromelia virus (mousepox).

Propagation: **ATCC complete growth medium:** Dulbecco's modified Eagle's medium with 4 mM L-glutamine adjusted to contain 1.5 g/L sodium bicarbonate and 4.5 g/L glucose, 90%; horse serum, 5%; fetal bovine serum, 5%
Temperature: 37.0°C
Atmosphere: air, 95%; carbon dioxide (CO2), 5%

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Medium Renewal: Add fresh medium every 2 to 3 days (depending on cell density)
Cultures can be maintained by the addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 1 to 2 X 10 exp5 viable cells/ml.
Maintain cell density between 1 X 10 exp5 and 1 X 10 exp6 viable cells/ml.

Preservation: culture medium 95%; DMSO, 5%

Related Products: Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2002
recommended serum:ATCC 30-2020
recommended serum:ATCC 30-2040

References:

1631: Unkeless JC. Characterization of a monoclonal antibody directed against mouse macrophage and lymphocyte Fc receptors. J. Exp. Med. 150: 580-596, 1979. PubMed: 90108
1632: Mellman IS, Unkeless JC. Purification of a functional mouse Fc receptor through the use of a monoclonal antibody. J. Exp. Med. 152: 1048-1069, 1980. PubMed: 6158545
1634: Nussenzweig MC, et al. Studies of the cell surface of mouse dendritic cells and other leukocytes. J. Exp. Med. 154: 168-187, 1981. PubMed: 7252426
27575: Yoshikai Y, et al. Clonal expansion of superantigen-reactive T cells is resistant to FK506 in mice with AIDS. J. Virol. 71: 746-749, 1997. PubMed: 8985410
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Cell Biology

ATCC® Number: TIB-207™ Order this Item

Price: $268.00

Designations: GK1.5

Depositors: FW Fitch

Isotype: rat IgG2b

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: Rattus norvegicus (B cell); Mus musculus (myeloma) (rat (B cell); mouse (myeloma))

Morphology: lymphoblast

Source: **Organ:** spleen
Cell Type: hybridoma: B lymphocyte;

Cellular Products: immunoglobulin; monoclonal antibody; against mouse helper, inducer T cells (L3T4 antigen, CD4)

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

Comments: Animals were immunized with the cloned cytotoxic T lymphocyte lines V4 and 243/2.5.
Spleen cells were fused with Sp2/0-Ag14 myeloma cells.
L3T4 is expressed on mouse helper/inducer T cells and is analogous to the human Leu-3/T4 molecule. [58010]
The antibody profoundly blocks antigen specific murine class II MHC antigen reactive helper T lymphocyte lines. [58010]
Tested and found negative for ectromelia virus (mousepox).

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Iscove's Modified Dulbecco's Medium, Catalog No. 30-2005. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 20%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:

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Related Cell Culture Products

Protocol: Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 1 X 10(5) cells/ml.
Interval: Maintain between 1 X 10(5) and 1 x 10(6) cells/ml.
Medium Renewal: Every 2 to 3 days

Preservation:
Freeze medium: Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Related Products:
Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2005
recommended serum:ATCC 30-2020

References:

982: Fitch FW, et al. Evidence implicating L3T4 class II MHC antigen reactivity; monoclonal antibody GK1.5 (anti-L3T4a) blocks class II MHC antigen-specific proliferation, release of lymphokines, and binding by cloned murine helper T lymphocyte lines. J. Immunol. 131: 2178-2183, 1983. PubMed: 6195255
983: Dialynas DP, et al. Characterization of the murine T cell surface molecule, designated L3T4, identified by monoclonal antibody GK1.5: similarity of L3T4 to the human Leu-3/T4 molecule. J. Immunol. 131: 2445-2451, 1983. PubMed: 6415170
32309: Garvy BA, Harmsen AG. The role of T cells in infection-driven interstitial pneumonia after bone marrow transplantation in mice. Transplantation 62: 517-525, 1996. PubMed: 8781619
32945: Murray HW, et al. Models of relapse of experimental visceral leishmaniasis. J. Infect. Dis. 173: 1041-1043, 1996. PubMed: 8603949
32947: Wilson ME, et al. Local suppression of IFN-gamma in hepatic granulomas correlates with tissue-specific replication of Leishmania chagasi. J. Immunol. 156: 2231-2239, 1996. PubMed: 8690913
32948: Wong P, Rudensky AY. Phenotype and function of CD4+ T cells in mice lacking invariant chain. J. Immunol. 156: 2133-2142, 1996. PubMed: 8690902
33098: Sayles PC, Johnson LL. Intact immune defenses are required for mice to resist the ts-4 vaccine strain of Toxoplasma gondii. Infect. Immun. 64: 3088-3092, 1996. PubMed: 8757838
33116: Murray HW, et al. Multiple host defense defects in failure of C57BL/6 ep/ep (Pale Ear) mice to resolve visceral Leishmania donovani infection. Infect. Immun. 64: 161-166, 1996. PubMed: 8557335
58010: Dialynas DP, et al. Characterization of the murine antigenic determinant, designated L3T4a, recognized by monoclonal antibody GK1.5: expression of L3T4a by functional T cell clones appears to correlate primarily with class II MHC antigen-reactivity. Immunol. Rev. 74: 29-56, 1983. PubMed: 6195085

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Cell Biology

ATCC® Number: HB-191™ Order this Item

Price: $323.00

Designations: PK136

Depositors: GC Koo

Isotype: IgG2a

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: Mus musculus (B cell); Mus musculus (myeloma) (mouse (B cell); mouse (myeloma))

Morphology: lymphoblast

Source: **Cell Type: hybridoma:** B lymphocyte;

Cellular Products: immunoglobulin; monoclonal antibody; against mouse natural killer (NK) cells

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

Comments: Animals were immunized with spleen and bone marrow cells from CE mice. Spleen cells were fused with Sp2/0-Ag14 myeloma cells.
The antibody is specific for NK cells and is cytotoxic in the presence of complement.
The pattern of reactivity of the antibody with cells of various strains of mice matches the pattern of conventional NK 1.1 antisera.
Tested and found negative for ectromelia virus (mousepox).

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC Hybri-Care Medium, Catalog No. 46-X. Hybri-Care Medium is supplied as a powder and should be reconstituted in 1 L cell-culture-grade water. To make the complete growth medium, add the following components to the base medium:
- fetal bovine serum to a final concentration of 10%
- 1.5 g/L sodium bicarbonate for use with 5% CO2 in air atmosphere.

Temperature: 37.0°C

Subculturing:

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Protocol: Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 1 X 10(5) cells/ml and maintain between 5 X 10 (4) and 1 X 10(6) cells/ml. Do not exceed 1 X 10(6) cells/ml.
Medium Renewal: Every 2 to 3 days

Related Products: recommended serum:ATCC 30-2020
Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 46-X

References:

1319: Koo GC, et al. The NK-1.1 (-) mouse: a model to study differentiation of murine NK cells. J. Immunol. 137: 3742-3747, 1986. PubMed: 3782794
58145: Koo GC, Peppard JR. Establishment of monoclonal anti-NK-1.1 antibody. Hybridoma 3: 301-303, 1984. PubMed: 6500587

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Cell Biology

ATCC® Number: CRL-2113™ Order this Item

Price: $349.00

Designations: E.G7-OVA [derivative of EL4 (see ATCC TIB-39)]

Depositors: MJ Bevan

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: *Mus musculus* (mouse)

Morphology: lymphoblast

Source:
Disease: lymphoma
Strain: C57BL/6N
Cell Type: T lymphocyte;

Cellular Products: chicken ovalbumin

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.

Antigen Expression: H-2 b

Comments:
E.G7-OVA was derived in 1988 from the C57BL/6 (H-2 b) mouse lymphoma cell line EL4 (ATCC TIB-39).
The EL4 cells were transfected by electroporation with the plasmid pAc-neo-OVA which carries a complete copy of chicken ovalbumin (OVA) mRNA and the neomycin (G418) resistance gene.
E.G7-OVA cells contain a single copy of the inserted plasmid and synthesize and secrete OVA constitutively.
C57BL/6 mice immunized with E.G7-OVA cells give rise to H-2 Kb restricted cytotoxic lymphocytes specific for the OVA 258-276 peptide.
This cell line is a model system for studying major histocompatibility complex (MHC) class I restricted responses of cytotoxic T lymphocytes in mice.

Propagation:

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	ATCC complete growth medium: RPMI 1640 medium with 2 mM L-glutamine adjusted to contain 1.5 g/L sodium bicarbonate, 4.5 g/L glucose, 10 mM HEPES and 1.0 mM sodium pyruvate and supplemented with 0.05 mM 2-mercaptoethanol and 0.4 mg/ml G418, 90%; fetal bovine serum, 10% **Temperature:** 37.0°C
Subculturing:	**Medium Renewal:** Every 2 to 3 days Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 2 X 10 exp5 cells/ml and maintain between 1 X 10 exp5 and 1 X 10 exp6 cells/ml.
Preservation:	Culture medium, 95%; DMSO, 5%
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001 recommended serum:ATCC 30-2020 parental cell line:ATCC TIB-39
References:	22630: Moore MW, et al. Introduction of soluble protein into the class I pathway of antigen processing and presentation. Cell 54: 777-785, 1988. PubMed: 3261634

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Cell Biology

ATCC® Number: TIB-39™ Order this Item

Price: $289.00

Designations: EL4

Depositors: M Cohn

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: *Mus musculus* (mouse)

Morphology: lymphoblast

PHOTO

Source: **Disease:** lymphoma
Strain: C57BL/6N
Cell Type: T lymphocyte;

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.

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

Antigen Expression: H-2b; Thy-1.2

Cytogenetic Analysis: modal number = 39

Comments: EL4 was established from a lymphoma induced in a C57BL mouse by 9,10-dimethyl-1,2-benzanthracene. [22448]
The cells are resistant to 0.1 mM cortisol and sensitive to 20 mcg/ml PHA.
A subline (EL4.IL-2, ATCC TIB-181) that produces high levels of interleukin-2 (IL-2, interleukin 2) is available.
Tested and found negative for ectromelia virus (mousepox).

Propagation:

Related Links

- NCBI Entrez Search
- Cell Micrograph
- Make a Deposit
- Frequently Asked Questions
- Material Transfer Agreement
- Technical Support
- Related Cell Culture Products

ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Dulbecco's Modified Eagle's Medium, Catalog No. 30-2002. To make the complete growth medium, add the following components to the base medium: horse serum to a final concentration of 10%.
Temperature: 37.0°C

Subculturing:
Medium Renewal: Every 2 to 3 days
Cultures can be maintained by addition or replacement of fresh medium. Start cultures at 2 X 10 exp5 cells/ml and maintain between 1 X 10 exp5 and 1 X 10 exp6 cells/ml.

Preservation:
culture medium 95%; DMSO, 5%

Related Products:
Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2002
derivative:ATCC CRL-2113
derivative:ATCC TIB-131
derivative:ATCC TIB-40

References:
1104: Ralph P. Retention of lymphocyte characteristics by myelomas and theta+-lymphomas: sensitivity to cortisol and phytohemagglutinin. J. Immunol. 110: 1470-1475, 1973. PubMed: 4541304
22422: Old LJ, et al. The G (Gross) leukemia antigen. Cancer Res. 25: 813-819, 1965. PubMed: 4284252
22448: Gorer PA. Studies in antibody response of mice to tumour inoculation. Br. J. Cancer 4: 372-379, 1950. PubMed: 14801344
22523: Herberman RB. Serological analysis of cell surface antigens of tumors induced by murine leukemia virus. J. Natl. Cancer Inst. 48: 265-271, 1972. PubMed: 4119883
22528: Ralph P, Nakoinz I. Inhibitory effects of lectins and lymphocyte mitogens on murine lymphomas and myelomas. J. Natl. Cancer Inst. 51: 883-890, 1973. PubMed: 4542714
23443: Shevach EM, et al. Immunoglobulin and theta-bearing murine leukemias and lymphomas. J. Immunol. 108: 1146-1151, 1972. PubMed: 4112916
32256: Aparicio CL, et al. Correction for label leakage in fluorimetric assays of cell adhesion. BioTechniques 23: 1056-1060, 1997. PubMed: 9421636
32286: Cuthbert JA, Lipsky PE. Regulation of proliferation and Ras localization in transformed cells by products of mevalonate metabolism. Cancer Res. 57: 3498-3504, 1997. PubMed: 9270019

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Cell Biology

ATCC® Number: CRL-10762™ Order this Item

Price: $438.00

Designations: CTLA4 Ig-24

Depositors: Bristol-Myers Squibb Co.

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: Cricetulus griseus (hamster, Chinese)

Morphology: epithelial

Source: **Organ:** ovary

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.

Gender: female

Comments: The line was constructed by transfecting CHO cells with a construct (CTLA4Ig) containing the sequence for the extracellular domain of the human CTLA-4 gene fused to the sequence for the hinge, CH2 and CH3 regions of human IgC.gamma.1 domain.The cells express the fusion protein (CTLA4Ig).
The cells express the fusion protein (CTLA4Ig).

Propagation: **ATCC complete growth medium:** Dulbecco's modified Eagle's medium with 0.2 mM proline, 0.001 mM methotrexate, 90%; fetal bovine serum, 10%
Temperature: 37.0°C

Subculturing: **Subcultivation Ratio:** A subcultivation ratio of 1:4 to 1:8 is recommended
Medium Renewal: 2 to 3 times per week
Remove medium, add fresh 0.25% trypsin solution for 1 to 2 minutes, remove trypsin and let the culture sit at room temperature until the cells detach. Add fresh medium, aspirate and dispense into new flasks.

References: 4548: Linsley PS. Chimeric CTLA4 receptor and methods for its use. US Patent 5,434,131 dated Jul 18 1995

Related Links ▸
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ATCC® Number: CRL-11904™ Order this Item

Price: $289.00

Designations: JAWSII

Depositors: ZymoGenetics, Inc.

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: mixed, adherent and suspension

Organism: *Mus musculus* (mouse)

Morphology: monocyte

PHOTO

Source:
Organ: bone marrow
Strain: C57BL/6
Cell Type: immature dendritic cell; monocyte;

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.

Propagation:
ATCC complete growth medium: Alpha minimum essential medium with ribonucleosides, deoxyribonucleosides, 4 mM L-glutamine, 1 mM sodium pyruvate and 5 ng/ml murine GM-CSF, 80%; fetal bovine serum, 20%
Temperature: 37.0°C

Subculturing:
Protocol: Cultures can be maintained by transferring floating cells to a centrifuge tube.
Attached cells may be subcultured using 0.25% trypsin-0.03% EDTA.
Pool cells and centrifuge the cell suspension at 1000 rpm for 10 minutes, resuspend the pellet in fresh medium, aspirate and dispense into new flasks.
Note: This cell line grows very slowly.
Subcultivation Ratio: A subcultivation ratio of 1:2 is recommended
Medium Renewal: Once per week

Preservation:
Freeze medium: Complete growth medium 95%; DMSO, 5%
Storage temperature: liquid nitrogen vapor phase

Related Products: recommended serum:ATCC 30-2020

Related Links
- NCBI Entrez Search
- Cell Micrograph
- Make a Deposit
- Frequently Asked Questions
- Material Transfer Agreement
- Technical Support
- Related Cell Culture Products

References:

38868: MacKay VL, Moore EE. Immortalized dendritic cells. US Patent 5,648,219 dated Jul 15 1997
47440: Moore EE. Preparation of immortalized cells. US Patent 5,830,682 dated Nov 3 1998

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Cell Biology

ATCC® Number: CRL-8303™ Order this Item

Price: $323.00

Designations: 143B

Depositors: Wistar Institute

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Homo sapiens* (human)

Morphology: mixed

Source: **Organ:** bone
Disease: osteosarcoma

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.

Applications: transfection host

DNA Profile (STR): Amelogenin: X
CSF1PO: 12
D13S317: 12
D16S539: 10,13
D5S818: 13
D7S820: 11,12
THO1: 6
TPOX: 11
vWA: 18

ıge: 13 year old

ıender: female

thnicity: Caucasian

omments: Thymidine kinase negative (TK-).
This is a human osteosarcoma cell line.

ropagation:

Related Links ▸

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Related Cell Culture Products

ATCC complete growth medium: Minimum essential medium (Eagle) in Earle's BSS with 0.015 mg/ml 5-bromo-2'-deoxyuridine, 90%; fetal bovine serum, 10%
Temperature: 37.0°C

Subculturing:
Medium Renewal: 2 to 3 times per week
Remove medium, rinse with fresh 0.25% trypsin, 0.02% EDTA solution and allow the cells to sit at room temperature (or at 37C) until they detach (about 10 minutes). Add fresh medium, aspirate and dispense into new flasks.

Preservation: 90% FBS; 10% DMSO

Related Products: derivative:ATCC CRL-8304

References:

32372: Berson JF, et al. A seven-transmembrane domain receptor involved in fusion and entry of T-cell-tropic human immunodeficiency virus tyep 1 strains. J. Virol. 70: 6288-6295, 1996. PubMed: 8709256
32519: Roller RJ, et al. Structure and function in the herpes simplex virus 1 RNA-binding protein US11: mapping of the domain required for ribosomal and nucleolar association and RNA binding in vitro. J. Virol. 70: 2842-2851, 1996. PubMed: 8627758
33047: Hofhaus G, et al. Respiration and growth defects in transmitochondrial cell lines carrying the 11778 mutation associated with Leber's hereditary optic neuropathy. J. Biol. Chem. 271: 13155-13161, 1996. PubMed: 8662757
33152: Hocking AM, et al. Eukaryotic expression of recombinant biglycan. J. Biol. Chem. 271: 19571-19577, 1996. PubMed: 8702651

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Cell Biology

ATCC® Number: HTB-37™ Order this Item

Price: $272.00

Designations: Caco-2

Depositors: J Fogh

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Homo sapiens* (human)

Morphology: epithelial

PHOTO

Source:
Organ: colon
Disease: colorectal adenocarcinoma

Cellular Products:
keratin
retinoic acid binding protein 1
retinol binding protein 2

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.

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

Receptors:
heat stable enterotoxin (Sta, E. coli), expressed
epidermal growth factor (EGF), expressed

Virus Susceptibility: Human immunodeficiency virus 1

Related Links
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- Cell Micrograph
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- Material Transfer Agreement
- Technical Support
- Related Cell Culture Products

Tumorigenic: Yes

Reverse Transcript: N

DNA Profile (STR):
Amelogenin: X
CSF1PO: 11
D13S317: 11,13,14
D16S539: 12,13
D5S818: 12,13
D7S820: 11,12
TH01: 6
TPOX: 9,11
vWA: 16,18

Cytogenetic Analysis: The stemline modal chromosome number is 96, occurring at 16% with polyploidy at 3.2%. Ten common markers were detected i.e., t(1q;?), 10q-, t(11q17q) and 7 others. The t(1q17q) and M11 were found in a portion of cells. The ins(2), 10q-, and t(15q;?) were generally paired, and t(11q;17q) and t(21q;?) were mostly three-copied. Normal N9 was absent, and N21 was lost in some cells. One to 4 small acrocentric chromosomes were detected. No Y chromosome with bright distal q-band was detected by Q-observation.

Isoenzymes:
AK-1, 1
ES-D, 1
G6PD, B
GLO-I, 1
Me-2, 1
PGM1, 1
PGM3, 1

Age: 72 years adult

Gender: male

Ethnicity: Caucasian

HeLa Markers: N

Comments: Upon reaching confluence, the cells express characteristics of enterocytic differentiation [PubMed ID: 1939345]. Caco-2 cells express retinoic acid binding protein I and retinol binding protein II [PubMed ID: 9040537].

Propagation:
ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 20%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:
Protocol:

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin - 0.53 mM EDTA solution to remove all traces of serum which contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes).
   Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.The recommended inoculum is 1 X 10(4) viable cells/cm2. Subculture cells when they are about 80% confluent, at a cell concentration between 8 X 10(4) and 1 X 10(5) cell/cm2.
6. Incubate cultures at 37C.

Subcultivation Ratio: A subcultivation ratio of 1:4 to 1:6 is recommended
Medium Renewal: 1 to 2 times per week

Preservation:
Freeze medium: Complete growth medium, 95%; DMSO, 5%
Storage temperature: liquid nitrogen vapor temperature

Doubling Time: about 62 hours

Related Products:

Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003
recommended serum:ATCC 30-2020
derivative:ATCC CRL-2102
0.25% (w/v) Trypsin - 0.53 mM EDTA in Hank' BSS (w/o Ca++, Mg++):ATCC 30-2101
Cell culture tested DMSO:ATCC 4-X

References:

18385: Didier ES, et al. Characterization of Encephalitozoon (Septata) intestinailis isolates cultured from nasal mucosa and bronchoalveolar lavage fluids of two AIDS patients. J. Eukaryot. Microbiol. 43: 34-43, 1996. PubMed: 8563708
22409: Jumarie C, Malo C. Caco-2 cells cultured in serum-free medium as a model for the study of enterocytic differentiation in vitro. J. Cell. Physiol. 149: 24-33, 1991. PubMed: 1939345
22536: Fogh J, et al. Absence of HeLa cell contamination in 169 cell lines derived from human tumors. J. Natl. Cancer Inst. 58: 209-214, 1977. PubMed: 833871
22539: Fogh J, et al. One hundred and twenty-seven cultured human tumor cell lines producing tumors in nude mice. J. Natl. Cancer Inst. 59: 221-226, 1977. PubMed: 327080
22564: Adachi A, et al. Productive, persistent infection of human colorectal cell lines with human immunodeficiency virus. J. Virol. 61: 209-213, 1987. PubMed: 3640832
22861: Trainer DL, et al. Biological characterization and oncogene expression in human colorectal carcinoma cell lines. Int. J. Cancer 41: 287-296, 1988. PubMed: 3338874
23009: Cohen MB, et al. Receptors for Escherichia coli heat stable enterotoxin in human intestine and in a human intestinal cell line (Caco-2). J. Cell. Physiol. 156: 138-144, 1993. PubMed: 8100232
23012: Basson MD, et al. Effect of tyrosine kinase inhibition on basal and epidermal growth factor-stimulated human Caco-2 enterocyte sheet migration and proliferation. J. Cell. Physiol. 160: 491-501, 1994. PubMed: 8077287
23118: Heinen CD, et al. Microsatellite instability in colorectal adenocarcinoma cell lines that have full-length adenomatous polyposis coli protein. Cancer Res. 55: 4797-4799, 1995. PubMed: 7585508
23148: Gilbert T, Rodriguez-Boulan E. Induction of vacuolar apical compartments in the Caco-2 intestinal epithelial cell line. J. Cell Sci. 100: 451-458, 1991. PubMed: 1808199
23191: Rigothier MC, et al. A new in vitro model of Entamoeba histolytica adhesion, using the human colon carcinoma cell line Caco-2: scanning electron microscopic study. Infect. Immun. 59: 4142-4146, 1991. PubMed: 1937772
23416: Levin MS. Cellular retinol-binding proteins are determinants of retinol uptake and metabolism in stably transfected Caco-2 cells. J. Biol. Chem. 268: 8267-8276, 1993. PubMed: 8463337
23563: Trotter PJ, Storch J. Fatty acid esterification during differentiation of the human intestinal cell line Caco-2. J. Biol. Chem. 268: 10017-10023, 1993. PubMed: 8387510
25093: Santoro IM, Groden J. Alternative splicing of the APC gene and its association with terminal differentiation. Cancer Res. 57: 488-494, 1997. PubMed: 9012479
32376: White LJ, et al. Attachment and entry of recombinant norwalk virus capsids to cultured human and animal cell lines. J. Virol. 70: 6589-6597, 1996. PubMed: 8794293
32562: Baier LJ, et al. A polymorphism in the human intestinal fatty acid binding protein alters fatty acid transport across Caco-2 cells. J. Biol. Chem. 271: 10892-10896, 1996. PubMed: 8631905
32794: Kutchera W, et al. Protaglandin H synthase 2 is expressed abnormally in human colon cancer: evidence for a transcriptional effect. Proc. Natl. Acad. Sci. USA 93: 4816-4820, 1996. PubMed: 8643486
33127: Grindstaff KK, et al. Translational regulation of Na,K-ATPase alpha1 and beta1 polypeptide expression in epithelial cells. J. Biol. Chem. 271: 23211-23221, 1996. PubMed: 8798517

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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)

Morphology: epithelial

PHOTO

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)
viruscide testing [92579]

Receptors: vitronectin, expressed

Tumorigenic: Yes

DNA Profile (STR):

Related Links
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Amelogenin: X
CSF1PO: 11,12
D13S317: 12,14
D16S539: 9,13
D5S818: 8,9
D7S820: 11,12
THO1: 7,9.3
TPOX: 11
vWA: 16,19

Cytogenetic Analysis: This is a hypotriploid human cell line. The modal chromosome number was 64, occurring in 30% of cells. The rate of cells with higher ploidies was 4.2 %. The der(1)t(1;15) (q42;q13), der(19)t(3;19) (q12;q13), der(12)t (8;12) (q22;p13), and four other marker chromosomes were common to most cells. Five other markers occurred in some cells only. The marker der (1) and M8 (or Xq+) were often paired. There were four copies of N17 and N22. Noticeably in addition to three copies of X chromosomes, there were paired Xq+, and a single Xp+ in most cells.

Age: fetus

Comments: Although an earlier report suggested that the cells contained Adenovirus 5 DNA from both the right and left ends of the viral genome [RF32764], it is now clear that only left end sequences are present. [39768]
The line is excellent for titrating human adenoviruses.
The cells express an unusual cell surface receptor for vitronectin composed of the integrin beta-1 subunit and the vitronectin receptor alpha-v subunit. [23406]
The Ad5 insert was cloned and sequenced, and it was determined that a colinear seqment from nts 1 to 4344 is integrated into chromosome 19 (19q13.2). [39768]

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C
The cell line does not adhere to the substrate when left at room temperature for any length of time, therefore, live cultures may be received with the cells detached.The cells will re-attach to the flask over a period of several days in culture at 37C.

Subculturing: **Protocol:**

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin- 0.53 mM EDTA solution to remove all traces of serum that contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes).
   Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37°C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.An inoculum of 2 X 10 (3) to 6 X 10 (3) viable cells/cm2 is recommended.
6. Incubate cultures at 37°C.6. Subculture when cell concentration is between 6 and 7 X 10(4) cells/cm2.

Subcultivation Ratio: 1:10 to 1:20 weekly.
Medium Renewal: Every 2 to 3 days

Preservation: **Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Related Products:

Recommended medium (without the additional supplements or serum described under ATCC Medium): ATCC 30-2003
derivative: ATCC CRL-10852
derivative: ATCC CRL-12006
derivative: ATCC CRL-12007
derivative: ATCC CRL-12013
derivative: ATCC CRL-12479
derivative: ATCC CRL-2029
derivative: ATCC CRL-2368
purified DNA:ATCC CRL-1573D

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Cell Biology

ATCC® Number: TIB-67™ Order this Item

Price: $256.00

Designations: J774A.1 J774-1 4-16

Depositors: P Ralph

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Mus musculus* (mouse)

Morphology: macrophage

PHOTO

Source:
Tissue: ascites
Strain: BALB/cN
Disease: reticulum cell sarcoma
Cell Type: monocyte/macrophage macrophage;

Cellular Products:
interleukin 1 beta
lysozyme [1080]

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.

Isolation:
La Jolla California, United States
Isolation date: 1968

Applications:
Biological response [92560]
transfection host (Roche FuGENE® Transfection Reagents)

Receptors:
complement (C3), expressed [1135]
Fc receptor, IgG, high affinity I (Fcgr1), expressed [13710]

Age: adult

Gender: female

Comments:

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J774A.1 cells are active in antibody dependent phagocytosis [Pubmed: 1101071]. Their growth is inhibited by dextran sulfate, PPD and LPS [Pubmed: 318922]. They synthesize large amounts of lysozyme and exhibits minor cytolysis but predominantly antibody-dependent phagocytosis. Interleukin 1 beta (Il1b) is synthesized continuously by this line.

Propagation:
ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Dulbecco's Modified Eagle's Medium, Catalog No. 30-2002. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:
Protocol: Subcultures are prepared by scraping.
For a 75 cm2 flask, remove all but 10 ml of the culture medium. (adjust volume accordingly for different culture vessels) Dislodge cells from the flask substrate with a cell scraper, aspirate and dispense into new flasks.
Subcultivation Ratio: A subcultivation ratio of 1:3 to 1:6 is recommended
Medium Renewal: Replace or add medium two or three times weekly

Preservation:
Freeze medium: Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Doubling Time:
17 hours

Related Products:
Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2002
recommended serum:ATCC 30-2020
purified RNA:ATCC TIB-67R

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ATCC® Number: **CCL-26™** Order this Item Price: **$295.00**

Designations:	BS-C-1
Depositors:	HE Hopps
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Cercopithecus aethiops*
Morphology:	epithelial
Source:	**Organ:** kidney **Disease:** normal
Cellular Products:	keratin
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.
Applications:	transfection host (Roche FuGENE® Transfection Reagents) detection of viruses [21447]
Virus Susceptibility:	SV40; poliovirus 1; vesicular stomatitis (Indiana)
Reverse Transcript:	negative
Cytogenetic Analysis:	Chromosome Frequency Distribution 100 Cells: 2n = 60One large submetacentric marker chromosome. Most of the cells contained a chromosome with a secondary constriction and many of the cells contained dicentric chromosomes.
Comments:	The cells are positive for keratin by immunoperoxidase staining. African green monkey kidney cell line suitable for transfection by SV40 vectors.
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.

Subculturing:	**Temperature:** 37.0°C **Protocol:** Remove medium, and rinse with 0.25% trypsin, 0.03% EDTA solution. Remove the solution and add an additional 1 to 2 ml of trypsin-EDTA solution. Allow the flask to sit at room temperature (or at 37C) until the cells detach.Add fresh culture medium, aspirate and dispense into new culture flasks. **Subcultivation Ratio:** A subcultivation ratio of 1:3 to 1:6 is recommended **Medium Renewal:** Two to three times weekly
Preservation:	**Freeze medium:** Complete growth medium, 95%; DMSO, 5% **Storage temperature:** liquid nitrogen vapor temperature
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003 recommended serum:ATCC 30-2020
References:	1820: Hopps, H. E., et al. Biologic characteristics of the continuous kidney cell line derived from the African green monkey. J. Immunol. 91: 416-424, 1963. PubMed: 14071033 21447: American Public Health Association. Compendium of methods for the microbiological examination of foods. 3rd ed.Washington, DC: American Public Health Association; 1992. 32372: Berson JF, et al. A seven-transmembrane domain receptor involved in fusion and entry of T-cell-tropic human immunodeficiency virus tyep 1 strains. J. Virol. 70: 6288-6295, 1996. PubMed: 8709256 32501: Jelachich ML, Lipton HL. Theiler's murine encephalomyelitis virus kills restrictive but not permissive cells by apoptosis. J. Virol. 70: 6856-6861, 1996. PubMed: 8794327 58406: et al., Schmidt NJ. The sensitivity of grivet monkey kidney cell line BS-C-1 for propagation and isolation of certain human viruses. Am. J. Public Health 54: 1522-1530, 1964.

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Cell Biology

ATCC® Number: CCL-81™ Order this Item

Price: $256.00

Designations: Vero

Depositors: W Hann, JS Rhim

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Cercopithecus aethiops*

Morphology: epithelial

PHOTO

Source: **Organ:** kidney
Disease: normal

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.

Isolation: **Isolation date:** March 27, 1962

Applications:
detection of verotoxin [21447]
efficacy testing [92579] [92587]
malaria biology
media testing [11019]
mycoplasma testing [92577]
substrate [92447]
testing [34219] [92309] [92319] [92320] [92321] [92322] [92324] [92346] [92389]
transfection host (Nucleofection technology from Lonza
Roche FuGENE® Transfection Reagents)
detection of virus in ground beef [34219]

Virus Susceptibility: poliovirus 1, 2, 3; Getah; Ndumu; Pixuna; Ross River; Semliki Forest; Paramaribo; Kokobera; Modoc; Murutucu; Germiston; Guaroa; Pongola; Tacaribe; SV-5; SV40; rubeola; rubellavirus; reovirus 1, 2, 3; simian adenoviruses

Virus Resistance: Stratford; Apeu; Caraparu; Madrid; Nepuyo; Ossa

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Reverse Transcript: negative

Cytogenetic Analysis: This is a cell line with the hypodiploid chromosome count. The modal chromosome number was 58 occurring in 66% of cells. In most cells, over 50% of the chromosomes in each cell complement belonged to structurally altered marker chromosomes. Normal A3, A4, B4, and B5 were absent; B2, B3 and B7 were occasionally paired; and B9, C1 and C5 were mostly paired. The rate of cells with higher ploidies was 1.7%. Other chromosomes were mostly present in single copy.

Age: adult

Comments: The Vero cell line was initiated from the kidney of a normal adult African green monkey on March 27, 1962, by Y. Yasumura and Y. Kawakita at the Chiba University in Chiba, Japan. [21447]
The cell line was brought to the Laboratory of Tropical Virology, National Institute of Allergy and Infectious Diseases, National Institutes of Health in the 93rd passage from Chiba University by B. Simizu on June 15, 1964.

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing: **Protocol:**

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin- 0.53 mM EDTA solution to remove all traces of serum that contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes).
   Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37°C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.
6. Incubate cultures at 37°C.

Subcultivation Ratio: A subcultivation ratio of 1:3 to 1:6 is recommended
Medium Renewal: 2 to 3 times per week

Preservation: **Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Related Products: Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003
recommended serum:ATCC 30-2020
derivative:ATCC CRL-1587

References:

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PHAC - 1

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

Date: June 16, 2006

Your file / Votre référence

Our file / Notre référence

Importer address: University of Western Ontario
Faculty of Medicine & Dentistry
Dept. Microbiology & Immunology
London, ON
N6A 5C1

Dear Dr. Mansour Haeryfar,

Enclosed you will find your Public Health Agency of Canada permit to import human pathogen(s), **P-12602, P-12613, P-12675.**

Due to the nature of the material requested for import, some additional conditions apply. Please review and note the conditions of import, in particular conditions #8, #9 and #10. Condition #8 states that "Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements. No culturing of Risk Group 3 pathogens shall be done". Condition #9 states that "No imported material may be removed to another location, or transferred into the possession of a person other than the importer, without the permission of the director [of the Office of Laboratory Security, Public Health Agency of Canada]". Condition #10 states that "The Director [of the Office of Laboratory Security, Public Health Agency of Canada] must approve all new work with the imported material involving construction of recombinants that require an increase of containment from level 2".

If you have any questions or comments regarding this matter, please do not hesitate to contact our office.

Sincerely,

for Paul J. Payette, Ph.D.
Director, Office of Laboratory Security
Centre for Emergency Preparedness and Response
100 Colonnade Road, Loc.: 6201A
Ottawa, Ontario, Canada K1A 0K9
Phone: (613) 957-1779
Fax: (613) 941-0596

Encl.

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permit no.-Permis no.

P-12602

Permit to import human pathogen(s)

Permis d'importation d'agent(s) anthropopathogène(s)

Under the authority of the Human Pathogens Importation Regulations

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

---

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal

University of Western Ontario
Faculty of Medicine & Dentistry, Dept. Microbiology & Immunology
London, ON N6A 5C1 Attn.: Dr. Mansour Haeryfar

Facsimile-Télécopieur: (519) 661-3499

Telephone no.- No. de téléphone: (519) 850-2488

Supplier-Name and address - **Fournisseur**-Nom et adresse

Dr. Jack Bennink or Dr. Bernard Moss, Laboratory of Viral Diseases,
National Institutes of Health (NIH), Room 201, Bldg. 4
9000 Rockville Pike, Bethesda, Maryland, 20892-0440, USA

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Toronto

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Risk Group 2 infectious substances* listed on "Attachment to Human Pathogen(s) Importation Permit **#P-12602**" that accompanies this Permit to Import.

*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation.
* Les agents anthropopathogènes indiqués sur ce permis doivent aussi être accompagnés d'un permis d'importation de l'ACIA.

On the following terms and conditions as marked:-Selon les conditions indiquées:

1.	Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	[ ]	Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
2.	Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	[x]	Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée
3	All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	[x]	Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs.
4.	All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated	[x]	L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés.
5.	Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	[ ]	Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés
6.	No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	[x]	La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7.	On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	[ ]	Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8.	Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements. No culturing of Risk Group 3 pathogens shall be done.	[ ]	On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3. Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise.
9.	NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	[x]	AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10.	The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2	[ ]	Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.

11. **This permit is valid only for:**
Le présent permis n'est valide que pour:

[ ] a) a single entry into Canada or
une seule entrée au Canada ou

[x] b) importations at intervals of
les importations effectuées à intervalles de

during the period beginning on
au cours de la période commençant le
June 16, 2006

and ending on
et se terminant le
June 30, 2007

Authorization-Signature of Director
Autorisation-Signature du Directeur

for Paul J. Payette, Ph.D.

Date June 16, 2006

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that, those laws apply in respect of that material.

Remarque: Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

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

Office of Laboratory Security
Centre for Emergency Preparedness and Response
100 chemin Colonnade Road, Loc.: 6201A
Ottawa, Ontario K1A 0K9
Phone:(613) 957-1779
Fax# : (613) 941-0596

Your file *Votre référence*

Our file *Notre référence*

ATTACHMENT TO HUMAN PATHOGEN(S) IMPORTATION PERMIT # **P- 12602**
In effect from: June 16, 2006 to: June 30, 2007.
Issued to: Dr. Mansour Haeryfar, University of Western Ontario, London, ON.

Fourth Section on Permit to Import, titled "Description of Pathogen(s)" Includes the following Risk Group 2 infectious substances:

Various influenza virus strains:
A/Puerto Rico/8/34 (PR8) *
PB1-F2 deficient PR8 *
PR8.SEQ12 *
A/Hong Kong/68 (H3N2) *
J-1 reassortant of A/Hong Kong/68 *
X31 reassortant of A/Hong Kong/68 *
A/NT/60/68 NT60 strain H3N2 *
E61-13-H17 reassortant of X31 and NT60 *

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*Pathogen(s) indicated on this permit also require a separately accompanying valid CFIA permit for importation.

for Paul J. Payette, Ph.D.
Director, Office of Laboratory Security

June 16, 2006
Date

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permit no.-Permis no.

P-[illegible]

Permit to import human pathogen(s)

Permis d'importation d'agent(s) anthropopathogène(s)

Under the authority of the Human Pathogens Importation Regulations.

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal	Facsimile-Télécopieur	Telephone no.- No. de téléphone
University of Western Ontario Faculty of Medicine & Dentistry, Dept. Microbiology & Immunology London, ON N6A 5C1 Attn.: Dr. Mansour Haeryfar	(519) 661-3499	(519) 850-2488

Supplier-Name and address - **Fournisseur**-Nom et adresse	**Name(s) of Port(s) of Entry**- To Clear Customs at Port(s) of entry **Nom(s) de(s) point(s) d'entrée** -Dédouanement au(x) point(s) d'entrée
Dr. Jack Bennink or Dr. Bernard Moss, Laboratory of Viral Diseases, National Institutes of Health (NIH), Room 201, Bldg. 4 9000 Rockville Pike, Bethesda, Maryland, 20892-0440, USA	Toronto

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Risk Group 2 infectious substances* listed on "Attachment to Human Pathogen(s) Importation Permit **#P-12613**" that accompanies this Permit to Import.

[illegible]

On the following terms and conditions as marked:-Selon les conditions indiquées:

1.	Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	☐ Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
2.	Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	■ Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée.
3.	All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	■ Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs.
4.	All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated.	■ L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés
5.	Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	☐ Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés
6.	No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■ La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7.	On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	■ Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8.	Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements. No culturing of Risk Group 3 pathogens shall be done	☐ On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3. Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise.
9.	NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR	■ AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10.	The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2.	■ Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.

11. **This permit is valid only for:** ☐ a) a single entry into Canada **or**
Le présent permis n'est valide que pour: une seule entrée au Canada ou

■ b) importations at intervals of / les importations effectuées à intervalles de — during the period beginning on / au cours de la période commençant le — June 13, 2008 — and ending on / et se terminant le — June 30, 2007

Authorization-Signature of Director
Autorisation-Signature du Directeur

Miana Hein
for Paul J. Payette, Ph.D.

Date June 13, 2008

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that, those laws apply in respect of that material.

Remarque: Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

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

Office of Laboratory Security
Centre for Emergency Preparedness and Response
100 chemin Colonnade Road, Loc.: 6201A
Ottawa, Ontario K1A 0K9
Phone:(613) 957-1779
Fax# : (613) 941-0596

Your file *Votre référence*

Our file *Notre référence*

ATTACHMENT TO HUMAN PATHOGEN(S) IMPORTATION PERMIT # **P- 12613**
In effect from: June 16, 2006 to: June 30, 2007.
Issued to: Dr. Mansour Haeryfar, University of Western Ontario, London, ON.

Fourth Section on Permit to Import, titled "Description of Pathogen(s)" Includes the following Risk Group 2 infectious substances:

Various Recombinant vaccinia virus strains:

Wild-type Vaccinia virus (Western Reserve strain)*
rVV-vSC8*
rVV-OVA*
rVV-ES SIINFEKL [rVV ES OVA (257-264)]*
rVV-MSIINFEKL*
rVV-mouse CD1.1*
rVV-mCD1.1ΔY322→A*
rVV-mCD1.1Δcyto(del.319-326)*
rVV-human CD23 (FcεRII)*
rVV-mouse CD54 (ICAM-1)*
rVV-LLO (M91-99: GYKDGNEYI)*
rVV-Listeria p60 (M449-457: IYVGNGQMI)*
rVV-CD80 (B7-1)*
rVV-CD86 (B7-2)*
rVV-CD80+CD86 (B7-1&2)*
rVV-EGFP*
rVV-mouse Invariant chain (Ii)*
rVV-ES P815 P1A (35-43)*
rVV-Listeria p60 (M217-225: KYGVSVQDI)*
rVV-ES NP (366-374: ASNENMETM; PR8)*
rVV-ES PA (224-233: SSLENFRAYV; PR8)*
rVV-PA (M224-233; PR8)*
rVV-ES PB1 (703-711: SSYRRPVGI; PR8)*
rVV-PB1(703-711:SSYRRPVGI; PR8)*
rVV-ES NP 147-155: TYQRTRALV; PR8)*
rVV-NP (M147-155)*
rVV-ES HA (M518-526 or MIYSTVASSL; PR8)*
rVV-HA (M518-526 or MIYSTVASSL; PR8)*
rVV-ES PB1 F2 (LSLRNPILV)*
rVV-PB1 F2 (MLSLRNPILV)*
rVV-SV40 T Ag*
rVV-ES SV40 Tag (206-215: SAINNYAQKL)*
rVV-ES SV40 Tag (223-231: CKGVNKEYL)*
rVV-ES SV40 Tag (404-411: VVYDFLKC)*
rVV-ES SV40 Tag (489-497: QGINNLDNL)*
rVV-SV40 Tag (M206-215)*
rVV-PR8 NP (βgal+) SIINFEKL+EGFP)*
rVV-CMV pp65*
rVV-NP (M367-374: MSNENMETM;PR8)*
rVV-SV40Tag(404-411:MVVYDFLKC)*
rVV-SV40 Tag (M223-231)*
KD2SV: SV40-transformed
rVV-human TAP (1&2)*
rVV-Ubiquitin*
rVV-PR8 NP (βgal+)*
rVV-HEL (Hen Egg Lysozyme)*

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*Pathogen(s) indicated on this permit are risk group 2 pathogens and are subject to containment level 2 requirements.

Marianne Haeryfar

for Paul J. Payette, Ph.D.
Director, Office of Laboratory Security

June 16, 2006
Date

Canada

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

Office of Laboratory Security
Centre for Emergency Preparedness and Response
100 chemin Colonnade Road, Loc.: 6201A
Ottawa, Ontario K1A 0K9
Phone:(613) 957-1779
Fax# : (613) 941-0596

Your file *Votre référence*

Our file *Notre référence*

ATTACHMENT TO HUMAN PATHOGEN(S) IMPORTATION PERMIT # **P- 12675**
In effect from: June 16, 2006 to: June 30, 2007.
Issued to: Dr. Mansour Haeryfar, University of Western Ontario, London, ON.

Fourth Section on Permit to Import, titled "Description of Pathogen(s)" Includes the following Risk Group 2 infectious substances:

Various Recombinant vaccinia virus strains:

rVV-ES P815 P1A (35-43)*	rVV-human tumor-associated Ag HER-2/neu (654-662: MKIFGSLAFL)*	rVV-mouse TNFα*
rVV-P815p (MHIYEFPQL)*	rVV-HLA-B27*	
rVV-ES P815p (HIYEFPQL)*	rVV-mouse IFNγ*	
rVV-ES P815 (KYQAVTTTL)*	rVV-mouse p53*	
rVV-P815 (MKYQAVTTTL)*	rVV-FoxP3*	
rVV-human tumor-associated Ag HER-2/neu (M654-662: MKIFGSLAFL)*	rVV-mouse TLR9*	

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*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation.

for Paul J. Payette, Ph.D.
Director, Office of Laboratory Security

June 16, 2006
Date

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permit no.-Permis no.

P-[redacted]

Permit to import human pathogen(s)

Permis d'importation d'agent(s) anthropopathogène(s)

Under the authority of the Human Pathogens Importation Regulations.

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal	Facsimile-Télécopieur	Telephone no.- No. de téléphone
University of Western Ontario Faculty of Medicine & Dentistry, Dept. Microbiology & Immunology London, ON N6A 5C1 Attn.: Dr. Mansour Haeryfar	(519) 661-3499	(519) 850-2488

Supplier-Name and address - **Fournisseur**-Nom et adresse	**Name(s) of Port(s) of Entry**- To Clear Customs at Port(s) of entry **Nom(s) de(s) point(s) d'entrée** -Dédouanement au(x) point(s) d'entrée
Dr. Jack Bennink or Dr. Bernard Moss, Laboratory of Viral Diseases, National Institutes of Health (NIH), Room 201, Bldg. 4 9000 Rockville Pike, Bethesda, Maryland, 20892-0440, USA	Toronto

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Risk Group 2 infectious substances listed on "Attachment to Human Pathogen(s) Importation Permit **#P-12675**" that accompanies this Permit to Import.

[redacted]

On the following terms and conditions as marked:-Selon les conditions indiquées:

1. Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	☐	Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
2. Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material	■	Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée.
3. All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	■	Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs.
4. All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated.	■	L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés.
5. Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	☐	Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés.
6. No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■	La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7. On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	■	Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8. Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements. No culturing of Risk Group 3 pathogens shall be done.	■	On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3. Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise
9. NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■	AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10. The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2.	■	Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.

11. **This permit is valid only for:** ☐ a) a single entry into Canada **or**
Le présent permis n'est valide que pour: une seule entrée au Canada **ou**

■ b) importations at intervals of — during the period beginning on — and ending on
les importations effectuées à intervalles de — au cours de la période commençant le — et se terminant le

June 16, 2006 — June 30, 2007

Authorization-Signature of Director
Autorisation-Signature du Directeur

Diane Haeryfar
for Paul J. Payette, Ph.D.

Date June 16, 2006

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that, those laws apply in respect of that material.

Remarque: Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

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

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Centre for Emergency Preparedness and Response
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Phone:(613) 957-1779
Fax# : (613) 941-0596

Your file *Votre référence*

Our file *Notre référence*

ATTACHMENT TO HUMAN PATHOGEN(S) IMPORTATION PERMIT # **P- 12676**
In effect from: June 16, 2006 to: June 30, 2007.
Issued to: Dr. Mansour Haeryfar, University of Western Ontario, London, ON.

Fourth Section on Permit to Import, titled "Description of Pathogen(s)" Includes the following Risk Group 2 infectious substances:

Various cell lines:

C57SV: SV40-transformed murine fibroblastic cell line *
HEK 293 (293 QBI), HEK 293-K^b
HEK 293-D^b, HEK 293-A2
kxd SV: Mouse SV40 transformed cell line *
Daudi cells
KD2SV: SV40-transformed murine kidney epithelial cell line *
HeLa cells
Raji cells
SS SV: SV40 transformant *
1E12: Mouse TAP 1-mutant T lymphoma cell line (may contain SV40)*

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*Pathogen(s) indicated on this permit also require an accompanying valid PHAC permit for importation.

for Paul J. Payette, Ph.D.
Director, Office of Laboratory Security

June 16, 2006
Date

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permit no.-Permis no.

P-[redacted]

Permit to import human pathogen(s)

Permis d'importation d'agent(s) anthropopathogène(s)

Under the authority of the Human Pathogens Importation Regulations.

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal	Facsimile-Télécopieur	Telephone no.- No. de téléphone
University of Western Ontario Faculty of Medicine & Dentistry, Dept. Microbiology & Immunology London, ON N6A 5C1 Attn.: Dr. Mansour Haeryfar	(519) 661-3499	(519) 850-2488

Supplier-Name and address - **Fournisseur**-Nom et adresse	**Name(s) of Port(s) of Entry**- To Clear Customs at Port(s) of entry **Nom(s) de(s) point(s) d'entrée** -Dédouanement au(x) point(s) d'entrée
Dr. Jack Bennink or Dr. Bernard Moss, Laboratory of Viral Diseases, National Institutes of Health (NIH), Room 201, Bldg. 4 9000 Rockville Pike, Bethesda, Maryland, 20892-0440, USA	Toronto

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Risk Group 2 infectious substances listed on "Attachment to Human Pathogen(s) Importation Permit **#P-12676**" that accompanies this Permit to Import.

[redacted]

On the following terms and conditions as marked:-Selon les conditions indiquées:

1. Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	☐	Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
2. Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	■	Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée.
3. All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	■	Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs
4. All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated.	■	L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés
5. Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	☐	Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés.
6. No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■	La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7. On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	☐	Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8. Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements. No culturing of Risk Group 3 pathogens shall be done.	☐	On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3. Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise.
9. NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	☐	AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10. The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2.	☐	Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.

11. **This permit is valid only for:**
Le présent permis n'est valide que pour:

☐ a) a single entry into Canada **or**
une seule entrée au Canada **ou**

■ b) importations at intervals of / les importations effectuées à intervalles de

during the period beginning on / au cours de la période commençant le June 13, 2006

and ending on / et se terminant le June 30, 2007

Authorization-Signature of Director
Autorisation-Signature du Directeur

Marianne Haeryfar
for Paul J. Payette, Ph.D.

Date June 13, 2006

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that, those laws apply in respect of that material.

Remarque: Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

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

Date issued: June 16, 2006

Name and/or Organization: **University of Western Ontario**
Attn: Dr. Mansour Haeryfar

Your file *Votre référence*

Our file *Notre référence*

Address:
Faculty of Medicine & Dentistry
Dept. Microbiology & Immunology
London, ON
N6A 5C1

The following biological material does not require a Public Health Agency of Canada import permit under the HPIR*:

EL-4, E.G7, RMA, RMA/S, T2, P815, JAWSII, J-774, DC2.4, MC57G, BSC-1, 143B, Vero, LTA-5, A20, L929, L-K^b, L-D^b, 2.4G2 (Fc Block), H28-E23, NA2-8C4, PC61, X63 AG8, UC10-4F10-11, CTLA-4 Ig-24, CHO-CTLA-4 Ig, 25-D1.16, Anti-NK-1.1, PK136, GK1.5 and anti-CD8 mAb, as provided by the National Institute of Health (NIH), Maryland, USA.

for Paul J. Payette, Ph. D.
Director, Office of Laboratory Security

June 16, 2006
Date

NOTICE

***HPIR (HUMAN PATHOGENS IMPORTATION REGULATIONS)**

- We are in receipt of your application for an importation permit for biological materials. The **HPIR** apply **only** to the importation of infectious substances which cause human disease and their subsequent distribution or transfer. Other materials, which are deemed by the importer to be non-infectious for humans, **do not** require a permit under these regulations. It should be noted that the importation of biological materials may also be subject to other federal, provincial and municipal laws.
- For animal or plant pathogens one **must** apply to The Canadian Food Inspection Agency (CFIA) for a permit to import. If this material is of animal or plant origin it may also require a permit from the CFIA. Please contact the CFIA for their consideration. CFIA contact numbers are as follows:
  (613) 221-7068 for information concerning animal pathogens/material
  (613) 225-2342 [ext. 4334] for information concerning plant pathogens/material
- Importation of this material may also be subject to the requirements of the *New Substances Notification Regulations (Organisms)* of the *Canadian Environmental Protection Act, 1999*, administered by Environment Canada and Health Canada. Please contact the New Substances Information Line at 1-800-567-1999 or nsn-infoline@ec.gc.ca.
- You may be required to provide the Canada Border Services Agency (CBSA) customs officers with a declaration that the imported material is non-infectious and non-hazardous.

Should you require further information, please contact:
Office of Laboratory Security
Centre for Emergency Preparedness and Response
(613) 957-1779

Canada

Western

Schulich
MEDICINE & DENTISTRY

Attention: Ms. Paula Esber
Biohazard Containment & Safety Division
Canadian Food Inspection Agency
159 Cleopatra Drive
Nepean, Ontario K1A 0Y9
Tel: 613-221-7074
Fax: 613-228-6129

July 20, 2006

Dear Paula:

RE: Application for permit

This is to inform you that my animal use protocol involving *in vivo* research with influenza viruses has now been approved by our animal care facility at the University of Western Ontario (protocol approval # 2006-065-08). We wish to ask you at this point to kindly switch our permit that you already issued for *in vitro* research (permit # A-2006-01834-4) to *in vivo* use of influenza viruses as we discussed before. As for vaccinia viruses, we have not yet finalized our animal use protocol for working with these viruses, and anticipate that this process may take a few months. Therefore, we will use these viruses in our *in vitro* studies only until we will have all the required biosafety permits and protocols in place, at which point we will contact you again. I would like to thank you very much in advance for your precious time and splendid cooperation.

Sincerely,

Dr. Mansour Haeryfar
Assistant Professor
Dept. of Microbiology & Immunology
Faculty of Medicine and Dentistry
University of Western Ontario
London, Ontario, N6A 5C1
Canada
Tel: (office) (519) 850-2488 or ext. 82488
Tel: (lab) (519) 661-2111 ext. 86624
Fax: (519) 661-3499
e-mail: Mansour.Haeryfar@schulich.uwo.ca
Website : http://publish.uwo.ca/~mhaeryfa/

Office of Laboratory Security
Bureau de la sécurité des laboratoires
Centre for Emergency Preparedness and Response
Centre de mesures et d'interventions d'urgence
100 chemin Colonnade Road, Loc.: 6201A
Ottawa, Ontario, Canada K1A 0K9
Tel: (613) 957-1779 **Fax: (613) 941-0596**

Public Health Agency of Canada / Agence de la santé publique du Canada
WHO Collaborating Centre for Biosafety
Centre collaborateur OMS pour les techniques de biosécurité

TO/À: Dr. Mansour Haeryfar
University of Western Ontario
Department of Microbiology and Immunology

DATE:

FAX: 519 - 661-3499 **TEL:** 519 - 850-2488 **PAGES TO FOLLOW / PAGES À SUIVRE :** 8

* COMMENTS - COMMENTAIRES *

As requested, please find attached a copy of your **permit** to import human pathogen(s). Also enclosed is a copy of *"Human Pathogens Importation Regulations - Instructions to Permit Holders"*. The original permit is being sent to you through regular mail. **If you have not already done so, we would appreciate receiving your original application for a permit to import human pathogen(s) so our files may be kept up to date.**

N.B.: Please check the **"Description of Pathogen(s)"** section of your attached permit, and **IF** the following message has been included: **"*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation."**, then the material is of a **zoonotic** nature and a valid permit from the Canadian Food Inspection Agency (CFIA) is required for this importation in addition to your attached human pathogens import permit. If you do not have a valid permit from the CFIA, please contact them directly for assistance at: **(613) 221-7068**.

Also, importation of this material may be subject to the requirements of the New Substances Notification Regulations (Organisms) administered by Environment Canada and Health Canada. Please contact the New Substances Information Line at 1-800-567-1999 or nsn-infoline@ec.gc.ca.

Thank you for your collaboration

Vous trouverez sous pli une copie de votre **permis** d'importation d'agent(s) anthropopathogène(s), ainsi que les *"Règlements sur l'importation d'agent(s) anthropopathogène(s)-Devoir du détenteur d'un permis"*. La copie originale de votre permis vous parviendra par la poste. **Si ce n'est déjà fait, prière de nous faire parvenir votre demande originale de permis d'importation (d')agent(s) anthropopathogène(s) afin de tenir nos dossiers à jour.**

N.B.: Concernant la section **"Description de(s) agents anthropopathogène(s)"** de votre permis ci-joint, **SI** nous avons ajouté la note suivante: **"*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation."**, ceci signifie qu'il s'agit d'un agent **zoopathogène**. Ainsi il vous faudra aussi un permis valide de l'Agence canadienne d'inspection des aliments (ACIA) pour cette importation. Si vous n'avez pas un permis valide de l'ACIA, veuillez vous adresser directement à eux au: **(613) 221-7068**.

L'importation peut aussi être sujet aux exigences du Règlement sur les renseignements concernant les substances nouvelles gouverné par Environnement Canada et Santé Canada. Pour de plus amples renseignements, appeler la ligne-info au 1-800-567-1999 ou nsn-infoline@ec.gc.ca.

Merci de votre collaboration

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

Your file / Votre référence

Our file / Notre référence

Name and/or Organization: **University of Western Ontario**
Department of Microbiology and Immunology
Attn: Dr. Mansour Haeryfar

Address:

1151 Richmond Street
London, ON
N6A 5C1

The following biological material does not require a Public Health Agency of Canada import permit under the HPIR*:

Mouse hybridoma cell line; PAb 101 (ATCC# TIB-117), as provided by the University of Delaware, Department of Biological Sciences, Wolf Hall, Newark, DE 19716 USA.

for M C Graham

Marianne Heisz
Chief, Importation and Regulatory Affairs

DECEMBER 04, 2008
Date

NOTICE

***HPIR (HUMAN PATHOGENS IMPORTATION REGULATIONS)**

- We are in receipt of your application for an importation permit for biological materials. The **HPIR** apply **only** to the importation of infectious substances which cause human disease and their subsequent distribution or transfer. Other materials, which are deemed by the importer to be non-infectious for humans, **do not** require a permit under these regulations. It should be noted that the importation of biological materials may also be subject to other federal, provincial and municipal laws.
- For animal or plant pathogens one **must** apply to The Canadian Food Inspection Agency (CFIA) for a permit to import. If this material is of animal or plant origin it may also require a permit from the CFIA. Please contact the CFIA for their consideration. CFIA contact numbers are as follows:
  (613) 221-7068 for information concerning animal pathogens/material
  (613) 221-4195 for information concerning plant pathogens/material
- Importation of this material may also be subject to the requirements of the *New Substances Notification Regulations (Organisms)* of the *Canadian Environmental Protection Act, 1999*, administered by Environment Canada and Health Canada. Please contact the New Substances Information Line at 1-800-567-1999 or nsn-infoline@ec.gc.ca.
- You may be required to provide the Canada Border Services Agency (CBSA) customs officers with a declaration that the imported material is non-infectious and non-hazardous.

Should you require further information, please contact:
Office of Laboratory Security
Centre for Emergency Preparedness and Response
(613) 957-1779

Canada

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

Your file / Votre référence

Our file / Notre référence

Name and/or Organization: **University of Western Ontario**
Department of Microbiology and Immunology
Attn: Dr. Mansour Haeryfar

Address:

1151 Richmond Street
London, ON
N6A 5C1

The following biological material does not require a Public Health Agency of Canada import permit under the HPIR*:

Natural Killer T (NKT) hybridoma cell lines; N38-2C12 (N37-2C12), N37-1A12 and N38-3C3 as provided by Fox Chase Cancer Center, 333 Cottman Avenue, Philadelphia, PA 19111-2497 USA.

for

Marianne Heisz
Chief, Importation and Regulatory Affairs

DECEMBER 04, 2008
Date

NOTICE

***HPIR (HUMAN PATHOGENS IMPORTATION REGULATIONS)**

We are in receipt of your application for an importation permit for biological materials. The **HPIR** apply **only** to the importation of infectious substances which cause human disease and their subsequent distribution or transfer. Other materials, which are deemed by the importer to be non-infectious for humans, **do not** require a permit under these regulations. It should be noted that the importation of biological materials may also be subject to other federal, provincial and municipal laws.

For animal or plant pathogens one **must** apply to The Canadian Food Inspection Agency (CFIA) for a permit to import. If this material is of animal or plant origin it may also require a permit from the CFIA. Please contact the CFIA for their consideration. CFIA contact numbers are as follows:

(613) 221-7068 for information concerning animal pathogens/material
(613) 221-4195 for information concerning plant pathogens/material

Importation of this material may also be subject to the requirements of the *New Substances Notification Regulations (Organisms)* of the *Canadian Environmental Protection Act, 1999*, administered by Environment Canada and Health Canada. Please contact the New Substances Information Line at 1-800-567-1999 or nsn-infoline@ec.gc.ca.

You may be required to provide the Canada Border Services Agency (CBSA) customs officers with a declaration that the imported material is non-infectious and non-hazardous

Should you require further information, please contact:

Office of Laboratory Security
Centre for Emergency Preparedness and Response
(613) 957-1779

Canada

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

Your file / Votre référence

Our file / Notre référence

Name and/or Organization: **University of Western Ontario**
Department of Microbiology and Immunology
Attn: Dr. Mansour Haeryfar

Address:

1151 Richmond Street
London, ON
N6A 5C1

The following biological material does not require a Public Health Agency of Canada import permit under the HPIR*:

Mouse hybridoma cell lines; H28-E23, NA2-8C4, X63 AG8, PK 136 (ATCC# HB-191), GK 1.5 (ATCC# TIB-207) and 2.43 (ATCC# TIB-210), as provided by Viral Immunology and Cellular Biology Sections, Laboratory of Viral Disease, NIAID, National Institutes of Health (NIH), 333 North Drive, Bethesda, MD 20892-3209.

for M Heisz

Marianne Heisz
Chief, Importation and Regulatory Affairs

DECEMBER 04, 2008
Date

NOTICE

***HPIR (HUMAN PATHOGENS IMPORTATION REGULATIONS)**

- We are in receipt of your application for an importation permit for biological materials. The **HPIR** apply **only** to the importation of infectious substances which cause human disease and their subsequent distribution or transfer. Other materials, which are deemed by the importer to be non-infectious for humans, **do not** require a permit under these regulations. It should be noted that the importation of biological materials may also be subject to other federal, provincial and municipal laws.
- For animal or plant pathogens one **must** apply to The Canadian Food Inspection Agency (CFIA) for a permit to import. If this material is of animal or plant origin it may also require a permit from the CFIA. Please contact the CFIA for their consideration. CFIA contact numbers are as follows:
  (613) 221-7068 for information concerning animal pathogens/material
  (613) 221-4195 for information concerning plant pathogens/material
- Importation of this material may also be subject to the requirements of the *New Substances Notification Regulations (Organisms)* of the *Canadian Environmental Protection Act, 1999*, administered by Environment Canada and Health Canada. Please contact the New Substances Information Line at 1-800-567-1999 or nsn-infoline@ec.gc.ca
- You may be required to provide the Canada Border Services Agency (CBSA) customs officers with a declaration that the imported material is non-infectious and non-hazardous.

Should you require further information, please contact
Office of Laboratory Security
Centre for Emergency Preparedness and Response
(613) 957-1779

Canada

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

Your file / Votre référence

Our file / Notre référence

Name and/or Organization: **University of Western Ontario**
Department of Microbiology and Immunology
Attn: Dr. Mansour Haeryfar

Address:

1151 Richmond Street
London, ON
N6A 5C1

The following biological material does not require a Public Health Agency of Canada import permit under the HPIR*:

Mouse cell lines; RMA-S mock transfected or with mouse CD1d transfected, as provided by Albert Einstein College of Medicine, Department of Microbiology and Immunology, Forchheimer Building, RM# 416, 1300 Morris Park Avenue, Bronx, NY 10461 USA.

for Marianne Heisz
Chief, Importation and Regulatory Affairs

DECEMBER 04, 2008
Date

NOTICE

***HPIR (HUMAN PATHOGENS IMPORTATION REGULATIONS)**

- We are in receipt of your application for an importation permit for biological materials. The **HPIR** apply **only** to the importation of infectious substances which cause human disease and their subsequent distribution or transfer. Other materials, which are deemed by the importer to be non-infectious for humans, **do not** require a permit under these regulations. It should be noted that the importation of biological materials may also be subject to other federal, provincial and municipal laws.
- For animal or plant pathogens one **must** apply to The Canadian Food Inspection Agency (CFIA) for a permit to import. If this material is of animal or plant origin it may also require a permit from the CFIA. Please contact the CFIA for their consideration. CFIA contact numbers are as follows:
  (613) 221-7068 for information concerning animal pathogens/material
  (613) 221-4195 for information concerning plant pathogens/material
- Importation of this material may also be subject to the requirements of the *New Substances Notification Regulations (Organisms)* of the *Canadian Environmental Protection Act, 1999*, administered by Environment Canada and Health Canada. Please contact the New Substances Information Line at 1-800-567-1999 or nsn-infoline@ec.gc.ca.
- You may be required to provide the Canada Border Services Agency (CBSA) customs officers with a declaration that the imported material is non-infectious and non-hazardous.

Should you require further information, please contact:
Office of Laboratory Security
Centre for Emergency Preparedness and Response
(613) 957-1779

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Permit to import human pathogen(s)

Under the authority of the Human Pathogens Importation Regulations

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permis d'importation d'agent(s) anthropopathogène(s)

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

Permit no -Permis no.

P- 16338

Importer Name, address and postal code - **Importateur** Nom, adresse et code postal

University of Western Ontario
Department of Microbiology and Immunology
1151 Richmond Street,
London, ON N6A 5C1

Attn : Dr. Mansour Haeryfar

Facsimile-Télécopieur: 519 - 661-3499

Telephone no - No de téléphone: 519 - 850-2488

Supplier-Name and address - **Fournisseur**-Nom et adresse

University of Delaware
Department of Biological Sciences,
Wolf Hall,
Newark, DE
USA 19716

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Various ports

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de:

Baculovirus (AcNPV) expressing large Tantigen*.

*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation -
*Les agents anthropopathogènes indiqués sur ce permis doivent aussi être accompagnés d'un permis d'importation de l'ACIA.

On the following terms and conditions as marked:-Selon les conditions indiquées:

1.	Work involving any of the imported material shall be limited to *in vitro* laboratory studies	■ Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*
2.	Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	■ Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée
3	All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities	☐ Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs.
4.	All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated	■ L'équipement, les enclos pour animaux, les cages, les literies, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinération
5	Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated	☐ Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinération.
6	No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■ La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7	On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	☐ Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8.	Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements.	☐ On peut accomplir l'isolation, l'identification primaire et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3.
9	NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR	☐ AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10	The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2	☐ Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demanderont que le niveau 2 de confinement soit augmenté exigera l'approbation du directeur.
11	No culturing of Risk Group 3 or 4 pathogens shall be done	☐ Aucune culture d'agent anthropopathogène du Groupe de risque 3 ou 4 ne sera entreprise

12. **This permit is valid only for:**
Le présent permis n'est valide que pour:

☐ a) a single entry into Canada or
une seule entrée au Canada ou

■ b) importations at intervals of
les importations effectuées à intervalles de

during the period beginning on
au cours de la période commençant le
DECEMBER 0 4, 2008

and ending on
et se terminant le
DECEMBER 1 5, 2009

Authorization Signature of Director
Autorisation-Signature du Directeur

for Marianne Heisz

Date DECEMBER 0 4, 2008

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any) to the extent that those laws apply in respect of that material.

Note : Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Permit to Import human pathogen(s)

Under the authority of the Human Pathogens Importation Regulations

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permis d'importation d'agent(s) anthropopathogène(s)

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

Permit no.-Permis no.

P- 16341

Importer-Name, address and postal code - Importateur-Nom, adresse et code postal

University of Western Ontario
Department of Microbiology and Immunology,
1151 Richmond Street,
London, ON N6A 5C1

Attn : Dr. Mansour Haeryfar

Facsimile-Télécopieur: 519 - 661-3499

Telephone no.- No. de téléphone: 519 - 850-2488

Supplier-Name and address - Fournisseur-Nom et adresse

Albert Einstein College of Medicine
Department of Microbiology and Immunology,
Forchheimer Building, Room # 416,
1300 Morris Park Avenue,
Bronx, NY, USA 10461

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Various ports

Description of Pathogen(s)-For the importation of- Description de(s) agent(s) anthropopathogène(s)-Pour l'importation de

Human lymphoblastoid cell line: C1R transfected with CD1d.

On the following terms and conditions as marked:-Selon les conditions indiquées:

1.	Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	■ Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*
2.	Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	■ Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée
3.	All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	□ Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'épreuve des insectes et des rongeurs.
4.	All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incineration.	■ L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés.
5.	Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	□ Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés.
6.	No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR	■ La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR
7.	On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	□ Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8.	Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements.	□ On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3.
9.	NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR	□ AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10.	The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2	□ Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur
11.	No culturing of Risk Group 3 or 4 pathogens shall be done	□ Aucune culture d'agent anthropopathogène du Groupe de risque 3 ou 4 ne sera entreprise.

12. This permit is valid only for:
Le présent permis n'est valide que pour:

□ a) a single entry into Canada or
une seule entrée au Canada ou

■ b) importations at intervals of
les importations effectuées à intervalles de

during the period beginning on
au cours de la période commençant le
DECEMBER 0 4, 2008

and ending on
et se terminant le
DECEMBER 1 5, 2009

Authorization-Signature of Director
Autorisation-Signature du Directeur

for Marianne Heisz

Date DECEMBER 0 4, 2008

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that those laws apply in respect of that material.

Note : Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

Public Health Agency of Canada
Centre for Emergency Preparedness and Response

Permit to import human pathogen(s)

Under the authority of the Human Pathogens Importation Regulations

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permis d'importation d'agent(s) anthropopathogène(s)

Sous le régime du Règlement sur l'importation des agents anthropopathogènes

Permit no./Permis no.

P- 16340

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal

University of Western Ontario
Department of Microbiology and Immunology
1151 Richmond Street,
London, ON N6A 5C1
Attn : Dr. Mansour Haeryfar

Facsimile Télécopieur: 519 - 661-3499

Telephone no./ No. de téléphone: 519 - 850-2488

Supplier-Name and address - **Fournisseur**-Nom et adresse

University of Chigago
Department of Pathology,
929 East 57th Street,
Gordon Center for Integrative Sciences W506,
Chigago, IL, USA 60637

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Various ports

Description of Pathogen(s)-For the importation of **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Mouse fibroblastic cell lines; C57SV mock transfected or mouse CD1d transfected".

"Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation -
"Les agents anthropopathogènes indiqués sur ce permis doivent aussi être accompagnés d'un permis d'importation de l'ACIA.

On the following terms and conditions as marked:-Selon les conditions indiquées:

1. Work involving any of the imported material shall be limited to *in vitro* laboratory studies.

☐ Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.

2. Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material

■ Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée.

3. All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities

■ Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs

4. All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated

■ L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viendront en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés

5. Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.

☐ Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés

6. No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR

■ La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D UNE AUTRE PERSONNE QUE L'IMPORTATEUR.

7. On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed

☐ Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.

8. Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements

☐ On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles du niveau de confinement 3.

9. NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR

☐ AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR

10. The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2

☐ Tous nouveaux travaux de manipulation génétique (recombins) avec la matière importée qui demanderont que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.

11. No culturing of Risk Group 3 or 4 pathogens shall be done

☐ Aucune culture d'agent anthropopathogène du Groupe de risque 3 ou 4 ne sera entreprise.

12. **This permit is valid only for:**
Le présent permis n'est valide que pour:

☐ a) a single entry into Canada **or**
une seule entrée au Canada ou

■ b) importations at intervals of
les importations effectuées à intervalles de

during the period beginning on
ou cours de la période commençant le
DECEMBER 0 4, 2008

and ending on
et se terminant le
DECEMBER 1 5, 2009

Authorization Signature of Director
Autorization-Signature du Directeur

Marianne Heisz

Date DECEMBER 0 4, 2008

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that those laws apply in respect of that material.

Nota : Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

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

✻ IMPORTANT NOTICE ✻

Your file *Votre référence*

Our file *Notre référence*

1) **ZOONOTIC IMPORTS:** Please check the **"Description of Pathogen(s)"** section of your attached permit, and if the following message (in red print) has been included: " ***Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation.**", then the material is of a **zoonotic** nature and a valid permit from the Canadian Food Inspection Agency (CFIA) is required for this importation in addition to your attached human pathogens import permit. If you do not have a valid permit from the Canadian Food Inspectin Agency, please contact Ms. Nicole Latreille for assistance at: **(613) 221-7068**.

2) INSTRUCTIONS FOR USE OF YOUR PERMIT:

[as per the *Human Pathogen(s) Importation Regulations (SOR/94-558)*]

Prior to shipment of the human pathogen described in the Import Permit the importer **must**:

a) provide a copy of the importation permit to the supplier and notify the supplier that **a copy of the importation permit must be attached to each shipment**;

b) **notify the supplier** that the outer shipping container in which the human pathogen is transported must display clearly, on the outside surface of the container, the importation permit number and the following statement immediately preceeding that number:

"Human Pathogen – Importation Permit Number:/Agent anthropopathogène – Numéro du permis d'importation:"

If the permit holder who arranges to import a human pathogen that belongs to Risk Group 3 or 4, does not receive the human pathogen on, or within three (3) days after, such date of receipt as may reasonably be expected in the circumstances, he shall forthwith give to the Director, Office of Laboratory Security a notice that the human pathogen has not been received and provide the Director with the importation permit number.

To facilitate Customs clearance, a copy of the importation permit should be kept by the importer and presented to Customs or sent to the importer's customs broker.

Direct inquiries to:

Office of Laboratory Security
Public Health Agency Canada
Centre for Emergency Preparedness and Response
100 Colonnade Road, Loc.: 6201A
Ottawa, Ontario K1A 0K9

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

Canada