THE UNIVERSITY OF WESTERN ONTARIO
BIOLOGICAL AGENTS REGISTRY FORM
Approved Biohazards Subcommittee: October 14, 2010
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 (UWO) or in charge of a laboratory/facility where the use of Level 1, 2 or 3 biological agents is described in the laboratory or animal work proposed. The form must also be completed if any work is proposed involving animals carrying zoonotic agents infectious to humans or involving plants, fungi, or insects that require Public Health Agency of Canada (PHAC) or Canadian Food Inspection Agency (CFIA) permits.

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

Containment Levels will be established in accordance with Laboratory Biosafety Guidelines, 3rd edition, 2004, Public Health Agency of Canada (PHAC) or Containment Standards for Veterinary Facilities, 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 Biohazards 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	Nathalie Berube
DEPARTMENT	Paediatrics and Biochemistry
ADDRESS	800 Commissioners Road East
PHONE NUMBER	519-685-8500x55066
EMERGENCY PHONE NUMBER(S)	
EMAIL	nberube@uwo.ca

Location of experimental work to be carried out: Building(s) ___LRCP/VRL_____ Room(s)_A4-116(lab), A4-142(office)_____

*For work being performed at Institutions affiliated with the University of Western Ontario, the Safety Officer for the Institution where experiments will take place must sign the form prior to its being sent to the University of Western Ontario Biosafety Officer (See Section 15.0, Approvals).

FUNDING AGENCY/AGENCIES:____CIHR, International Rett Syndrome Foundation (IRSF)_____
GRANT TITLE(S):
CIHR : Neuronal functions of the ATRX mental retardation gene
CIHR: Control of skeletal development by the chromatin remodeling protein ATRX
IRSF: Epigenetic regulation of gene expression by MeCP2 in the mouse brain

List all personnel working under Principal Investigators supervision in this location:

Name	UWO E-mail Address	Date of Biosafety Training
Ashley Watson	Lwatso6@uwo.ca	04/2009
Kristian Levey	klevey@uwo.ca	11/2010
Xu Wang	Xwang287@uwo.ca	01/2011
Kristin Kernoham	kkernoha@uwo.ca	04/2011
Yan Jiang	Jiangy02@yahoo.com	04/2011
Mike Levey	Mlevy2@uwo.ca	04/2011
Kieran Ritchie	kritchie@uwo.ca	10/2005

Jennifer Li	Rli55@uwo.ca	/2006
Lauren Solomon	Lsolomo2@uwo.ca	10/2010
Jason Bush	bush@ualberta.ca	04/2011

Please explain the biological agents and/or biohazardous substances used and how they will be stored, used and disposed of. Projects without this description will not be reviewed.

Disposal of bioharzardous materials

The experimental approach that is described above utilizes, or generates, biohazards that fit into the following categories:

Bacterial cell cultures that harbor foreign DNA:
All solid phase media and culture vessels are sealed in biohazardous waste containers for autoclaving. All liquid cultures are bleached, neutralized, and disposed of down the drain.

Mammalian cell culture (primary and immortal cell isolates):
All tissue culture plastics are sealed in biohazardous waste containers for autoclaving. All liquid waste is bleached, neutralized, and disposed of down the drain

Viral production:
All tissue culture plastics are collected in biohazardous waste bags inside the laminar flow hood, sealed and autoclaved after removal from the hood. All glassware is disinfected with bleach inside the laminar flow hood and neutralized before removal from hood. All liquid waste is bleached and neutralized inside the hood before removal.

Extraction of DNA from mammalian tissues:
All extractions are carried out in a laminar flow hood. We use an agent from Qiagen Extraction Kit that dissolves the tissue and allows the DNA to be isolated. Its harsh chemical make up destroys any associated pathogens that may be present. Dissolved tissue is disposed of in biohazardous waste containers for autoclaving. The DNA is further purified and sterilized in alcohol and stored.

Please include a one page research summary or teaching protocol.

1. The roles of the ATRX chromatin remodeling protein in mouse brain development. We are investigating the outcome of ATRX loss of function using the Cre/loxP system in the mouse. Using various mouse Cre driver lines, we have inactivated ATRX in early neurogenesis and are determining the effects on cell division and differentiation, gene expression profiles, higher order chromatin looping, and the epigenetic state of chromatin in the developing brain. In some experiments, we will use adenovirus-cre recombinase (Ad-Cre) to inactivate ATRX in cultured mouse embryonic fibroblasts obtained from ATRX floxed mice. Cells will also be infected with a control adenovirus-Green Fluorescent Protein (Ad-GFP). Both of these adenoviral vectors are non-oncogenic and non-growth promoting. The infected cells will not be injected in animals. (Funded by CIHR)

2. The roles of the ATRX chromatin remodeling protein in mouse skeletal development. In collaboration with Dr. Frank Beier at UWO, we are using various Cre driver lines to inactivate ATRX in early limb bud mesenchyme, cartilage or osteoblasts. We are investigating the outcome of ATRX loss of function using histological, cellular and molecular techniques. (Funded by CIHR)

3. Epigenetic regulation of neuronal genes by the chromatin proteins ATRX and MeCP2. Using mouse models that lack either ATRX or MeCP2 in the brain, we are identifying genes that are bound and co-regulated by both these proteins and that may contribute to the related human syndromes, ATR-X and Rett syndrome. (Funded by IRSF)

4. Higher order chromatin looping and insulator functions during brain development. The CTCF insulator protein is a crucial factor in maintaining higher order structure of chromatin. We aim to identify CTCF-binding sites that are specific to brain tissue and to determine the importance of CTCF through conditional inactivation of the gene in the mouse brain.

Acronyms used:
ATRX: alpha-thalassemia mental retardation, X-linked
Cre: Cre recombinase
Floxed: indicates that loxP sites have been introduced in the genome
MeCP2: Methyl-CpG- binding protein 2
CTCF: CCCTC binding factor
CIHR: Canadian Institutes for Health Research
IRSF: International Rett Syndrome foundation.

1.0 Microorganisms

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

Do you use microorganisms that require a permit from the CFIA? O YES x NO
If YES, please give the name of the species. _____
What is the origin of the microorganism(s)? _____
Please describe the risk (if any) of escape and how this will be mitigated:

_____
_____
_____

Please attach the CFIA permit.
Please describe any CFIA permit conditions:

_____
_____
_____

1.2 Please complete the table below:

Name of Biological Agent(s)* (Be specific)	Is it known to be a human pathogen? YES/NO	Is it known to be an animal pathogen? YES/NO	Is it known to be a zoonotic agent? YES/NO	Maximum quantity to be cultured at one time? (in Litres)	Source/ Supplier	PHAC or CFIA Containment Level
E.coli DH5α One shot Top10 completant cells	O Yes x No	O Yes x No	O Yes x No	0.15 L 0.1L	Invitrogen	x 1 O 2 O 2+ O 3
E.coli DH10β	O Yes x No	O Yes x No	O Yes x No	1L	TCAG Genome Resource Facility	x 1 O 2 O 2+ O 3
adenovirus	O Yes x No	O Yes x No	O Yes x No	0.1L	Other investigators	x 1 O 2 O 2+ O 3
Retroviruses	O Yes x No	O Yes x No	O Yes x No	0.1L	Oligoengine	x 1 O 2 O 2+ O 3

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

Containment Level?

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	AUS Protocol Number
Human	O Yes x No		Not applicable
Rodent	x Yes O No	Telencephalon tissue from embryonic mice Mouse embryonic fibroblasts (obtained from E12-E13 embryos)	2008-041-02

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)*	Containment Level of each cell line	Supplier / Source of cell line(s)
Human	x Yes O No	Hela, MCF-7, C33A,U2OS SH-SY5Y, Phoenix-Eco	Level (2)	ATCC, other investigators
Rodent	x Yes O No	Neuro2A	Level (2)	ATCC, other investigators
Non-human primate	O Yes x No			
Other (specify)	O Yes x No			

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

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

3.0 Use of Human Source Materials

3.1 Does your work involve the use of human source materials? O YES x NO
If no, please proceed to Section 4.0

3.2 Indicate in the table below the Human Source Material to be used.

Human Source Material	**Source/Supplier /Company Name**	**Is Human Source Material Infected With An Infectious Agent? YES/UNKNOWN**	**Name of Infectious Agent (If applicable)**	**PHAC or CFIA Containment Level (Select one)**
Human Blood (whole) or other Body Fluid		O Yes O Unknown		O 1 O 2 O 2+ O 3
Human Blood (fraction) or other Body Fluid		O Yes O Unknown		O 1 O 2 O 2+ O 3
Human Organs or Tissues (unpreserved)		O Yes O Unknown		O 1 O 2 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 from transformation or tranfection
E.Coli DH5a	*See accompanying table of plasmids*	*See accompanying table of plasmids*	*Too numerous to list, in general related to chromatin function and development*	*.None in bacteria.*

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

4.3 Will genetic modification(s) of bacteria and/or cells involving viral vectors be made?
X YES, complete table below O NO

Virus Used for Vector Construction	Vector(s) *	Source of Vector	Gene(s) Transduced	Describe the change that results from transduction
None	*Recombinant adenovirus* *Retroviral vector*	*Other investigators* Oligoengine	*GFP* *Cre recombinase* *Short hairpin RNAs(shRNA)*	*Experiments not performed yet.* *Adenovirus containing cre will be used to delete gene sequences containing LoxP sites in floxed MEFs. Ad-GFP is used as a control. shRNA used for depletion of ATRX or control genes in trasfected cell*

* 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 O YES x 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, please specify _____ x NO

4.5 Will virus be replication defective? x YES O NO

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

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

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? O YES x NO If no, please proceed to section 7.0

6.2 Name of animal species to be used_____

6.3 AUS protocol # _____

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

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

_____

_____

7.0 Use of Animal species with Zoonotic Hazards

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

7.2 Will live animals be used? O YES O No

7.3 If yes, please specify the animal(s) used:

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

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

_____

8.0 Biological Toxins

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

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

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

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

8.5 How much of the toxin is stored*? _____

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

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

9.0 Insects

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

_____

_____

10.0 Plants

10.1 Do you use plants? 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
If YES, Please attach the CFIA permit & describe any CFIA permit conditions:

_____

_____

11.0 Import Requirements

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

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

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

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

12.0 Training Requirements for Personnel Named on Form

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

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

♦ Employee Health and Safety Orientation

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

SIGNATURE _____

13.0 Containment Levels

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

13.2 Has the facility been certified by OHS for this level of containment?
x YES, date of most recent biosafety inspection: Dec. 10, 2010 Marie Ryder
O NO, please certify
O NOT REQUIRED for Level 1 containment

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

14.0 Procedures to be Followed

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

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

__We don't inject any of the agents listed above. The greatest risk for people in my lab is contact with these agents on their skin. The best remedy is thorough washing of the affected areas. None of the listed agents offers a serious health risk from skin exposure. Even adenoviruses don't infect through the epidermis (they need mucosal membranes)

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

SIGNATURE _____ Date: May 25, 2011

15.0 Approvals

1) UWO Biohazards Subcommittee: SIGNATURE: _____
Date: _____

2) Safety Officer for the University of Western Ontario
SIGNATURE:_____
Date:_____

3) Safety Officer for Institution where experiments will take place (if not UWO):
SIGNATURE: Marie Ryder
Date: MAY 27, 2011

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

Special Conditions of Approval:

5—1

MSDS'

Office of Laboratory Security

MSDS

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

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

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

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

SECTION II - HEALTH HAZARD

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

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

HOST RANGE: Humans

INFECTIOUS DOSE: >150 plaque forming units when given intranasally

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

INCUBATION PERIOD: From 1-10 days

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

SECTION III - DISSEMINATION

RESERVOIR: Humans

ZOONOSIS: None

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: No specific antiviral available; cidofovir has shown

promise in the treatment of adenoviral ocular infections.

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

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

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

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm by serological analysis

FIRST AID/TREATMENT: Mainly supportive therapy

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

PROPHYLAXIS: None available

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: Ten cases documented up to 1988

SOURCES/SPECIMENS: Respiratory secretions

PRIMARY HAZARDS: Ingestion; droplet exposure of the mucous membrane

SPECIAL HAZARDS: Contact with feces from infected animals

SECTION VII - RECOMMENDED PRECAUTIONS

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

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

OTHER PRECAUTIONS: None

SECTION VIII - HANDLING INFORMATION

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

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

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: November 1999

Prepared by: Office of Laboratory Security, PHAC

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

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[Material Safety Data Sheets - Index]

Last Updated: 2001-01-23 Important Notices

invitrogen™

Material Safety Data Sheet

Revision Date: 28-Aug-2007

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

Product code 440098
Product name SUBCLONING EFFICIENCY DH5A COMPETENT CELLS

Company/Undertaking Identification

INVITROGEN CORPORATON
1600 FARADAY AVENUE
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

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous/Non-hazardous Components

Chemical Name	CAS-No	Weight %
Glycerol	56-81-5	7-13
dimethylsulfoxide	67-68-5	3-7

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

3. HAZARDS IDENTIFICATION

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

Form
Liquid

3. HAZARDS IDENTIFICATION

Principle Routes of Exposure/
Potential Health effects

Eyes	Mild eye irritation.
Skin	moderate skin irritation. Components of the product may be absorbed into the body through the skin.
Inhalation	No information available
Ingestion	May be harmful if swallowed.

Specific effects

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

Target Organ Effects — No information available

HMIS

Health	1
Flammability	0
Reactivity	0

4. FIRST AID MEASURES

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

5. FIRE-FIGHTING MEASURES

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

6. ACCIDENTAL RELEASE MEASURES

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

7. HANDLING AND STORAGE

Handling	No special handling advice required
Storage	Keep in properly labelled containers

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls

Exposure limits

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	-
dimethylsulfoxide	-	-	-	-

Engineering measures Ensure adequate ventilation, especially in confined areas

Personal protective equipment

Respiratory protection In case of insufficient ventilation wear suitable respiratory equipment.
Hand protection Impervious butyl rubber gloves. Nitrile gloves are not recomended. Some brands of Nitrile gloves have breakthrough times of five minutes. .
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	soluble	

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Chemical Name	LD50 (oral,rat/mouse)	LD50 (dermal,rat/rabbit)	LC50 (inhalation,rat/mouse)
Glycerol	12600 mg/kg (Rat)	10 g/kg (Rabbit)	570 mg/m³ (Rat)
dimethylsulfoxide	14500 mg/kg (Rat)	No data available	No data available

Principle Routes of Exposure/ Potential Health effects

Eyes Mild eye irritation.
Skin moderate skin irritation. Components of the product may be absorbed into the body through the skin.
Inhalation No information available
Ingestion May be harmful if swallowed.

Specific effects

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

Target Organ Effects — No information available

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

IATA

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

15. REGULATORY INFORMATION

International Inventories

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

U.S. Federal Regulations

SARA 313
This product is not regulated by SARA.

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

U.S. State Regulations

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

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

WHMIS hazard class:
Non-controlled

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

16. OTHER INFORMATION

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

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

End of Safety Data Sheet

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

Product code 500257
Product name TOP 10 - ONE SHOT

Contact manufacturer
INVITROGEN CORPORATON
1600 FARADAY AVENUE
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

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous/Non-hazardous Components
The product contains no substances which at their given concentration, are considered to be hazardous to health

3. HAZARDS IDENTIFICATION

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

Form
suspension

Principle Routes of Exposure/ Potential Health effects

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

Specific effects

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

Sensitization	No information available
Target Organ Effects	No information available

4. FIRST AID MEASURES

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

5. FIRE-FIGHTING MEASURES

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Use personal protective equipment
Methods for cleaning up	Soak up with inert absorbent material

7. HANDLING AND STORAGE

Handling	No special handling advice required
Storage	Keep in properly labelled containers

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls

Exposure limits

Engineering measures Ensure adequate ventilation, especially in confined areas

Personal protective equipment

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

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Form suspension

Important Health Safety and Environmental Information

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

Water solubility	No data available

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Principle Routes of Exposure/ Potential Health effects

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

Specific effects

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

Target Organ Effects	No information available

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

IATA

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

15. REGULATORY INFORMATION

International Inventories

U.S. Federal Regulations

SARA 313
Not regulated

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product contains the following HAPs:

U.S. State Regulations

California Proposition 65
This product contains the following Proposition 65 chemicals:

WHMIS hazard class:
Non-controlled

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

16. OTHER INFORMATION

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End of Safety Data Sheet

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

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

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

October 20th, 2009

Ms. Shamila Survery / Mr. Michael Decosimo
Cedarlane Laboratories Ltd
4410 Paletta Court
Burlington, Ontario L7L 5R2

By Facsimile: (289) 288-0020

SUBJECT: Importation of *Escherichia coli* strains

Dear Ms. Survery / Mr. Decosimo:

Our office received your query about the importation of *Escherichia coli* from the American Type Culture Collection (ATCC) located in Manassas, Virginia, United States. The following *Escherichia coli* strains are consider to be level 1 animal pathogens:

- 5K
- 58
- 58-161
- 679
- 1532
- AB284
- AB311
- AB1157
- AB1206
- AG1
- B
- BB4
- BD792
- BL21
- BL21 (DE3)
- BM25.8
- C
- C-1a
- C-3000
- C25
- C41 (DE3)
- C43 (DE3)
- C600
- Cavalli Hfr
- CIE85
- DH1
- DH10 GOLD
- DH10B
- DH5
- DH5 alpha
- DP50
- DY145
- DY380
- E11
- EJ183
- EL250
- EMG2
- EPI 300
- EZ10
- FDA Seattle 1946
- Fusion-Blue
- H1443
- HF4714
- HB101
- HS(PFAMP)R
- Hfr3000
- Hfr3000 X74
- HMS174
- J52
- J53
- JC3272
- JC7661
- JC9387
- JF1504
- JF1508
- JF1509
- JJ055
- JM83
- JM101
- JM109
- K12
- KC8
- KA802
- KAM32
- KAM33
- KAM43
- LE450
- LE451
- LE452
- MB408
- MBX1928
- MC1061
- MC4100 (MuLac)
- MG1655
- MM294
- MS101
- NC-7
- Nissle 1917
- One Shot STBL3
- OP50
- P678
- PA309
- PK-5
- PMC103
- PR13
- Rri
- RV308
- S17-1λ -PIR
- SCS1
- SMR10
- SOLR
- SuperchargeEZ10
- SURE
- TOP10
- TG1
- U5/41
- W208
- W945
- W1485
- W3104
- W3110
- WA704
- WP2
- X1854
- X2160T
- X2541
- X2547T
- XL1-BLUE
- XL1-BLUE-MRF
- XLOLR
- Y10
- Y1090 (1090)
- YN2980
- W3110
- WG1
- WG439
- WG443
- WG445

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

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

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

Sincerely,

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

Canada

VECTOR BIOLABS
THE ADENOVIRUS COMPANY

MATERIAL SAFETY DATA SHEET

EMERGENCY TELEPHONES: 1-877-Biolabs 1-215-966-6045
http://www.vectorbiolabs.com

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

PRODUCT IDENTIFICATION:
All pre-made adenovirus made by Vector BioLabs.

BIOLOGICAL NAME: Adenovirus - Type 5
CHARACTERISTICS: Adenoviridae; non-enveloped, icosahedral virions, 75-80 nm diameter, doubledstranded, linear DNA genome. The recombinant viruses are based on human adenoviral backbone which is deleted in the essential E1 gene as well as the E3 gene. The viruses produced are thus non-replicative.

SECTION II - HEALTH HAZARD

PATHOGENICITY: Varies in clinical manifestation and severity; symptoms include fever, rhinitis, pharyngitis, cough and conjunctivitis. The risk from infection by defective recombinant adenoviral vectors depends both on the dose of virus and on the nature of the transgene. Adenovirus does not integrate into the host cell genome but can produce a strong immune response.
HOST RANGE: Humans and animals
INCUBATION PERIOD: from 1-10 days
MODE OF TRANSMISSION: In the laboratory, care must be taken to avoid spread of infectious material by aerosol, direct contact or accidental injection
CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN: None

SECTION III - VIABILITY

DRUG SUSCEPTIBILITY: No specific antiviral available
SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde. Recommend use of 1/3 volume of bleach for 30 minutes.
PHYSICAL INACTIVATION: Sensitive to heat; 1 hour at 56°C is used to inactivate virus.
SURVIVAL OUTSIDE HOST: Adenovirus type 5 survived from 3-8 weeks on environmental surfaces at room temperature.

SECTION IV - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm by serological analysis
FIRST AID/TREATMENT:
Contact: Immediately flush eyes and skin with plenty of water for at least 15 minutes. Call a physician.
Inhalation: N/A
Ingestion: Wash out mouth with water. Call a physician
Accidental injection: wash area with soap and water. Call a physician.

SECTION V – ACCIDENTAL RELEASE PROCEDURES

Pour 1 volume of Javel water over the leak(s) and wait for 15 minutes.
Wipe up carefully.
Hold for autoclave waste disposal and decontaminate work surfaces with 70% alcohol.

SECTION VI - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices and containment facilities for all activities involving the virus and potentially infectious body fluids or tissues. This level consists of etiological agents considered to be of ordinary potential harm.
PROTECTIVE CLOTHING: Recombinants Adenovirus: Laboratory coat; gloves.

OTHER PRECAUTIONS:
Access to the laboratory is limited.
Work surfaces are decontaminated before and after each procedure
Mechanical pipetting devices are used for all procedures; mouth pipetting is prohibited.
Eating, drinking, and smoking are not permitted in the laboratory; food is not stored in laboratory areas.
Laboratory coats are worn in and are removed before leaving the laboratory.
Hands are washed before and after handling virus.

SECTION VII - HANDLING INFORMATION

DISPOSAL: Decontaminate all wastes before disposal; steam sterilization
STORAGE: In sealed containers that are appropriately labeled

SECTION VIII - MISCELLANEOUS INFORMATION

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

Date of revision: May 24, 2004

3701 Market Street, Suite 340, Philadelphia, PA 19104 Tel: 877-biolabs Fax: 215-966-6001 info@vectorbiolabs.com

Cell line(s)

Cell Biology

ATCC® Number:	CRM-HTB-31™ Order this Item	Price:	$400.00

Designations:	C-33 A
Depositors:	N Auersperg
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
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:	For use in testing and calibration in ISO 17025 accredited laboratories, to challenge assay performance, validate or compare test methods, and to establish sensitivity, linearity and specificity during assay validation or implementation. ISO Guide 34:2000<\a.
Tumorigenic:	YES
Oncogene:	p53 +; pRB +
DNA Profile (STR):	Amelogenin: X CSF1PO: 12 D13S317: 13 D16S539: 13,14 D5S818: 11,12 D7S820: 10 THO1: 7,8 TPOX: 9 vWA: 18,20
Cytogenetic Analysis:	This a pseudodiploid human cell line with the modal chromosome number of 46, occurring in 70% of cells examined. Polyploid cells occurred at 8.6%. Seven marker chromosomes were consistently detected per pseudodiploid cell. They are: t(1q17q), t(1p21q), del(18) (q21.3), der(1)t(1;17) (p16;q21.3) and three others. Several other markers were also found but they occurred only once in 15 metaphases analyzed. Neither DMs nor HSRs were detected. Structurally normal N1 was absent. Generally there are two X chromosomes in each cell.
Isoenzymes:	AK-1, 1 ES-D, 1
Age:	66 years adult

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BioServices

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BioStandards

Biological Reference Material and Consensus Standards for the life science community

Cell Biology

ATCC® Number:	HTB-96™ [Order this Item]	Price:	$256.00

Designations:	U-2 OS
Depositors:	Hellstrom
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
Source:	**Organ:** bone **Disease:** osteosarcoma
Cellular Products:	osteosacoma derived growth factor (ODGF)
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)
Receptors:	insulin-like growth factor I (IGF-I); insulin-like growth factor II (IGF II)
Antigen Expression:	Blood Type A; Rh+; HLA A2, Aw30, B12, Bw35, B40(+/-)
DNA Profile (STR):	Amelogenin: X CSF1PO: 13 D13S317: 13 D16S539: 11,12 D5S818: 11 D7S820: 11,12 THO1: 6,9.3 TPOX: 11,12 vWA: 14,18
Cytogenetic Analysis:	Cell line U-2 OS is chromosomally highly altered, with chromosome counts in the hypertriploid range. We did not find the hypodiploid cell population described by J. Ponten, et al., Instead, most of the population has slightly higher counts than first described. Very few normal chromosomes are present, but a high number of stable marker chromosomes are identified., Different chromosomal rearrangements involving the same chromosomes (N1, N7, N9, and N11 particularly), are seen. Twenty-two markers are found including: t(9qter---->9q21::1p36--->1p::?), 7p+, iso(17q), t(15q;?), 4q+, del(3)(q21), 5q(aberrant) and others. [22509]

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ATCC | THE ESSENTIALS OF LIFE SCIENCE RESEARCH

ATCC Advanced Catalog Search » **Product Details**

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.

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Cell Biology

ATCC® Number: HTB-22™ Order this Item

Price: $279.00

Designations:	MCF7
Depositors:	CM McGrath
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
Source:	**Organ:** mammary gland; breast **Disease:** adenocarcinoma **Derived from metastatic site:** pleural effusion **Cell Type:** epithelial
Cellular Products:	insulin-like growth factor binding proteins (IGFBP) BP-2; BP-4; BP-5
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)
Receptors:	estrogen receptor, expressed
Antigen Expression:	Blood Type O; Rh+
DNA Profile (STR):	Amelogenin: X CSF1PO: 10 D13S317: 11 D16S539: 11,12 D5S818: 11,12 D7S820: 8,9 THO1: 6 TPOX: 9,12 vWA: 14,15
Cytogenetic Analysis:	modal number = 82; range = 66 to 87. The stemline chromosome numbers ranged from hypertriploidy to hypotetraploidy, with the 2S component occurring at 1%. There were 29 to 34 marker chromosomes per S metaphase; 24 to 28 markers occurred in at least 30% of cells, and generally one large submetacentric (M1) and 3 large subtelocentric (M2, M3, and M4) markers were recognizable in over 80% of metaphases. No DM were detected. Chromosome 20 was nullisomic and X was disomic.
Isoenzymes:	AK-1, 1 ES-D, 1-2 G6PD, B GLO-I, 1-2 PGM1, 1-2 PGM3, 1
Age:	69 years adult
Gender:	female
Ethnicity:	Caucasian
Comments:	The MCF7 line retains several characteristics of differentiated mammary epithelium including ability to process estradiol via cytoplasmic estrogen receptors and the capability of forming domes.The cells express the WNT7B oncogene [PubMed: 8168088]. Growth of MCF7 cells is inhibited by tumor necrosis factor alpha (TNF alpha). Secretion of IGFBP's can be modulated by treatment with anti-estrogens.

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ATCC® Number: CRL-2266™ Order this Item

Price: $279.00

Designations: SH-SY5Y

Depositors: JL Biedler

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: mixed, adherent and suspension

Organism: *Homo sapiens* (human)

Morphology: epithelial

Source:
Organ: brain
Disease: neuroblastoma
Derived from metastatic site: bone marrow

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: NOTE: SH-SY5Y was deposited at the ATCC by June L. Biedler, Memorial Sloan-Kettering Cancer Center. SH-SY5Y is distributed for academic research purposes only. Memorial Sloan-Kettering releases the line subject to the following: 1.) SH-SY5Y or its 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 SH-SY5Y including any use by a for-profit entity must first be negotiated with Director, Office of Industrial Affairs, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021; phone (212) 639-6181; FAX (212) 717-3439.

Isolation: **Isolation date:** 1970

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

Antigen Expression: Blood Type A; Rh+

DNA Profile (STR):
Amelogenin: X
CSF1PO: 11
D13S317: 11
D16S539: 8,13
D5S818: 12
D7S820: 7,10
THO1: 7,10
TPOX: 8,11
vWA: 14,18

Cytogenetic Analysis: modal number = 47; the cells possess a unique marker comprised of a chromosome 1 with a complex insertion of an additional copy of a 1q segment into the long arm, resulting in trisomy of 1q [22554]

Age: 4 years

Gender: female

Comments: SH-SY5Y cells have a reported saturation density greater than 1 X 10(6) cells/sq cm. They are reported to exhibit moderate levels of dopamine beta hydroxylase activity [PubMed ID: 29704].

Propagation: **ATCC complete growth medium:** The base medium for this cell line is a 1:1 mixture of ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003, and F12 Medium. 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

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Cell Biology

ATCC® Number: CCL-131™ Order this Item

Price: $279.00

Designations: Neuro-2a

Depositors: RJ Klebe

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: adherent

Organism: *Mus musculus* (mouse)

Morphology: neuronal and amoeboid stem cells

Source:
Strain: A
Organ: brain
Disease: neuroblastoma
Cell Type: neuroblast;

Cellular Products: acetylcholinesterase
tubulin

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)

Virus Susceptibility: Herpes simplex virus
Vesicular stomatitis virus
Human poliovirus 1

Antigen Expression: H-2, a haplotype; Mus musculus, expressed

Cytogenetic Analysis: modal number = 95; range = 59 to 193.
Karyotype unstable within a stemline range of 94 to 98 chromosomes. All the cells contain 6 to 10 large chromosomes with median or submedian centromeres and 2 to 4 minute chromosomes.

GenoType: albino

Comments: Clone Neuro-2a was established by R.J. Klebe and F.H. Ruddle from a spontaneous tumor of a strain A albino mouse. This tumor line, designated C1300, was obtained from the Jackson Laboratory, Bar Harbor, Maine [22161].Neuro-2a cells produce large quantities of microtubular protein which is believed to play a role in a contractile system which is responsible for axoplasmic flow in nerve cells.The cell line has been used for studies on the mechanism of vinblastine precipitation of microtubular protein, the kinetics of GTP binding to isolated protein, the turnover of microtubules in vivo, and the synthesis and assembly of microtubular protein [PubMed: 5283744]. The World Organization for Animal Health (OIE) uses the cells for routine diagnosis of rabies. (see: http://www.oie.int/Eng/Normes/Mmanual/A_00044.htm)Tested and found negative for ectromelia virus (mousepox).

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

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Product Information Sheet

orbigen

Phoenix™ Eco Cells (Murine)

PRODUCT SUMMARY

Cat. No:	RVC-10002
Quantity:	1 vial of 10^6 Phoenix™ Eco Cells
Storage:	Store in liquid nitrogen.
Stability:	See Protocol for proper procedure in cells handling.

DESCRIPTION

Phoenix™ Eco packaging cell lines was created by placing constructs which is capable of producing gag-pol and envelope protein for amphotropic viruses into 293T cells.. This cell line offeres the great advantages over previous stable systems in that virus can be produced in just a few days. Orbigen's Phoenix™ Eco cells have been extensively tested for helper virus production and established as being helper-virus free.

Gag-pol was introduced with hygromycin as the co-selectable marker.The envelope proteins were introduced with diptheria toxin resistance as the co-selectable marker. An IRES-CD8 surface marker was also introduced downstream of the reading frame of the gag-pol construct to monitor gag-pol production which can be readily monitored by flow cytometry.

Eotropic packaging cells system is to deliver genes to dividing cells of murine or rat.

PROTOCOLS:

Thawing Phoenix™ Eco Cells:

1. Remove the vial containing frozen cells from liquid nitrogen or shipping box. Thaw rapidly at 37°C by holding the vial and gently shaking in the water bath. Take out the vial from the water bath when the frozen cells start to thaw (about 1-2 minutes). The key point is NOT to let the cells thaw completely.
2. Immediately add 1 ml of Growth Medium (High glucose DMEM containing 10% heat inactivated fetal bovine serum, 100 U/ml Penicillin, 100 U/ml Streptomycin, 2 mM L-Glutamine) to the cells and gently transfer them to a 15 ml sterile conical screw cap tube.
3. Add 2 ml of GM and gently mix the cells to allow osmotic equilibration.
4. Add 10 ml of GM, close the tube, invert the tube several times and spin cells at 500 x g for five minutes.
5. Remove the supernatant, resuspend cell pellet in GM, and transfer cells to a 10 cm tissue culture dish.

Note: It is important to freeze multiple vials of each producer cell line after first receiving and expanding them to ensure a ready supply of backup vials to allow for uniform virus production over several years. If the cells are to be carried in selective media, this should not be applied until after the first passage.

Growth and passage of Phoenix™ Eco cells:

Phoenix™ Eco cells derived from 293 cells are carried in GM and grown in a 37°C incubator supplied with 5% CO_2. To split and passage the cell lines:

1. Gently rinse cultured cells 1x with PBS (without Ca++ or Mg++).
2. Trypsinize (.05% trypsin/0.53 mM EDTA) until the cells easily detach and can be readily pipetted into a single cell suspension.
3. Trypsinization is quenched with GM prior to subculture in fresh medium.

Note: Do not split the cells at densities more dilute than 1:5 in order to maintain the uniformity of the cells in culture and minimize the outgrowth of clonal variants. The cells should not be allowed to grow over-confluent. This leads to the formation of cell clumps in culture which can cause uneven cell distribution after replating and result in less efficient transfection.

Passaging Phoenix™ Eco cells:

To achieve optimal cell conditions, passage cells at 1:4 or 1:5 at 70-80% confluent every 2-3 days. Never let cells reach confluence since this will reduce transfection efficiency in the short term. Passage of Phoenix™ Eco cells every few months in Hygromycin (300 µg/ml) and Diptheria Toxin (1µg/ml) containing medium for one week is recommended.

Cells can be analyzed and sorted by fluorescent activated cell scan (FACS) for expression of mouse CD8 (a proxy measure of gag-pol in this cell line) and for surface expression of envelope protein with 83A25 antibody.

***Special Note:*

This product is only available for non-profit organization researches. Industrial customers will need to obtain a license agreement with Stanford University prior ordering this product from Orbigen.

Cell Biology

ATCC® Number:	CCL-2™	Order this Item	Price:	$279.00

Designations:	HeLa
Depositors:	WF Scherer
Biosafety Level:	2 [Cells contain human papilloma virus]
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial 
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
DNA Profile (STR):	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

Related Links

NCBI Entrez Search

Cell Micrograph

Make a Deposit

Frequently Asked Questions

Material Transfer Agreement

Technical Support

Related Cell Culture Products

Login Required

Product Information Sheet

BioProducts

Cell, microbial and molecular genomics products for the life sciences

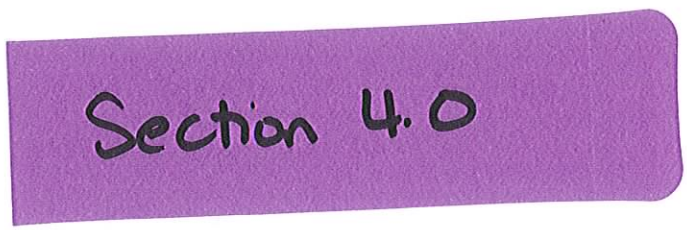
BioServices

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

BioStandards

Biological Reference Material and Consensus Standards for the life science community

Plasmid	Source	Gene Transfected	Describe Change that Resulted
pMAL-C2	NEB	hATRX	Protein Expression Vector
psCODON	Delphi Genetics	mSMC3	Protein Expression Vector
psCODON	Delphi Genetics	mSMC3	Protein Expression Vector
psCODON	Delphi Genetics	mSMC3	Protein Expression Vector
pET30a	Novagen	mSMC3	Protein Expression Vector
pET30a	Novagen	mSMC1A	Protein Expression Vector
psCODON	Delphi Genetics	mSMC1A	Protein Expression Vector
psCODON	Delphi Genetics	mSMC1A	Protein Expression Vector
pET30a	Novagen	mSMC1A	Protein Expression Vector
pET30a	Novagen	mSTAG2	Protein Expression Vector
pET30a	Novagen	mSTAG2	Protein Expression Vector
pMAL-C2	NEB	mMecP2	Protein Expression Vector
pET30a	Novagen	mRad21	Protein Expression Vector
pMAL-C2	NEB	mRad21	Protein Expression Vector
pMAL-C2	NEB	mSororin	Protein Expression Vector
pMAL-C2	NEB	mWAPL	Protein Expression Vector
pMAL-C2	NEB	mWAPL	Protein Expression Vector
pET30a	Novagen	mWAPL	Protein Expression Vector
psCODON	Delphi Genetics	mCTCF	Protein Expression Vector
pcDNA3.1	Invitrogen	Histon3.3, GFP	Protein Expression Vector
pGEM-T	Promega		Amplify methylation DNA
pSUPER RNAi System	Oligoengine	ATRX Si3	Amplify SiRNA
pSUPER RNAi System	Oligoengine	ATRX Si4	Amplify SiRNA



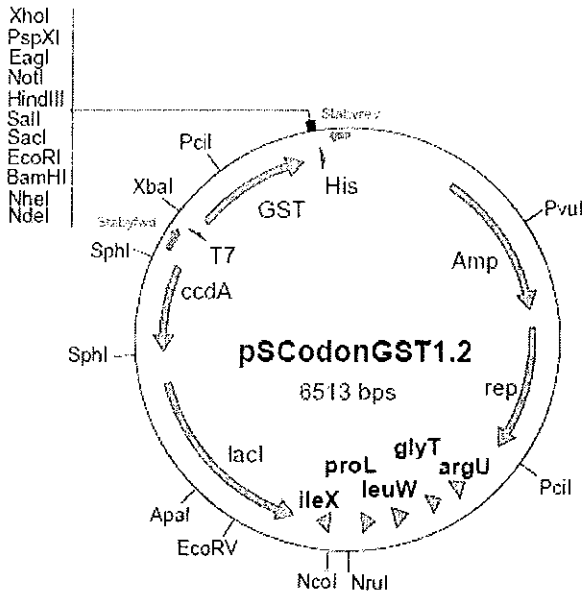


Figure 3: Restriction map of the pSCodonGST1.2 vector

Features:
-Staby forward primer: 5474-5492
-T7 promoter: 5514-5530
-GST: 5603-6256
-His: 6357-6374
-Staby reverse primer: 6417-6399(C)

The complete sequence of the vector is available on our website (www.delphigenerics.com)

pET-30a-c(+) Vectors

TB095 12/98

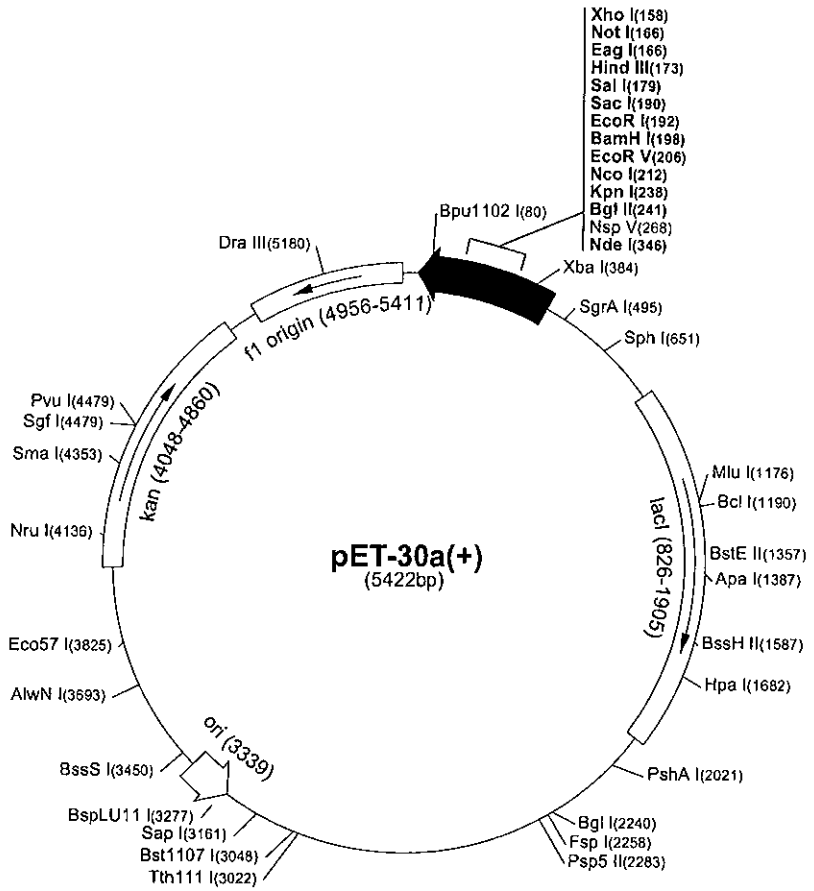
	Cat. No.
pET-30a DNA	69909-3
pET-30b DNA	69910-3
pET-30c DNA	69911-3

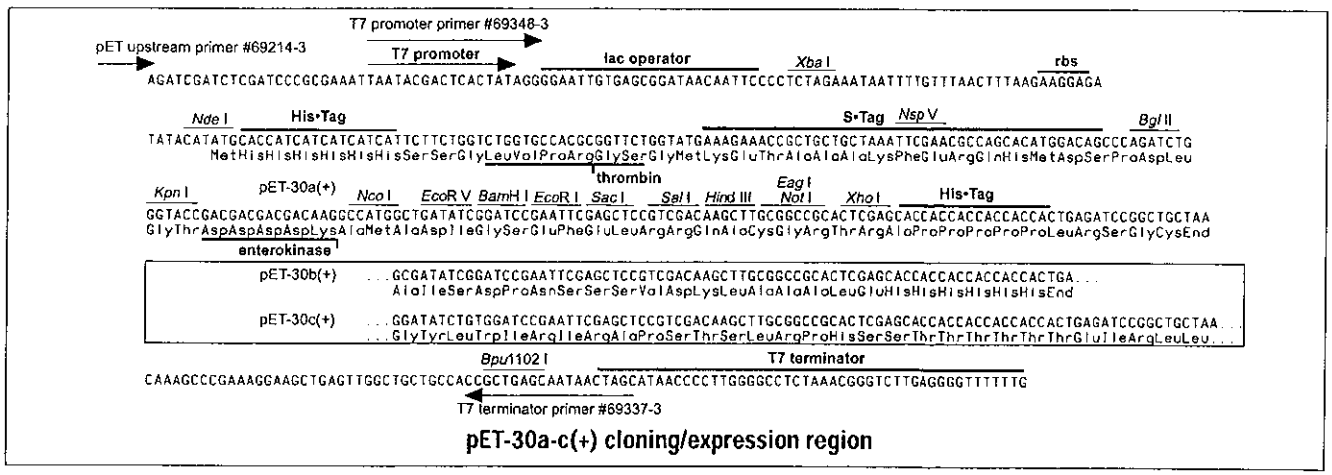
The pET-30a-c(+) vectors carry an N-terminal His• Tag®/thrombin/S• Tag™/enterokinase configuration plus an optional C-terminal His• Tag sequence. Unique sites are shown on the circle map. Note that the sequence is numbered by the pBR322 convention, so the T7 expression region is reversed on the circular map. The cloning/expression region of the coding strand transcribed by T7 RNA polymerase is shown below. The f1 origin is oriented so that infection with helper phage will produce virions containing single-stranded DNA that corresponds to the coding strand. Therefore, single-stranded sequencing should be performed using the T7 terminator primer (Cat. No. 69337-3).

pET-30a(+) sequence landmarks

T7 promoter	419-435
T7 transcription start	418
His• Tag coding sequence	327-344
S• Tag coding sequence	249-293
Multiple cloning sites (*Nco* I - *Xho* I)	158-217
His• Tag coding sequence	140-157
T7 terminator	26-72
lacI coding sequence	826-1905
pBR322 origin	3339
Kan coding sequence	4048-4860
f1 origin	4956-5411

The maps for pET-30b(+) and pET-30c(+) are the same as pET-30a(+) (shown) with the following exceptions: pET-30b(+) is a 5421bp plasmid; subtract 1bp from each site beyond *Bam*H I at 198. pET-30c(+) is a 5423bp plasmid; add 1bp to each site beyond *Bam*H I at 198.





pET-30a-c(+) cloning/expression region

pET-30a(+) Restriction Sites

TB095 12/98

Enzyme	# Sites	Locations				
AccI	2	180	3047			
AceIII	7	943	1671	2002	2786	2927
		3229	5020			
AciI	75					
AflIII	2	1176	3277			
AluI	22					
AlwI	13					
Alw21I	7	159	190	676	1160	2271
		3095	3595			
Alw44I	3	1156	3091	3591		
AlwNI	1	3693				
ApaI	1	1387				
ApaBI	1	860				
ApoI	7	192	270	1451	4092	4276
		4982	4993			
AvaI	2	158	4351			
AvaII	5	1728	2104	2192	2283	2562
BamHI	1	198				
BanI	10	234	310	498	519	633
		1096	1815	1945	2071	5217
BanII	6	190	560	574	1387	4134
		5255				
BbsI	4	1322	1661	2035	2395	
BbvI	25					
BccI	14					
Bce83I	6	21	1990	2160	3368	3666
		3907				
BcefI	6	695	1036	1663	3779	4798
		5206				
BcgI	8	160	194	1468	1502	2002
		2036	2854	2888		
BclI	1	1190				
BfaI	6	70	385	2291	3772	4079
		5331				
BglI	1	2240				
BglII	1	241				
BmgI	1	1385				
BpmI	4	1014	1503	2137	2804	
Bpu10I	2	2383	4496			
Bpu1102I	1	80				
BsaAI	2	3029	5180			
BsaBI	3	449	459	2474		
BsaHI	5	499	520	634	1133	1816
BsaJI	10	57	212	613	619	1811
		2249	3437	4350	4351	4752
BsaWI	7	2	1495	1998	2466	3483
		3630	4614			
BsaXI	2	1835	5128			
BsbI	2	2993	5087			
BscGI	11					
BsgI	3	1027	1227	2437		
BsiI	1	3450				
BsiEI	5	169	1961	3193	3617	4479
BsII	26					
BsmI	2	4363	4440			
BsmAI	6	873	1278	1404	1791	2918
		4495				
BsmBI	3	1791	2918	4495		
BsmFI	4	637	2178	2548	5395	
BsoFI	43					
Bsp24I	10	466	498	1017	1049	1319
		1351	3770	3802	3948	3980
Bsp1286I	12					
BspEI	2	2	2466			
BspGI	1	2803				
BspLU11I	1	3277				
BsrI	21					
BsrBI	4	405	3210	4878	5324	
BsrDI	2	1223	1589			
BsrFI	7	486	495	862	2074	2234
		4433	5281			
BssHII	1	1587				

Enzyme	# Sites	Locations				
Bst1107I	1	3048				
BstEII	1	1357				
BstXI	3	978	1107	1230		
BstYI	9	132	198	241	740	1952
		2469	3918	3929	4728	
Cac8I	40					
CjeI	24					
CjePI	18					
ClaI	2	453	4170			
CviJI	85					
CviRI	31					
DdeI	11					
DpnI	23					
DraIII	1	5180				
DrdI	3	2970	3385	5135		
DrdII	2	899	5185			
DsaI	3	212	613	2249		
EaeI	4	166	484	616	1850	
EagI	1	166				
EarI	3	794	3161	4292		
EciI	3	953	3351	3497		
Eco47III	3	581	2082	2531		
Eco57I	1	3825				
EcoNI	2	711	4391			
EcoO109I	3	53	609	2283		
EcoRI	1	192				
EcoRII	9	899	1214	1754	1811	3303
		3424	3437	4367	4724	
EcoRV	1	206				
FauI	17					
FokI	9	1222	1231	2496	2558	2636
		2822	2963	4117	4723	
FspI	1	2258				
GdiII	4	166	484	616	1850	
HaeI	7	217	904	2225	3292	3303
		3755	4566			
HaeII	14					
HaeIII	24					
HgaI	11					
HgiEII	2	774	3863			
HhaI	46					
Hin4I	4	203	1075	4165	4707	
HincII	2	181	1682			
HindIII	1	173				
HinfI	18					
HpaI	1	1682				
HphI	16					
KpnI	1	238				
MaeI	14					
MaeIII	16					
MboII	13					
MluI	1	1176				
MmeI	7	3492	3676	4121	4315	4677
		4686	5157			
MnlI	25					
MseI	25					
MslI	6	1228	1516	1546	2264	2459
		2850				
MspI	29					
MspA1I	9	84	283	1206	1776	1869
		2868	2987	3619	3864	
MwoI	39					
NarI	4	499	520	634	1816	
NciI	12					
NcoI	1	212				
NdeI	1	346				
NgoAIV	4	486	2074	2234	5281	
NlaIII	26					
NlaIV	23					
NotI	1	166				
NruI	1	4136				
NsiI	2	4329	4595			

Enzyme	# Sites	Locations				
NspI	4	651	2622	2914	3281	
NspV	1	268				
Pfl1108I	1	2063				
PflMI	3	260	758	4742		
PleI	9	433	725	812	1608	3171
		3656	4711	5115	5123	
PshAI	1	2021				
Psp5II	1	2283				
Psp1406I	4	838	2206	2602	4965	
PvuI	1	4479				
PvuII	3	1776	1869	2868		
RcaI	3	574	3997	4872		
RsaI	4	236	1323	3083	4314	
SacI	1	190				
SalI	1	179				
SapI	1	3161				
Sau96I	14					
Sau3AI	23					
ScrFI	21					
SfaNI	23					
SfcI	4	418	3542	3733	5399	
SgfI	1	4479				
SgrAI	1	495				
SmaI	1	4353				
SphI	1	651				
SspI	2	4404	4972			
StyI	2	57	212			
TaqI	17					
TaqII	6	1084	1302	1975	3179	4733
		5084				
TfiI	9	1855	2157	2327	2831	3252
		4390	4446	4618	4709	
ThaI	36					
TseI	25					
Tsp45I	7	1357	2185	2716	2929	3024
		4626	5353			
Tsp509I	21					
Tth111I	1	3022				
Tth111II	8	1015	1708	2738	3867	3874
		3906	4315	4442		
UbaJI	18					
VspI	5	433	1861	1920	4678	4867
XbaI	1	384				
XcmI	3	1032	1548	1566		
XhoI	1	158				
XmnI	2	2835	4868			

Enzymes that do not cut pET-30a(+):

AatII	AflII	AgeI	AscI	AvrII
BaeI	BsaI	BseRI	BspMI	BsrGI
Bsu36I	DraI	Eam1105I	FseI	MscI
MunI	NheI	PacI	PmeI	PmlI
PstI	RleAI	RsrII	SacII	ScaI
SexAI	SfiI	SnaBI	SpeI	SrfI
Sse8387I	StuI	SunI	SwaI	

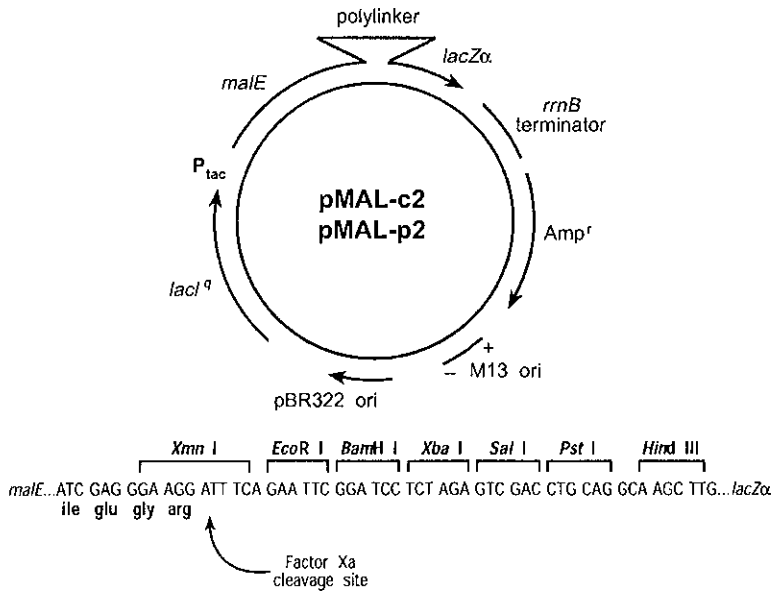


Figure 1. pMAL™-2 Vectors. pMAL™-c2 (6646 base pairs) has an exact deletion of the *malE* signal sequence. pMAL™-p2 (6721 base pairs) includes the *malE* signal sequence. Arrows indicate the direction of transcription. Unique restriction sites are indicated.

MATERIAL SAFETY DATA SHEET

Section 1. Identification

Product Name: PLASMID DNA
Chemical Name: Deoxyribonucleic Acid
CAS Number:
Substance: deoxyribonucleic acid

Other Names or Code Numbers: N/A

Section 2. Composition / Information on Ingredients Section 4. First Aid Measures

Components	% Optional	OSHA PEL	ACGIH TLV	OTHER STANDARDS
PLASMID DNA	None	None	None	None

Section 3. Hazards Identification

General Statement: PLASMID is a nucleic acid prepared from normal human tissue culture cells.

Carcinogen Status: OSHA: No NTP: No IARC: No

Carcinogen Statement: No carcinogenicity data for PLASMID DNA are available in animals or humans.

Mutagenic Effects: No data available.

Teratogenic Effects: No data available.

Reproductive Effects: No data available.

Neurotoxic Effects: No data available.

Section 4. First Aid Measures

If Inhaled: Remove to fresh air. Get medical attention. If breathing has stopped, give artificial respiration. Treat symptomatically and supportively.

If Swallowed: Wash out with water.

In Case of Skin or Eye Contact: No data available. May cause irritation; flush with copious amounts of freely flowing running water. If irritation persists, seek medical care.

Skin Absorption: Limited available data indicates that Plasmid DNA is not absorbed across intact skin.

If Injected: No data available

MATERIAL SAFETY DATA SHEET

Medical Conditions Aggravated by Exposure: No data available.

Section 5. Fire Fighting Measures

Flash Point: No data available
Flammable Limits: n/a
Extinguishing Media: Use water spray, CO2, ABC dry chemical or foam.
Special Fire Fighting Materials: No special procedures.
Unusual Fire and Explosion Hazards: No data available.

Section 6. Accidental Release Measures

Plasmid DNA is not a hazardous material as defined by the U.S. EPA. No data available. Wear gloves to clean up a spill. No other special procedures should be necessary.

Section 7. Handling and Storage

No special safety precautions are required. For product quality assurance, vials must be stored in a 2 - 8 °C (36 - 46 °F) refrigerator. Should refrigeration be unavailable, Plasmid DNA can be stored at 25 °C (77 ° F) for a period of up to 30 days. DO NOT EXPOSE TO HIGH TEMPERATURES.

Section 8. Exposure Control / Personal Protection

Wear gloves, lab coat, and safety glasses to prevent skin and eye contact.

Section 9. Physical and Chemical Properties

Molecular Formula: Deoxyribonucleic acid
Molecular Weight: Varies
Appearance/Odor: white/tan fibers
Solubilities: Soluble in water
Boiling Point: Not determined
Melting Point: Not determined
Vapor Pressure (mm HG): N/A
Vapor Density (Air = 1): N/A
Specific Gravity (H(2)0 = 1): N/A
pH: See data sheet

Section 10. Stability and Reactivity

Plasmid DNA is Stable
Hazardous Polymerization: Will Not Occur
Incompatible Materials: No data available
Conditions to Avoid: No special safety precautions required.
Hazard Decomposition Products: No data available.

MATERIAL SAFETY DATA SHEET

Section 11. Toxicology Information

THE CHEMICAL, PHYSICAL AND TOXICOLOGICAL PROPERTIES OF PLASMID DNA HAVE NOT BEEN THOROUGHLY INVESTIGATED.

Refer to Section 3.

Section 12. Ecological Information

No data available. Plasmid DNA is not a regulated hazardous material.

Section 13. Disposal Considerations

Plasmid DNA is not a regulated hazardous material. Follow federal, state and local environmental regulations for disposal of prescription drugs.

Section 14. Transport Information

DOT Proper Shipping Name: n/a
Hazard Class: n/a
ID #: n/a

Section 15. Regulatory Information

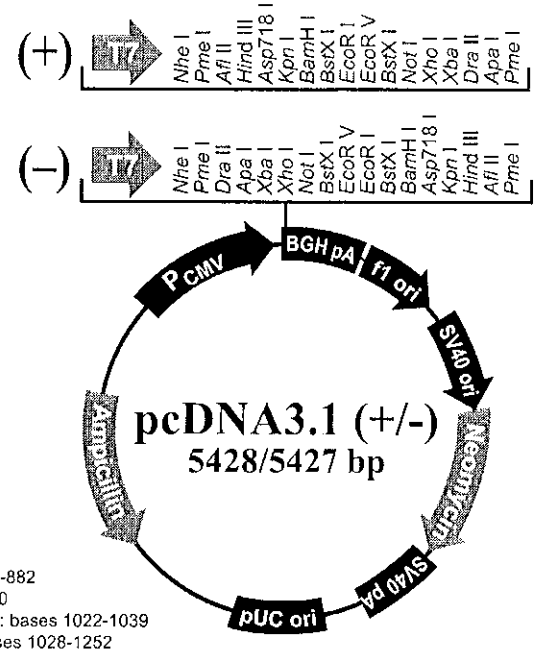
MSDS Created: November 22, 2006
Revised: July 16, 2008
Prepared By: Richard G. Smith
Quality Assurance

DISCLAIMER: The above mentioned data are based on Lofstrand's best present knowledge of this product. Lofstrand cannot guarantee completeness or accuracy of the information contained herein, and disclaims all liability for incompleteness or inaccuracy of the information and for any claims of damages arising from handling or use of this product.

Appendix
pcDNA™3.1 Vectors

Map

The figure below summarizes the features of the pcDNA™3.1(+) and pcDNA™3.1(–) vectors. **The complete sequences for pcDNA™3.1(+) and pcDNA™3.1(–) are available for down-loading from our World Wide Web site (www.invitrogen.com) or from Technical Support (see page 13).** Details of the multiple cloning sites are shown on page 3 for pcDNA™3.1(+) and page 4 for pcDNA™3.1(–).



Comments for pcDNA3.1 (+)
5428 nucleotides

CMV promoter: bases 232-819
T7 promoter/priming site: bases 863-882
Multiple cloning site: bases 895-1010
pcDNA3.1/BGH reverse priming site: bases 1022-1039
BGH polyadenylation sequence: bases 1028-1252
f1 origin: bases 1298-1726
SV40 early promoter and origin: bases 1731-2074
Neomycin resistance gene (ORF): bases 2136-2930
SV40 early polyadenylation signal: bases 3104-3234
pUC origin: bases 3617-4287 (complementary strand)
Ampicillin resistance gene (*bla*): bases 4432-5428 (complementary strand)
ORF: bases 4432-5292 (complementary strand)
Ribosome binding site: bases 5300-5304 (complementary strand)
bla promoter (P3): bases 5327-5333 (complementary strand)

continued on next page

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

Product code 350492
Product name pcDNA3.1/CAT

Company/Undertaking Identification

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

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

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

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

For research use only

2. COMPOSITION/INFORMATION ON INGREDIENTS

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

3. HAZARDS IDENTIFICATION

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

3. HAZARDS IDENTIFICATION

Form
Liquid

Principle Routes of Exposure/ Potential Health effects

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

Specific effects

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

Target Organ Effects No information available

HMIS

Health	0
Flammability	0
Reactivity	0

4. FIRST AID MEASURES

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

5. FIRE-FIGHTING MEASURES

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

6. ACCIDENTAL RELEASE MEASURES

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

7. HANDLING AND STORAGE

Handling	No special handling advice required
Storage	Keep in properly labelled containers

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls

Exposure limits

Engineering measures Ensure adequate ventilation, especially in confined areas

Personal protective equipment

Respiratory Protection In case of insufficient ventilation wear suitable respiratory equipment

Hand protection Protective gloves
Eye protection Safety glasses with side-shields
Skin and body protection Lightweight protective clothing.
Hygiene measures Handle in accordance with good industrial hygiene and safety practice
Environmental exposure controls Prevent product from entering drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Form Liquid

Important Health Safety and Environmental Information

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Principle Routes of Exposure/ Potential Health effects

Eyes No information available
Skin No information available
Inhalation No information available

Ingestion	May be harmful if swallowed.

Specific effects **(Long Term Effects)**

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

Target Organ Effects No information available

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

IATA

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

15. REGULATORY INFORMATION

International Inventories

U.S. Federal Regulations

SARA 313
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

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

WHMIS hazard class:
Non-controlled

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

16. OTHER INFORMATION

For research use only

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

End of Safety Data Sheet

Promega

pGEM®-T Easy Vector Systems

The pGEM®-T Easy Vector Systems are convenient systems for the cloning of PCR products. They offer all of the advantages of the pGEM®-T Vector Systems with the a convenience of recognition sites for EcoRI and NotI flanking the insertion site. Thus several options for removal of the desired insert DNA with a single restriction digestio The pGEM®-T Easy Vector System II contains JM109 Competent Cells in addition to all of the pGEM®-T Easy Vector System I components.

More »

Products **Specifications** **Figures & Tables** **Product Resources**

Figures

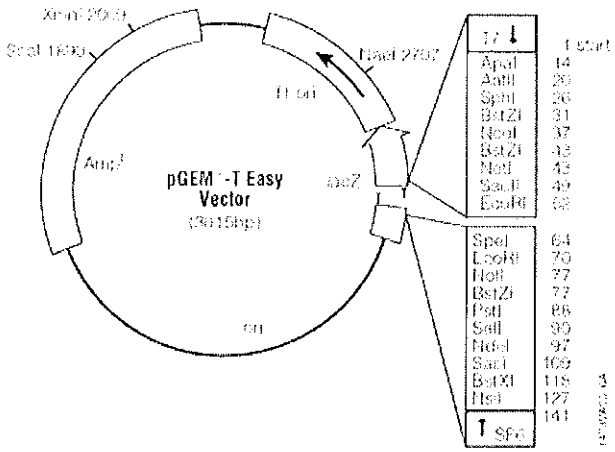


Figure 1. pGEM®-T Easy Vector.

Material Safety Data Sheet
acc. to ISO/DIS 11014

Printing date 03/08/2011 Reviewed on 03/08/2011

*
1 Identification of the substance/mixture and of the company/undertaking

Product identifier

Trade name: pGEM®-T Easy

Article number: A137
Application of the substance / the preparation Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:

Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: MSDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency ONLY (spill, leak, fire, exposure or accident), call CHEMTREC at 1-800-424-9300
For call originating outside the United States dial 001-703-527-3887

2 Composition/information on ingredients

Chemical characterization: Mixtures
Description: Mixture of the substances listed below with nonhazardous additions.

Dangerous components: Void
Additional information: For the wording of the listed risk phrases refer to section 15.

*
3 Hazards identification

Classification of the substance or mixture

Classification according to Directive 67/548/EEC or Directive 1999/45/EC
Not applicable. Product has been classified as non-hazardous.
Information concerning particular hazards for human and environment:
The product does not have to be labelled due to the calculation procedure of international guidelines.
Classification system:
The classification was made according to the latest editions of international substances lists, and is expanded upon by company and technical literature data.

Label elements

Labelling according to EU guidelines:
Observe the general safety regulations when handling chemicals.
The product is not subject to identification regulations according to directives on hazardous materials.

(Contd. on page 2)

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Trade name: pGEM®-T Easy

(Contd. of page 1)

Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0
OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Target Organ(s): Not applicable or unknown

*
4 First aid measures

General information: No special measures required.
After inhalation: Supply fresh air; consult doctor in case of complaints.
After skin contact: Generally the product does not irritate the skin.
After eye contact: Rinse opened eye for several minutes under running water.
After swallowing: If symptoms persist consult doctor.

*
5 Firefighting measures

Suitable extinguishing agents:
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards arising from the substance or mixture None known
Protective equipment: No special measures required.

*
6 Accidental release measures

Personal precautions, protective equipment and emergency procedures Not required.
Environmental precautions: No special measures required.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Reference to other sections
No dangerous substances are released.
See Section 7 for information on safe handling.
See Section 13 for disposal information.

*
7 Handling and storage

Handling:
Precautions for safe handling No special measures required.
Information about protection against explosions and fires: The product is not flammable.
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.

(Contd. on page 3)

Material Safety Data Sheet
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Printing date 03/08/2011 Reviewed on 03/08/2011

Trade name: pGEM®-T Easy

(Contd. of page 2)

8 Exposure controls/personal protection

Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Additional information: *The lists that were valid during the creation were used as basis.*
Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Breathing equipment: *Not required.*
Protection of hands:
Protective gloves
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
Eye protection: *Goggles recommended during refilling.*

9 Physical and chemical properties

General Information	
Appearance:	
Form:	*Fluid*
Color:	*Colorless*
Odor:	*Characteristic*
Odour threshold:	*Not determined.*
pH-value at 20°C (68 °F):	*7.4*
Change in condition	
Melting point/Melting range:	*0°C (32 °F)*
Boiling point/Boiling range:	*100°C (212 °F)*
Flash point:	*Not applicable.*
Flammability (solid, gaseous):	*Not applicable.*
Ignition temperature:	
Decomposition temperature:	*Not determined.*
Auto igniting:	*Product is not selfigniting.*
Danger of explosion:	*Product does not present an explosion hazard.*
Explosion limits:	
Lower:	*Not determined.*
Upper:	*Not determined.*
Vapor pressure:	*Not determined.*
Density:	*Not determined.*
Relative density	*Not determined.*
Vapour density	*Not determined.*
Evaporation rate	*Not determined.*

(Contd. on page 4)

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Trade name: pGEM®-T Easy

(Contd. of page 3)

Solubility in / Miscibility with Water:	Not miscible or difficult to mix.
Segregation coefficient (n-octonol/water):	Not determined.
Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
Solvent content:	
Organic solvents:	0.0 %
Water:	99.9 %
Solids content:	0.1 %
Other information	No further relevant information available.

10 Stability and reactivity

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Incompatible materials: No further relevant information available.
Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

Acute toxicity:
LD/LC50 values that are relevant for classification: No data available
Primary irritant effect:
on the skin: No irritant effect.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

*

12 Ecological information

Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability Not available
Behavior in environmental systems:
Bioaccumulative potential Not known
Ecotoxical effects:
Remark: Not available
Additional ecological information:
General notes: Generally not hazardous for water

(Contd. on page 5)

pSUPER RNAi System™

VECTOR: pSUPER.retro.neo+GFP
CATALOG#: VEC-PRT-0005/0006

Length: 8371 bp

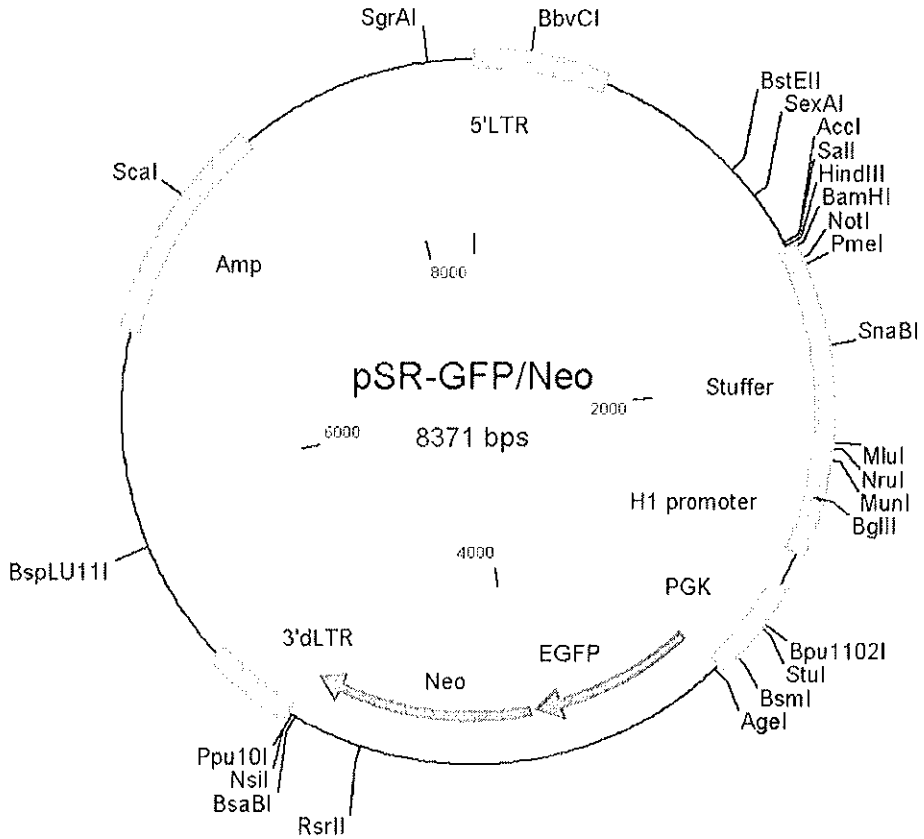
Key Sites

BglII: 2424
HindIII: 1441
EcoRI: 2645
SalI: 1426
XhoI: 1420

Vector Features

PGK promoter: 2770-3168
EGFP ORF: 3186-3919
Neo ORF: 3926-4895
H1 promoter: 2430-2650
Ampicilin resistance ORF: 7443-6577
3' delta LTR: 4910-5277
5' LTR: 8369-513 (homologous to other MSCV LTR)
Stuffer Sequence: 1447-2423

Sequencing primer 5'-GGAAGCCTTGGCTTTTG-3' binding site: 1241-1257
Sequencing primer 5'-CGAACGTGACGTCATC-3' binding site: 2645-2629



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