THE UNIVERSITY OF WESTERN ONTARIO
BIOLOGICAL AGENTS REGISTRY FORM
Approved Biohazards Subcommittee: July 9, 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: Tianqing Peng
DEPARTMENT: Critical Illness Research, Lawson Health Research Inst.
ADDRESS: VRL, A6-140, 800 Commissioners Road, London
PHONE NUMBER: 519 - 685 8500 x 55441
EMERGENCY PHONE NUMBER(S): 519 - 471 0822
EMAIL: tpeng2@uwo.ca

Location of experimental work to be carried out: Building(s) VRL, 6th Floor Room(s) A6-120

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

FUNDING AGENCY/AGENCIES: CIHR and HSFO
GRANT TITLE(S): Role of calpain activation in myocardial dysfunction in sepsis; Targeting mitochondrial ROS to prevent myocardial dysfunction in sepsis; Transformation of normal to abnormal myocardium by diabetes: Role of Ras and calpain.

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

Name	UWO E-mail Address	Date of Biosafety Training
Yixin Yang	YYang348@uwo.ca	Aug. 3. 2010
Amina Iftekhar	aiftekha@uwo.ca	Aug 3. 2010
Manpreet Singh	msingh57@uwo.ca	Aug 3. 2010
Yanpeng Wang	YWang869@uwo.ca	Aug 3. 2010

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.

1). Adenoviruses: they are recombinant E_1-deleted adenoviral vectors containing different genes. they are replication-deficient and used to treat cells. Certified biological safety cabinet and tissue culture room (level-2) will be used. UV light exposure will be used for cabinet. Autoclaves and 1% virkon will be used for decontamination and sterilization. finally biomedical waste container will be used for disposals.

2) Bacteria: DH5α is an engineering bacterium which is used to amplify DNA only. Autoclaves and 1% virkon will be used for decontamination and sterilization. certified BLevel-2 room will be used and biomedical waste container will be used for disposals.

3) Approved cells: Rodent primary cardiomyocytes and Human HeLa cells certified biological safety cabinet and tissue culture room will be used. Biomedical waste container will be used for disposals.

4). Animals: mice.

5). Lipopolysaccharide: It is a component of gram-negative bacteria. we use it to treat cultured cells and mice to mimic human conditions of sepsis. It will be stored in level-2 room. Biomedical waste container will be used for disposals.

Please include a one page research summary or teaching protocol.

Research Summary:

The primary research involves the understanding of the mechanisms of myocardial dysfunction. We utilize a wide range of approaches ranging from cellular, molecular biology to in vivo physiology. Cultured cardiomyocytes and isolated whole hearts are used to study the molecular mechanisms of myocardial dysfunction and the role of key genes/proteins in this process. To assess the physiological significance of each of the molecules, related knockout or transgenic and wild-type animals are employed.

Current research is focused on sepsis-induced myocardial dysfunction. We study the signal transduction mechanisms in cultured cardiomyocytes in response to lipopolysaccharide, an important pathogen for sepsis, and the regulation of myocardial injuries in animal model of sepsis. A variety of approaches including gene silencing and over-expression will be used to investigate the role of gene of interest.

Another research is focused on diabetic cardiomyopathy. We are investigating the molecular mechanisms of hyperglycemia-induced cardiomyocyte injuries and developing the therapeutical strategies to protect the heart from injury as the heart has limited ability to regenerate its damaged tissue. The models of this study include cultured cardiomyocytes and various diabetic mice.

1.0 Microorganisms

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

Do you use microorganisms that require a permit from the CFIA? ○ YES ☒ NO
If YES, please give the name of the species. _____
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)*	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
Adenoviruses	☒ Yes ○ No	○ Yes ○ No	○ Yes ☒ No	1 mL	Applied Biological materials Inc	○ 1 ☒ 2 ○ 2+ ○ 3
Bacteria E.coli. DH5α	☒ Yes ○ No	○ Yes ○ No	○ Yes ☒ No	1-2 Litres	Invitrogen	☒ 1 ○ 2 ○ 2+ ○ 3 — Level 1 JS
	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No			○ 1 ○ 2 ○ 2+ ○ 3
	○ Yes ○ No	○ Yes ○ No	○ Yes ○ No			○ 1 ○ 2 ○ 2+ ○ 3

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

2.0 Cell Culture

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

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

Cell Type	Is this cell type used in your work?	Source of Primary Cell Culture Tissue	AUS Protocol Number
Human	○ Yes ☒ No		Not applicable
Rodent	☒ Yes ○ No	Heart	2008-079 ~~2007-111-12~~ 2009-073.
Non-human primate	○ Yes ☒ No		
Other (specify)	○ Yes ☒ No		

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Supplier / Source
Human	☑ Yes ○ No	HEK 293 cells	Human embryonic Kidney
Rodent	☑ Yes ○ No	H9C2	Rat heart
Non-human primate	○ Yes ☑ No		
Other (specify)	○ Yes ☑ No		

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

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

3.0 Use of Human Source Materials

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

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

Human Source Material	**Source/Supplier /Company Name**	**Is Human Source Material Infected With An Infectious Agent? YES/NO**	**Name of Infectious Agent (If applicable)**	**PHAC or CFIA Containment Level (Select one)**
Human Blood (whole) or other Body Fluid		○ Yes ○ Unknown		○ 1 ○ 2 ○ 2+ ○ 3
Human Blood (fraction) or other Body Fluid		○ Yes ○ Unknown		○ 1 ○ 2 ○ 2+ ○ 3
Human Organs or Tissues (unpreserved)		○ Yes ○ Unknown		○ 1 ○ 2 ○ 2+ ○ 3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

4.0 Genetically Modified Organisms and Cell lines

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

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

Bacteria Used for Cloning *	Plasmid(s) **	Source of Plasmid	Gene Transfected	Describe the change that results from transformation or tranfection
	pMIR-report	Ambion	Huam Sirt1-3'UTR	
E.coli dH52 Bacteria	Flag-Sirt1 GFP-RelA	Addgene	Human Sirt1 Human RelA	Bacteria will be resistant to antibiotics

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

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

Virus Used for Vector Construction	Vector(s) *	Source of Vector	Gene(s) Transduced	Describe the change that results from transduction
Adenoviruses	Ad-CAST	Applied biological materials, Inc.	Rat calpastatin	No changes of cell morphology; Rat calpastatin proteins is expressed.

* Please attach a Material Safety Data Sheet or equivalent.

4.4 Will genetic sequences from the following be involved?

- HIV O YES, please specify _____ ✓ NO
- HTLV 1 or 2 or genes from any Level 1 or Level 2 pathogens O YES, specify _____ ✓ NO
- SV 40 Large T antigen O YES ✓ NO
- E1A oncogene ✓ YES O NO
- Known oncogenes ✓ YES, please specify EIA, RelA, Sirt1 O NO
- Other human or animal pathogen and or their toxins O YES, please specify _____ ✓ NO

4.5 Will virus be replication defective? ✓ YES O NO

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

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

5.0 Human Gene Therapy Trials

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

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

5.2 Will the biological agent be able to replicate in the host? 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? ✓ YES O NO If no, please proceed to section 7.0

6.2 Name of animal species to be used mouse (C57BL/6) and rat (SD)

6.3 AUS protocol # 2008-07, 2007-111-12, 2009-073

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

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

Because they will not be used in live animals.

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 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

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) Lipopolysaccharide
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 7.67 mg/Kg, mouse (I.V.)

8.4 How much of the toxin is handled at one time*? 10 µg ~ 1 mg

8.5 How much of the toxin is stored*? 10 mg

8.6 Will any biological toxins be used in live animals? (X) YES, Please provide details: 4mg/Kg single dose. I.P. 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
If YES, Please attach the CFIA permit & describe any
_____
_____

See E-mail

11.0 Import Requirements

11.1 Will any of the above agents be imported? (X) YES, please give country of origin ~~USA~~ Canada per e mail Jan 12/11 JS. O NO
If no, please proceed to Section 12.0

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

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

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

12.0 Training Requirements for Personnel Named on Form

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

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

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

SIGNATURE _____

13.0 Containment Levels

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

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

X YES, permit # if on-campus _____

O NO, please certify

O NOT REQUIRED for Level 1 containment

Certified by Gail Ryder Jaime Ryder

14.0 Procedures to be Followed

14.1 As the Principal Investigator, I will ensure that this proje
Procedures Manual for Containment Level 1 & 2 Laboratorie
projects). I will ensure that UWO faculty, staff and students
Communication Form, found at http://www.wph.uwo.ca/

Containment Level?

SIGNATURE _____ Date: _____

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

_____

_____

_____

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

_____

_____

See E-mail

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: Jaime Ryder
Date: August 13, 2010

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

Special Conditions of Approval:

Subject: Fwd: Re: Biological Agents Registry Form (Peng)
From: Jennifer Stanley <jstanle2@uwo.ca>
Date: Wed, 12 Jan 2011 16:41:33 -0500
To: Tianqing Peng <tpeng2@uwo.ca>

Thanks Dr. Peng
I will change Section 11 so that the country of origin is Canada (not USA).
Regards
Jennifer

-------- Original Message --------
Subject: Re: Biological Agents Registry Form (Peng)
Date: Wed, 12 Jan 2011 09:51:57 -0500
From: Tianqing Peng <tpeng2@uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>

Thanks for the reviewers' comments and we have made changes accordingly. Attached please find the revised pages (Page9-4, 5, 6). Please let me know if you need hard copy.

For Question: "Section 2.2 suggests that you will be using rodent hearts but section 6.1 does not reflect any animal work"?
Answer: This was my misunderstanding. Yes, we will use rodenmt hearts but we will not use either adenovisuses or other pathogens in living mice.

For Question: "The committee wondered whether the lab already has the viruses and if it was brought in without an import permit (re: Section 11)."

Answer: This recombinant adnovirus (Ad-CAST) was from Applied Biological Materials, Inc. in Richman, BC, Canada. It does not need an import permit.

Thanks

Tianqing

----- Original Message -----
From: Jennifer Stanley <jstanle2@uwo.ca>
Date: Tuesday, January 11, 2011 5:10 pm
Subject: Biological Agents Registry Form (Peng)
To: Tianqing Peng <tpeng2@uwo.ca>

> Hi Dr. Peng
>

Fwd: Re: Biological Agents Registry Form (Peng)

> Your project was reviewed at the December Biohazards Subcommittee meeting. Please make the following changes and re-send:
>
> E.coli in section 1.2 should not be listed as pathogenic.
> Section 4.3 should describe the changes.
> Section 4.4 should be modified as RELA is also an oncogene. SIRT1 also has oncogenic potential.
> Section 2.4 - The containment level should be level 2+. See the Viral Vector Policy: http://www.uwo.ca/humanresources/facultystaff/h_and_s/biosafety/biosafety_policies.htm
> Section 2.2 suggests that you will be using rodent hearts but section 6.1 does not reflect any animal work.
> The committee wondered whether the lab already has the viruses and if it was brought in without an import permit (re: Section 11).
>
> Regards,
> Jennifer
>

Biosafety 20110001.pdf	**Content-Type:**	application/pdf
	Content-Encoding:	base64

-------- Original Message --------
Subject: Re: Biological Agents Registry Form: Peng
Date: Tue, 02 Nov 2010 21:23:50 -0400
From: Tianqing Peng <tpeng2@uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>

Email (Section 14.0)

Thanks, Jennifer.

Here are the answers for your question:

(1) For 1.2, it is ok;
(2) For Section 4.2, DH5alpha bacteria will become resistent to ampicillin if the recombinant DNA plasmid is transformed into DH5alpha.
(3) For Section 4.6, it is ok.
(4) For Section 14.2, the following procedures will be done

(1) Washing the exposed site immediately with soap and water after allowing the wound to bleed freely;
(2) If mucous (eyes, nose, mouth) membrane or non-intact (cuts, rash, eczema or dermatitis) skin contact, flush with water at the nearest faucet or eye wash station for a minimum of ten minutes;
(3) Immediately inform the Supervisor/Principal Investigator of the exposure incident;
(4) Seek prompt medical attention at Workplace Health (during the hours of operation), the nearest hospital emergency department or emergency clinic,or a Medical Practitioner of their choosing;
(5) Report the accident/incident.

Please let me know if further information required.

Tianqing

----- Original Message -----
From: Jennifer Stanley <jstanle2@uwo.ca>
Date: Tuesday, November 2, 2010 5:02 pm
Subject: Biological Agents Registry Form: Peng
To: Tianqing Peng <tpeng2@uwo.ca>

> Hi Dr. Peng -
>
> Thanks for your recent submission.
>
> 1.2 needs to be modified as DH5alpha is not containment level 2. - Form can be changed by OHS (assuming you are okay with this)
> Section 4.2 should state the change(s) that result. - Please address by e-mail
> Section 4.6 should state 'yes'. - Form can be changed by OHS (assuming you are okay with this)
> Section 14.3 needs to include more details in terms of washing the wounds. - Please address by e-mail
>
> Regards
> Jennifer

MSDS'

Chemical Material Safety Data Sheet

Product: Ad-Adenovirus 5
Cat. #: 000013A

Date Updated: June 24th, 2010
Date Printed: August 6th, 2010

Section 1: Product and Company Information

Product Name:	Ad-Adenovirus 5
Cat. No.:	000013A
Company:	ABM Inc.
Address:	#8-13520 Crestwood Place Richmond, BC V6V2G2
Phone:	604-247-2416
Fax:	604-247-2414
Emerg. Phone:	866-757-2414

Section 2: Composition and Information on Ingredients

Substance Name:	Adenovirus Product
CAS Number:	None
SARA 313:	No
Ingredient Name:	Ad-Adenovirus 5
CAS Number:	None
SARA 313:	No
Percent:	0.0001
Ingredient Name:	Dulbecco's Modified Eagle's Medium (Solution)
CAS Number:	None
SARA 313:	No
Percent:	89.9999
Ingredient Name:	Fetal Bovine Serum, Manufacturing Use
CAS Number:	None
SARA 313:	No
Percent:	10.0

Section 3: Hazard Identification

Emergency Overview

HMIS Classification	
Health Hazard:	0
Reactivity:	0
Flammability:	0
NFPA Classification	
Health Hazard:	0
Reactivity:	0
Flammability:	0

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

Section 4: First Aid Measures

Eye Contact
Rinse thoroughly with plenty of water for at least 15 minutes. Assure adequate flushing by seperating the eyelids with fingers. Consult a physician.

Skin Contact
Wash off with soap and plenty of water. Consult a physician.

Inhalation
If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

Ingestion
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Section 5: Fire Fighting Measures

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special Protective Equipment for Fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

Section 6: Accidental Release Measures

Personal Precautious
Exercise appropriate precautions to minimize direct contact with skin or eyes, and prevent inhalation of dust.

Methods for Cleaning up
Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7: Handling and Storage

Handling
User Exposure: Avoid inhalation. Avoid contact with eyes, skin, and clothing. Avoid prolonger or repeated exposure.

Storage
Suitable: Keep tightly closed.
Store at -70C

Section 8: Exposure Controls and PPE

Engineering Controls
Safety shower and eye bath. Mechanical exhaust required.

Personal Protective Equipment
Resiratory:
Use respirators and components tested and approved uder appropriate government standards, such as NIOSH (USA) or CEN (EU). Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (USA) or Type P1 (EN143) dust masks.
Hand:
Protective gloves.
Eye:
Chemical safety goggles.

General Hygiene Measures
Wash thoroughly after handling.

Section 9: Physical and Chemical Properties

N/A

Section 10: Stability and Reactivity

Stability
Stable.

Materials to Avoid:

Strong oxidizing agents.

Hazardous Decomposition Products
Nature of decomposition products not known.

Hazardous Polymerization
Will not occur.

Section 11: Toxicological Information

Route of Exposure

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

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

Section 12: Ecological Information

N/A

Section 13: Disposal Considerations

Contact a licensed, professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state/provincial, and local environment regulations.

Section 14: Transport Information

DOT
Proper Shipping Name: None
This substance is considered to be non-hazardous for transport.

IATA
This substance is considered to be non-hazardous for air transport.

Section 15: Regulatory Information

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

The information contained in this Material Safety Data Sheet is believed to be accurate, but it is the responsibility of the user or supplier to determine the applicability of these data to the formulation of necessary safety precautions.

Applied Biological Materials Inc. shall not be held responsible for any damage resulting from the use of the above [illegible]

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

Product code 18265017
Product name Subcloning Efficiency ™ DH5alpha™ Competent Cells

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

SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 09/24/2009
Date Updated: 05/07/2009
Version 1.4

Section 1 - Product and Company Information

Product Name	LIPOPOLYSACCHARIDE FROM SALMONELLA TYPHOSA PHENOL EXTRACT
Product Number	L6386
Brand	SIGMA
Company	Sigma-Aldrich Canada, Ltd
Address	2149 Winston Park Drive Oakville ON L6H 6J8 CA
Technical Phone:	9058299500
Fax:	9058299292
Emergency Phone:	800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
LIPOPOLYSACCHARIDE FROM SALMONELLATYPHOSAPHENOL EXTRACT	None	No

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Harmful.
Pyrogen. May cause fever. Do not use if skin is cut or scratched. Wash thoroughly after handling.

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.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

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: 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.

Section 6 - Accidental Release Measures

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

STORAGE
Store at 2-8°C

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Mechanical exhaust required.

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 dust mask type N95 (US) or type P1 (EN 143) respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

Section 9 - Physical/Chemical Properties

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.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Nitrogen oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Multiple Routes: May be harmful by inhalation, ingestion, or skin absorption.

CONDITIONS AGGRAVATED BY EXPOSURE
The toxicological properties have not been thoroughly investigated.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: Xn
Indication of Danger: Harmful.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Harmful.
US Statements: Pyrogen. May cause fever. Do not use if skin is cut or scratched. Wash thoroughly after handling.

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

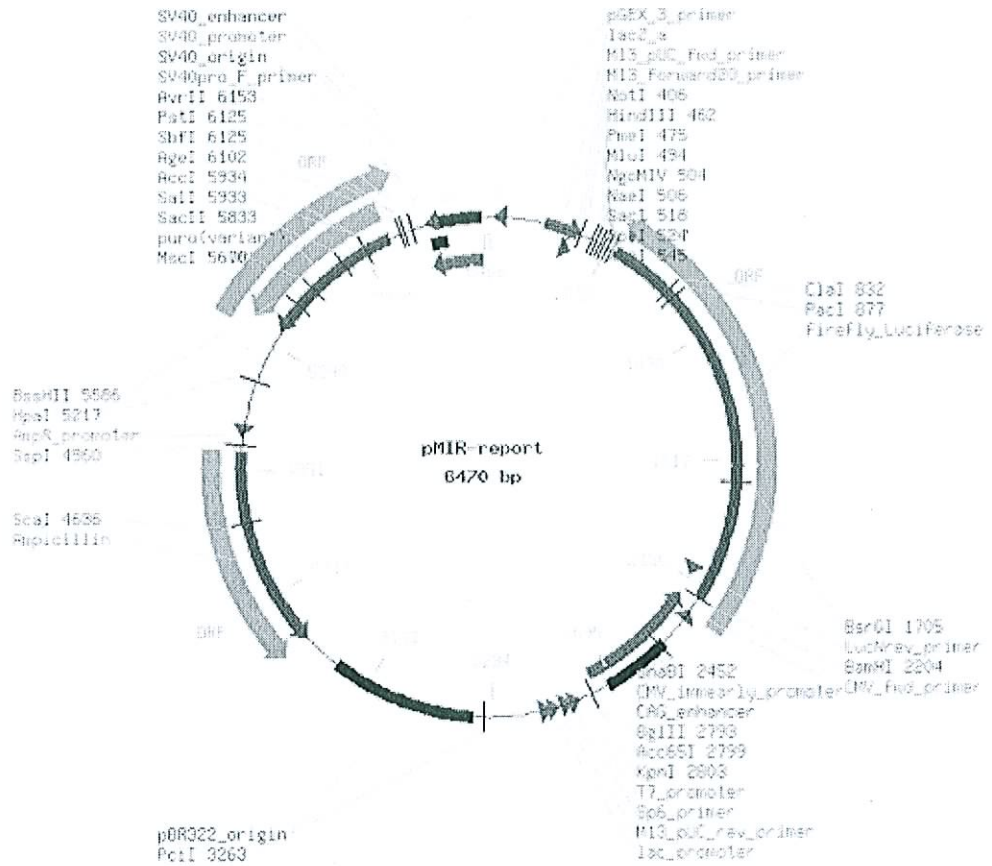
Section 16 - Other Information

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.

Plasmid Map(s)

Plasmid Name	pMIR-report
Source/Vendor	Ambion
Plasmid Type	Mammalian
Promoter	CMV
Plasmid Size	6470
Sequencing Primer	Luc-F, M13-F20
Bacterial Resistance	Ampicillin
Mammalian Selection	Puromycin
Notes	The pMIR-REPORT Luciferase miRNA Expression Reporter Vector contains firefly luciferase under the control of a mammalian promoter/terminator system, with a miRNA target cloning region downstream of the luciferase translation sequence. This vector is optimized for cloning of miRNA targets and evaluation of miRNA regulation.
Plasmid Sequence	View Sequence



addgene

Find this plasmid at: www.addgene.org
Enter "13812" in the search box

Plasmid 13812: SIRT1 Flag

Gene/insert name	SIRT1
Insert size (bp)	2000
Gene/insert aliases	SIRT1, SIR2L1
Species of gene(s)	H. sapiens (human)
Relevant mutations/deletions	N-terminus truncated
Fusion proteins or tags	flag
Terminal	C terminal on backbone
Vector backbone	pcDNA3.1 + (Search Vector Database)
Backbone manufacturer	Invitrogen
Type of vector	Mammalian expression
Backbone size (bp)	5500
Cloning site 5'	NotI
Site destroyed during cloning	No
Cloning site 3'	NotI
Site destroyed during cloning	No
5' Sequencing primer	T7 (List of Sequencing Primers)
3' Sequencing primer	BGH Reverse
Bacteria resistance	Ampicillin
High or low copy	High Copy
Grows in standard E. coli @ 37C	Yes
Selectable markers	Neomycin
If you did not originally clone this gene, from whom and where did you receive the plasmid used to derive this plasmid	Roy Frye
Sequence	Visit www.addgene.org/13812
Author's Map	Visit www.addgene.org/13812
Plasmid Propagation	DH5a
Principal Investigator	Eric Verdin

Comments: cloned into a version of pcDNA3.1 that has been modified to include a C-terminal Flag tag (see author's map for details).

Article: The human Sir2 ortholog, SIRT2, is an NAD+-dependent tubulin deacetylase. North BJ et al. (Mol Cell. 2003 Feb . 11(2):437-44. 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 13812" 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/13812 for updated plasmid information and related links.

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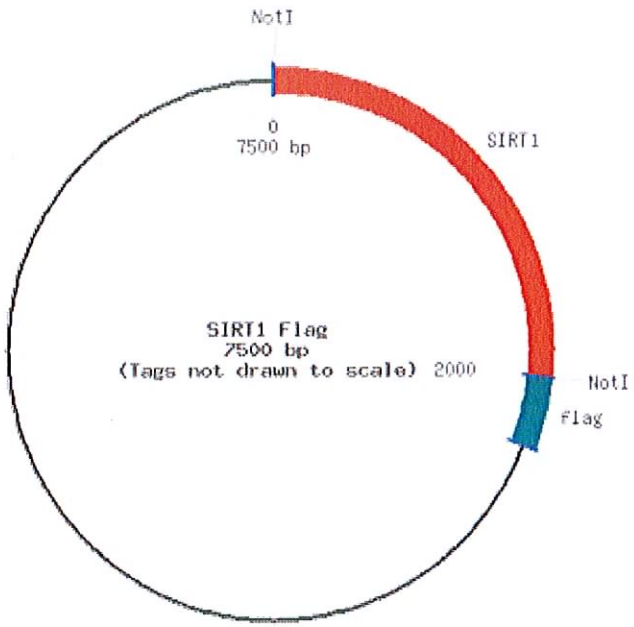

Please check www.addgene.org/13812 for updated plasmid information and related links.

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Enter "23255" in the search box

Plasmid 23255: GFP-RelA

Gene/insert name:	p65
Alternative names:	GFP-p65
Insert size (bp):	1600
Gene/insert aliases:	RELA, p65, NFKB3, MGC131774
Species of gene/s):	H. sapiens (human)
Fusion proteins or tags:	EGFP
Terminal:	N terminal on insert
Vector backbone:	pEGFP-C1 (Search Vector Database)
Backbone manufacturer:	Clontech
Type of vector:	Mammalian expression
Backbone size (bp):	4700
Cloning site 5:	BamHI
Site destroyed during cloning:	No
Cloning site 3:	XbaI
Site destroyed during cloning:	No
5' Sequencing primer:	EGFP-C (List of Sequencing Primers)
3' Sequencing primer:	SV40pA-R
Bacteria resistance:	Kanamycin
High or low copy:	Low Copy
Grow in standard E. coli @ 37C:	Yes
Selectable markers:	Neomycin
Sequence:	Visit www.addgene.org/23255
Plasmid Provided In:	DH5a
Principal Investigator:	Warner Greene

Article: Duration of nuclear NF-kappaB action regulated by reversible acetylation. Chen Lf et al. (Science. 2001 Aug 31. 293 (5535):1653-7. Pubmed)

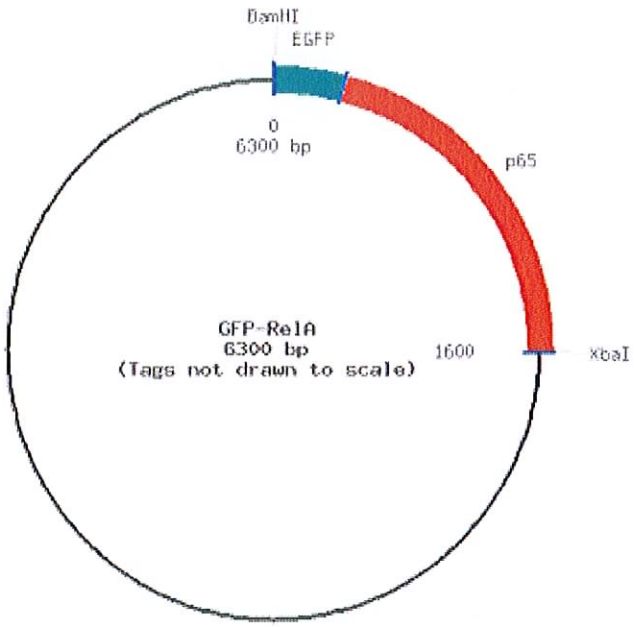
Please acknowledge the principal investigator and cite this article if you use this plasmid in a publication.

Also, please include the text "Addgene plasmid 23255" 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/23255 for updated plasmid information and related links.

addgene

Find this plasmid at: www.addgene.org
Enter "23255" in the search box



Please check www.addgene.org/23255 for updated plasmid information and related links.