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	Daniel J. Belliveau
DEPARTMENT	Anatomy & Cell Biology
ADDRESS	Dental Sciences Building, room DSB 00060
PHONE NUMBER	Ext. 86830 OR 88235
EMERGENCY PHONE NUMBER(S)	519 473-6700 (cell: 519 852-3172)
EMAIL	dbellive@uwo.ca

Location of experimental work to be carried out: Building(s) Dental Sciences Building Room(s) 00060

*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:___Natural Sciences and Engineering Research Council
GRANT TITLE(S): ____Neurostorphic Control of Gap Junction Function in Neurons

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

Name	UWO E-mail Address	Date of Biosafety Training
Mandeep Sidhu	Msihdu6@uwo.ca	21-Jan-2009

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.

Retroviruses
Used in in vitro cell culture experiments in a level 2 certified biosafety cabinet and laminar flow hood. All agents and exposed materials and fluids are decontaminated with 6% sodium hypoclorite solution. Retroviral vectors are transfected into 293 Human Embryonic Kidney packaging cells and media containing retroviral particles collected, filtered and stored at -80 °C prior to use.

Adenovirus
Used in in vitro cell culture experiments in a level 2 certified biosafety cabinet and laminar flow hood. All agents are stored at -80 °C prior to use and all exposed materials and fluids decontaminated with 6% sodium hypoclorite solution.

E. coli bacteria
Used to propagate plasmid vectors. Stocks grown in luria Broth or LB-agar plates are stored at 4 °C for approximately 1 month after use and disposed of by decontamination with bleach or autoclaving (plates). Stocks of competent bacteria are stored at -80 °C.

Please include a one page research summary or teaching protocol.

Neurons are specialized cells responsible for transmitting and receiving impulses that control our movements and sensations of the outside world. As neurons develop, they rely upon factors in the environment that support their survival. These factors, called neurotrophins have a number of family members, one of which is nerve growth factor or NGF. NGF regulates many neuronal functions including survival, growth of axons and cellular responses to the environment. Our laboratory is studying how NGF regulates the communication between neurons through specialized bridges called gap junctions. These bridges, or channels, allow small molecules to pass between cells, molecules important in many functions of the neuron.

Our research will examine how neurotrophins such as NGF open gap junction channels and what cellular mechanisms are specifically involved in stimulating the gap junctions to move to the surface of the neuron and contact its neighbor. It is very important to understand the methods used to move these molecules from the site of production (the control centre of the neuron, called the cell body) to the far-reaching processes that neurons extend to contact other neurons. This movement with be looked at by tagging the gap junction proteins with a glowing protein tag call green fluorescent protein. This will allow us to trace where the gap junctions are moving in the neuron and how this changes when the neurons are stimulated with NGF.

Gap junctions are important for proper development of the nervous system. In addition they help neurons coordinate information between one another. Knowing how gap junctions are used by neurons and how these channels open and close is essential in better understanding the importance of gap junctions during the development and normal functioning of neurons in the nervous system.

1.0 Microorganisms

1.1 Does your work involve the use of biological agents? ✓ 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 ✓ 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
Mouse retrovirus (VSV-G)	O Yes ✓ No	O Yes ✓ No	O Yes ✓ No	1 x 10^9 pfu per virus	Generated in house	O 1 ✓ 2 O 2+ O 3
Adenovirus (recombin. deficient)	✓ Yes O No	✓ Yes O No	O Yes ✓ No	1 x 10^{11} pfu per virus		O 1 ✓ 2 O 2+ O 3
E. coli bacteria	O Yes ✓ No	O Yes ✓ No	O Yes ✓ No			✓ 1 O 2 O 2+ O 3
	O Yes O No	O Yes O No	O Yes O No			

*Please attach a Material Safety Data Sheet or equivalent

E.coli dH5 alpha, JM 109

2.0 Cell Culture

2.1 Does your work involve the use of cell cultures? ✓ 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 ✓ No		Not applicable
Rodent	✓ Yes O No	Nervous tissue	2009-056
Non-human primate	O Yes ✓ No		
Other (specify)	O 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)*	Containment Level of each cell line	Supplier / Source of cell line(s)
Human	✓ Yes O No	SHSY5Y, IMR-32, SKNMC, 293 HEK	Level 2	ATCC
Rodent	✓ Yes O No	PC12, N2A	Level 1	ATCC, collaborators
Non-human primate	O Yes ✓ No			
Other (specify)	O 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 O 1 ✓ 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 ✓ 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? ✓ YES O NO If no, please proceed to Section 5.0

4.2 Will genetic modification(s) involving plasmids be done? ✓ 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 (DH5-alpha, JM109)	*pCMV-6*	*Origine*	*Connexins*	*Cellular phenotype changes, growth rate changes*

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

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

Virus Used for Vector Construction	Vector(s) *	Source of Vector	Gene(s) Transduced	Describe the change that results from transduction
Retrovirus (VSV-G)	*Mao et al. (2000) – map attached*	*Collaborator*	*Connexin genes*	*Cellular phenotype changes, growth rat changes*

* 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 O YES ✓ NO
- Known oncogenes O YES, please specify _____ ✓ 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

EIA (YES)

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____rat_____

6.3 AUS protocol # ____2009-056_____

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:

_____

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 ✓ 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 ✓ 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 ✓ 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 ✓ 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_____ ✓ 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 ✓ 2 O 2+ O 3

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

✓ YES, date of most recent biosafety inspection: _____

O NO, please certify

O NOT REQUIRED for Level 1 containment

13.3 Please indicate permit number (not applicable for first time applicants): BIO-UWO-0003

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.

_____

_____

_____

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:

Upon exposure of such biological agents, immediate first aid treatment will be sought and offered by a qualified first aid officer of the department and if necessary by visiting the nearest emergency department (University Hospital). Standard first aid measures will include cleaning the injury site with antiseptic (e.g. hydrogen peroxide) or by continuous washing at either an eye wash station, lab sink or if larger exposure, emergency whole body shower stations.

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:_____November 30, 2010 _____

15.0 Approvals

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

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

3) Safety Officer for Institution where experiments will take place (if not UWO):
SIGNATURE:_____
Date:_____

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

Special Conditions of Approval:

-------- Original Message --------
Subject: Re: Fwd: Biological Agents Registry Form: Bellilveau
Date: Mon, 31 Jan 2011 15:02:44 -0500
From: Daniel Belliveau <Daniel.Belliveau@schulich.uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>

Hello Jennifer,

I have attached the updated biological agents registry. I am sorry for the delay.

I believe that I addressed all of the committee's concerns however, let me know if I missed something. I have corrected:

1. spelling of E. coli and luria broth
2. biological concerns of adenoviruses
3. packaging cell line for the retroviruses, addition of a vector map for the retrovirus
4. first aid measures in the event of accidental exposure
5. MSDS for adenovirus and retrovirus (the adenoviral and retroviral vectors and packaging cell lines we have were not commercially produced and thus I do not have a specific MSDS - the one included here comes from reputable companies making similar transduction agents)

Dan

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

Material Safety Data Sheet(s)

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 BIOLABS, INC.
Creating Solutions for Life Science Research

Material Safety Data Sheet

SECTION 1. PRODUCT IDENTIFICATION

Catalog Number: RV-200 and RV-201
Product Name: ViraDuctin™ Retrovirus Transduction Kit

MANUFACTURER:

Cell Biolabs, Inc.
7758 Arjons Drive
San Diego, CA 92126

EMERGENCY CONTACT:

+1 858 271 6500
info@cellbiolabs.com

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Kit Components

1. ViraDuctin™ Retrovirus Transduction Reagent A (100X) (Part No. 320004): One sterile tube, 200 µL
2. ViraDuctin™ Retrovirus Transduction Reagent B (100X) (Part No. 320005): One sterile tube, 200 µL – Non-Hazardous
3. ViraDuctin™ Retrovirus Transduction Reagent C (8X) (Part No. 320006): Two sterile tubes, 1.5 ml each – Non-Hazardous

HAZARDOUS INGREDIENTS

ViraDuctin™ Retrovirus Transduction Reagent A (100X) (Part No. 320004): One sterile tube, 200 µL
Proprietary ingredient, classified as health hazard level 1 for both HMIS classification and NFPA rating

SECTION 3. WASTE DISPOSAL

Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

SECTION 4. FIRST-AID MEASURES

- IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
- IN CASE OF SKIN CONTACT, FLUSH WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. CALL A PHYSICIAN.

- 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. SAFETY HANDLING PROCEDURES

- Should be handled by trained personnel observing good laboratory practices.
- Avoid breathing vapor.
- Avoid skin contact or swallowing.
- May cause allergic reaction in sensitized individuals.

SECTION 6. ACCIDENTAL RELEASE MEASURES

EVACUATE AREA. WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES. ABSORB WITH SAND OR VERMICULITE, 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.

The above information is believed to be correct but does not purport to be all inclusive and should be used only as a guide for experienced personnel. Cell Biolabs, Inc. shall not be held liable for any damage resulting from the handling or from contact with the above product(s).

7758 Arjons Drive, San Diego, CA 92126
Phone (858) 271 6500
US Toll Free (888) CBL 0505
Fax (858) 271 6514
info@cellbiolabs.com

ATCC | THE ESSENTIALS OF LIFE SCIENCE RESEARCH GLOBALLY DELIVERED™

Info for Cell Line(s)

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, depositing institution.

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

Cell Biology

ATCC® Number:	**CRL-2266™** Order this Item	**Price:**	**$272.00**
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		
	PHOTO		
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.		

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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
Subculturing:	**Protocol:** These cells grow as a mixture of floating and adherent cells. The cells grow as clusters of neuroblastic cells with multiple, short, fine cell processes (neurites). Cells will aggregate, form clumps and float. Remove the medium with the floating cells, and recover the cells by centrifugation. Rinse the adherent cells with fresh 0.25% trypsin, 0.53 mM EDTA solution, add an additional 1 to 2 ml of trypsin solution, and let the culture sit at room temperature (or at 37C) until the cells detach. Add fresh medium, aspirate, combine with the floating cells recovered above and dispense into new flasks. **Subcultivation Ratio:** A subcultivation ratio of 1:20 to 1:50 is recommended **Medium Renewal:** Every 4 to 7 days
Preservation:	**Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO **Storage temperature:** liquid nitrogen vapor phase
Doubling Time:	48 hrs

Related Products: recommended serum:ATCC 30-2020
parental cell line:ATCC HTB-11

References:

22554: Ross RA, et al. Coordinate morphological and biochemical interconversion of human neuroblastoma cells. J. Natl. Cancer Inst. 71: 741-749, 1983. PubMed: 6137586

23032: Biedler JL, et al. Multiple neurotransmitter synthesis by human neuroblastoma cell lines and clones. Cancer Res. 38: 3751-3757, 1978. PubMed: 29704

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ATCC® Number:	**CCL-127™** Order this Item	**Price:**	**$264.00**
Designations:	IMR-32		
Depositors:	WW Nichols		
Biosafety Level:	1		
Shipped:	frozen		
Medium & Serum:	See Propagation		
Growth Properties:	adherent		
Organism:	*Homo sapiens* (human)		
Morphology:	fibroblast; neuroblast		
	PHOTO		
Source:	**Organ:** brain **Disease:** neuroblastoma **derived from metastatic site:** abdominal mass		
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.		
Isolation:	**Isolation date:** April, 1967		
Applications:	transfection host (technology from amaxa)		
Virus Resistance:	echovirus 11		

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DNA Profile (STR):	Amelogenin: X,Y CSF1PO: 11,12 D13S317: 9 D16S539: 8 D5S818: 11,12 D7S820: 9,10 THO1: 7,9.3 TPOX: 11 vWA: 15
Cytogenetic Analysis:	Stable male karyotype with stemline number of 49. Two large marker chromosomes with submedian centromeres. A deletion in one number 1 chromosome: One number 16 chromosome missing; two extra chromosomes in C group. Sublines with 50 and 48 chromosomes differ from those with 49 chromosomes by having an extra or missing C group chromosome respectively.
Isoenzymes:	G6PD, B
Age:	13 months
Gender:	male
Ethnicity:	Caucasian
Comments:	The IMR-32 cell line was established by W.W. Nichols, J. Lee and S. Dwight in April, 1967 from an abdominal mass occurring in a 13-month-old Caucasian male. [22190] The tumor was diagnosed as a neuroblastoma with rare areas of organoid differentiation. Two cell types are present. Predominant is a small neuroblast-like cell. The other is a large hyaline fibroblast. The cell line was submitted to the American Type Culture Collection in the 36th passage. It has been demonstrated that the cells can be propagated successfully beyond the 80th serial subculture.
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%. **Temperature:** 37.0°C
Subculturing:	**Protocol:** Remove medium, and rinse with 0.25% trypsin, 0.53 mM EDTA solution. Remove the solution and add an additional 1 to 2 ml of trypsin-EDTA solution. Allow the flask to sit at room temperature (or at 37C) until the cells detach. Add fresh culture medium, aspirate and dispense into new culture flasks.Maintain cultures at a cell concentration between 4 X 10 exp4 and 4 X 10 exp5 cells/cm2. **Subcultivation Ratio:** A subcultivation ratio of 1:3 to 1:6 is recommended **Medium Renewal:** Every 2 to 3 days
Preservation:	**Freeze medium:** Complete growth medium 95%; DMSO, 5% **Storage temperature:** liquid nitrogen vapor temperature
Doubling Time:	approximately 20 hrs.
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003 recommended serum:ATCC 30-2020

References:

22190: Tumilowicz JJ, et al. Definition of a continuous human cell line derived from neuroblastoma. Cancer Res. 30: 2110-2118, 1970. PubMed: 5459762
32287: Rostomily RC, et al. Expression of neurogenic basic helix-loop-helix genes in primitive neuroectodermal tumors. Cancer Res. 57: 3526-3531, 1997. PubMed: 9270024
32459: Maestrini E, et al. A family of transmembrane proteins with homology to the MET-hepatocyte growth factor receptor. Proc. Natl. Acad. Sci. USA 93: 674-678, 1996. PubMed: 8570614

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Cell Biology

ATCC® Number:	**CRL-1573™**	Order this Item	Price:	**$279.00**

Designations:	293 [HEK-293]
Depositors:	FL Graham
Biosafety Level:	2 [CELLS CONTAIN ADENOVIRUS]
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial 
Source:	**Organ:** embryonic kidney **Cell Type:** transformed with adenovirus 5 DNA
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Restrictions:	These cells are distributed for research purposes only. 293 cells, their products, or their derivatives may not be distributed to third parties.
Applications:	efficacy testing [92587] transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents) viruscide testing [92579]
Receptors:	vitronectin, expressed
Tumorigenic:	YES
DNA Profile (STR):	Amelogenin: X CSF1PO: 11,12 D13S317: 12,14 D16S539: 9,13 D5S818: 8,9 D7S820: 11,12 THO1: 7,9.3 TPOX: 11 vWA: 16,19
Cytogenetic Analysis:	

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Cell Biology

ATCC® Number:	CRL-1721™ Order this Item	**Price:**	$256.00
Designations:	PC-12		
Depositors:	B Patterson		
Biosafety Level:	1		
Shipped:	frozen		
Medium & Serum:	See Propagation		
Growth Properties:	floating clusters; few scattered lightly attached cells.		
Organism:	Rattus norvegicus (rat)		
Morphology:	small irregularly shaped cells		
			
Source:	**Organ:** adrenal gland **Disease:** pheochromocytoma		
Cellular Products:	catecholamines; dopamine; norepinephrine [1163]		
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.		
Applications:	transfection host (Roche FuGENE® Transfection Reagents technology from amaxa)		
Receptors:	nerve growth factor (NGF), expressed		
Tumorigenic:	Yes		
Cytogenetic Analysis:	40 chromosomes; 38 autosomes plus XY [1163]		

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Gender: male

Comments: The PC-12 cell line was derived from a transplantable rat pheochromocytoma. [1163]
The cells respond reversibly to NGF by induction of the neuronal phenotype when plated on Collagen IV coated culture flasks. [1163]
The cells do not synthesize epinephrine. [1163]

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium:

- heat-inactivated horse serum to a final concentration of 10%
- fetal bovine serum to a final concentration of 5%

Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing: **Protocol**: Volumes used for this protocol are for a 75cm2 flask; proportionally reduce or increase amount of dissociation medium for culture vessels of other sizes.

- Transfer cell suspension to centrifuge tube. Centrifuge cells at 180 to 225 xg for 8-15 minutes at room temperature.
- Remove and discard supernatant leaving cell pellet.
- Resuspend the cell pellet in an appropriate volume of fresh medium (about one tenth of the original volume.
- Gently aspirate each 5 ml aliquot of cells 4 or 5 times with a new 20 ml syringe outfitted with a 22g (1½ in.) needle to break up cell clusters.
- Add appropriate aliquots of the cell suspension to new 75 cm2 flask with 10-15 ml fresh growth medium. Seed flask 5 x 10(5) to 1 x 10(6) viable cells/ml or use subcultivation ratio of 1:2 to 1:4.
- Place culture vessels in incubator at 37°C Subculture when cell density reaches between 2-4 x 10(6) viable cells/ml.

Medium Renewal: Every 2 to 3 days

Preservation: **Freeze medium:** Complete growth medium supplemented with 10% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Doubling Time: 48 hrs

Related Products: Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001
recommended serum:ATCC 30-2020
Related cell line: ATCC CRL-1721.1, PC-1

References:
1162: Levi A, et al. Molecular cloning of a gene sequence regulated by nerve growth factor. Science 229: 393-395, 1985. PubMed: 3839317
1163: Greene LA, Tischler AS. Establishment of a noradrenergic clonal line of rat adrenal pheochromocytoma cells which respond to nerve growth factor. Proc. Natl. Acad. Sci. USA 73: 2424-2428, 1976. PubMed: 1065897
22344: Biocca S, et al. A macromolecular structure favouring microtubule assembly in NGF- differentiated pheochromocytoma cells (PC12). EMBO J. 2: 643-648, 1983. PubMed: 6641712
33014: Weber E, et al. Distinct functional properties of Rab3A and Rab3B in PC12 neuroendocrine cells. J. Biol. Chem. 271: 6963-6971, 1996. PubMed: 8636125
16173681: U.S. Pharmacopeia USP Monographs: Small Intestinal Submucosa Wound Matrix. Rockville, MD. USP32-NF27, 2005

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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:	

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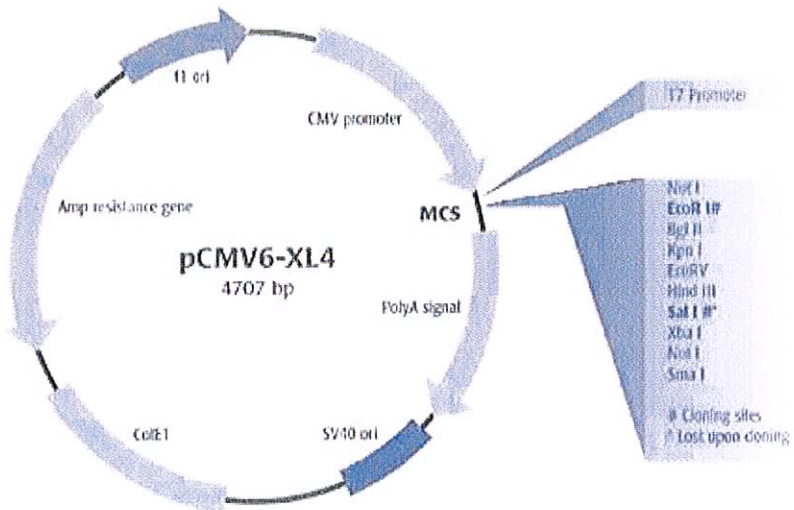
Vector Diagram

Vector Sequences: pCMV6-XL4 pCMV6- XL5 pCMV6-XL6

Vector Diagram:

All three OriGene pCMV6 vectors were constructed with the same features and mult exception, that pCMV-XL6 has an SP6 transcriptional promoter instead of T7. The t presented diagrammatically below.



Sequence Map for all Vectors are in the Application Manual and the Primer and Pror separately here.

Section 4

Over 1000 citations of OriGene cDNA clones

Constitutive recycling of the store-operated Ca2+ channel Orai1 and its internalization during meiosis J. Cell Biol., Nov 2010; 191: 523 - 535 [CAV1]

Cooperative Role of NF-{kappa}B and Poly(ADP-ribose) Polymerase 1 (PARP-1) in the TNF-induced Inhibition of PHEX Expression in Osteoblasts J. Biol. Chem., Nov 2010; 285: 34828 - 34838. [PARP1]

Gprc5a Deletion Enhances the Transformed Phenotype in Normal and Malignant Lung Epithelial Cells by Eliciting Persistent Stat3 Signaling Induced by Autocrine Leukemia Inhibitory Factor Cancer Res., Nov 2010; 70: 8917 - 8926 [SOCS3]

Human Sodium Phosphate Transporter 4 (hNPT4/SLC17A3) as a Common Renal Secretory Pathway for Drugs and Urate J. Biol. Chem., Nov 2010; 285: 35123 - 35132 [SLC17A3]

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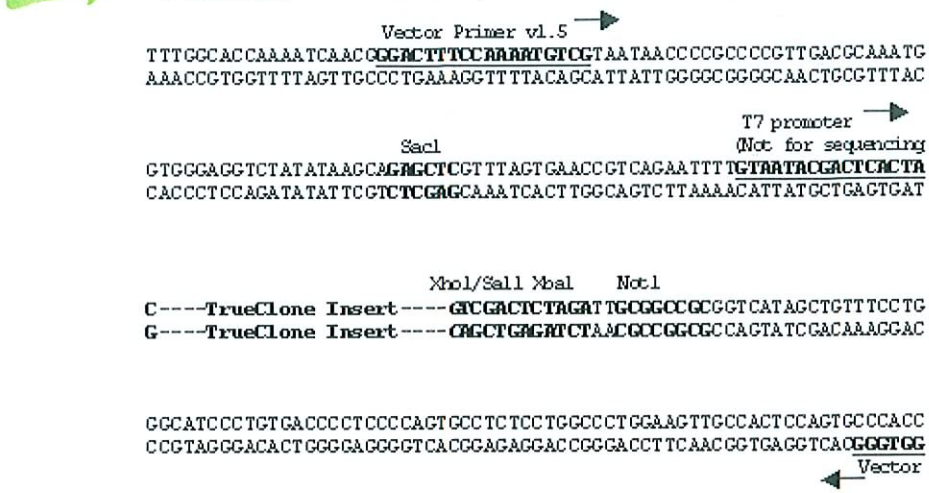
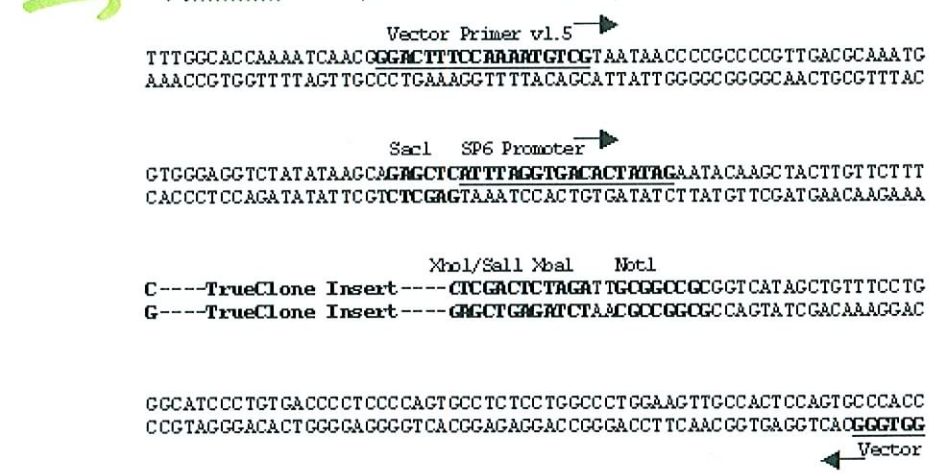
Polylinker Sequence of pCMV6-XL4, XL5 and XL6

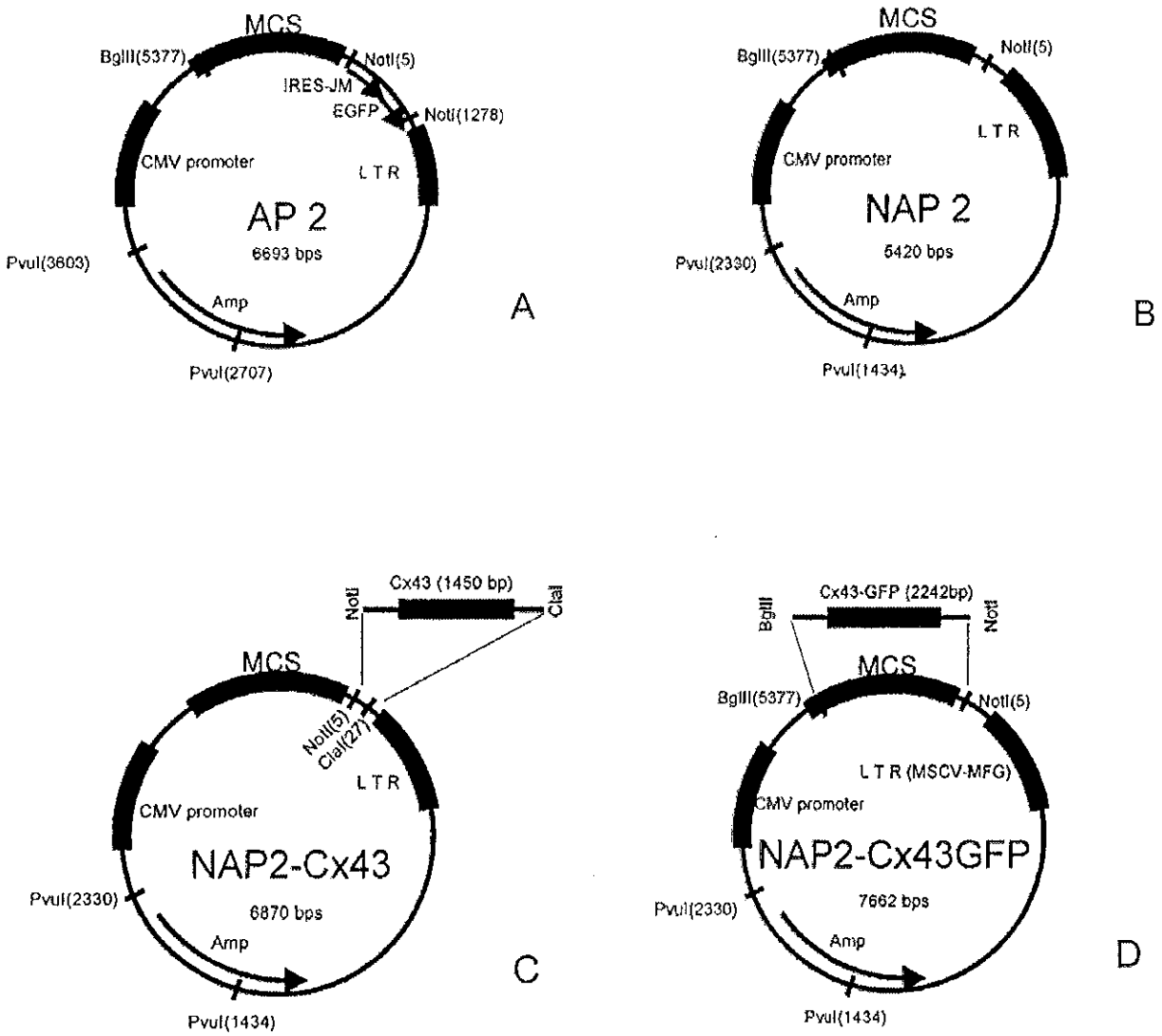
A) pCMV6-XL4 and XL5 (EcoR1--Xho1/Sal1)



B) pCMV6-XL6 (EcoR1--Xho1/Sal1)



Retroviral vectors



Mao A J et al. J. Biol. Chem. 2000;275:34407-34414