[redacted]

Approved Personnel
(Please stroke out any personnel to be removed)

Additional Personnel Torchia
(Please list additional personnel here)

	Please stroke out any approved Biohazards to be removed below	Write additional Biohazards for approval below. *
Approved Microorganisms	E. Coli OH5 alpha, BL21	E. coli bacteria with plasmids. (DH5α)
Approved Cells	Human (established), He La, MCF7, HaCAT, 293T, NIH3T3, T470, Rodent (established), pig, RAT-1, EP64, MEF, C2C12	
Approved Use of Human Source Material		
Approved GMO	Sv 40 Large T antigen, E1A oncogene, Adenovirus Dual-GGM	plasmid DNA
Approved use of Animals		
Approved Toxin(s)		

* *PLEASE ATTACH A MATERIAL SAFETY DATA SHEET OR EQUIVALENT FOR NEW BIOHAZARDS.*
** *PLEASE ATTACH A BRIEF DESCRIPTION OF THE WORK THAT EXPLAINS THE BIOHAZARDS USED AND HOW THEY WILL BE USED.*

Classification: 2

Date of last Biohazardous Agents Registry Form: Oct 2, 2007

Signature of Permit Holder: [signature]

BioSafety Officer(s): Gail Ryder July 30/09

Chair, Biohazards Subcommittee: _____

RE: Biohazard useage Addgene order#27586

The plasmids contain cDNA which can reprogram specific gene pathways in cell culture only. The plasmid DNA will be introduced into fibroblast cells in culture by transient transfection and after 72 hr the cells will be examined for changes in cell growth, morphology and changes in the expression of specific markers to determine if developmental pathways has been altered in any way.

PB-CA-rtTA AdV
PB-TET
PB-TET-MKOS
PB-CA

Plasmid 20910: PB-CA-rtTA Adv

Gene/insert name:	rtTA-ON-Adv
Insert size (bp):	754
Species of gene(s):	Other
Vector backbone:	PB-CA (Search Vector Database)
Type of vector:	Mammalian expression
Backbone size (bp):	6262
Cloning site 5':	attB1
Site destroyed during cloning:	No
Cloning site 3':	attB2
Site destroyed during cloning:	No
5' Sequencing primer:	M13 R, T3 (List of Sequencing Primers)
3' Sequencing primer:	M13F, T7
Bacteria resistance:	Ampicillin
High or low copy:	High Copy
Grow in standard E. coli @ 37C:	Yes
If you **did not originally clone** this gene, from whom and where did you receive the plasmid used to derive this plasmid:	piggyBac terminal repeats obtained from Pentao Liu at Sanger, CAG-rtTA Advanced obtained from Clontech.
Sequence:	View sequence
Author's Map:	View map

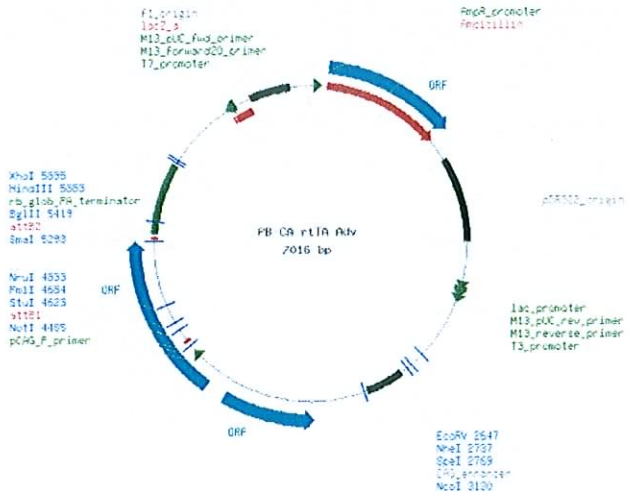
Plasmid Provided In:	DH5a
Principal Investigator:	Andras Nagy
Terms and Licenses:	MTA

Comments: Any PB vector has to have the PBase vector to 'piggyBac transpose' the construct into the genome. You can get this vector, named pCyL43, from the Sanger institute's plasmid repository at http://www.sanger.ac.uk/technology/clonerequests/

There is an Sanger MTA that must be signed and is available on their website.

Addgene has sequenced a portion of this plasmid for verification. Click here for the sequencing result.

Click on map to enlarge



Selected features		Unique restriction sites	
AmpR_promoter	62 - 90	EcoRV	2647
ORF frame 3	132 - 992	NheI	2737
Ampicillin	132 - 992	SpeI	2769
pBR322_origin	1147 - 1766	NcoI	3130
lac_promoter	2075 - 2104	NotI	4485
M13_pUC_rev_primer	2118 - 2140	StuI	4623

M13_reverse_primer	2139 - 2157	PmlI	4684
T3_promoter	2174 - 2193	NruI	4833
CAG_enhancer	2835 - 3122	SmaI	5293
ORF frame 2	4102 - 3494	BglII	5419
pCAG_F_primer	4437 - 4456	HindIII	5883
attB1	4523 - 4547	XhoI	5895
ORF frame 2	4241 - 5299		
attB2	5302 - 5326		
rb_glob_PA_terminator	5342 - 5855		
T7_promoter	6391 - 6373		
M13_forward20_primer	6414 - 6398		
M13_pUC_fwd_primer	6429 - 6407		
lacZ_a	6395 - 6550		
f1_origin	6576 - 6882		

Article: piggyBac transposition reprograms fibroblasts to induced pluripotent stem cells. Woltjen K et al. (Nature. 2009 Mar 1. ():. 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 20910" in your Materials and Methods section. This information allows Addgene to create a link from the plasmid page to your publication.

Plasmid 20909: PB-TET

Gene/insert name:	Gateway Destination Vector
Insert size (bp):	1455
Fusion proteins or tags:	IRES-bGeo
Terminal:	C terminal on backbone
Vector backbone:	pBluescript KS (Search Vector Database)
Type of vector:	Mammalian expression
Backbone size (bp):	9370
Cloning site 5':	AttR1
Site destroyed during cloning:	No
Cloning site 3':	AttR2
Site destroyed during cloning:	No
5' Sequencing primer:	M13 F, T7 (List of Sequencing Primers)
3' Sequencing primer:	M13 R, T3
Bacteria resistance:	Ampicillin
High or low copy:	High Copy
Grow in standard E. coli @ 37C:	No
Please specify bacterial strain for growth and growth condition:	ccdB survival cells
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:	piggyBac terminal repeats obtained from Pentao Liu at Sanger.

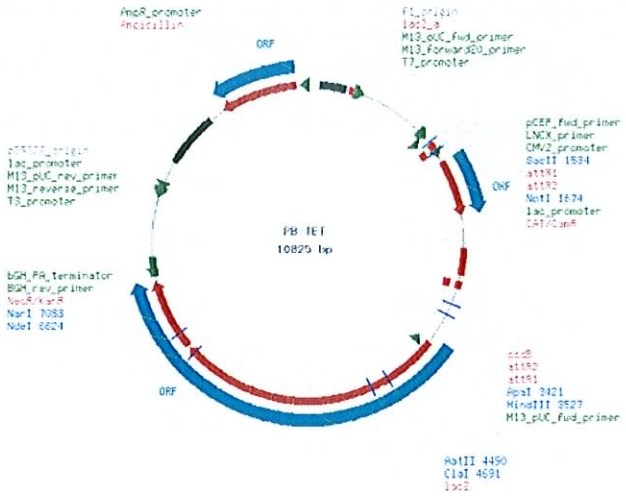
Sequence:	View sequence
Author's Map:	View map
Plasmid Provided In:	ccdB Survival
Principal Investigator:	Andras Nagy
Terms and Licenses:	MTA

Comments: Any PB vector has to have the PBase vector to 'piggyBac transpose' the construct into the genome. You can get this vector, named pCyL43, from the Sanger institute's plasmid repository at http://www.sanger.ac.uk/technology/clonerequests/

There is an Sanger MTA that must be signed and is available on their website.

Addgene has sequenced a portion of this plasmid for verification. Click here for the sequencing result.

Click on map to enlarge



Selected features		Unique restriction sites	
f1_origin	441 - 135	SacII	1534
lacZ_a	622 - 474	NotI	1674
M13_pUC_fwd_primer	588 - 610	ApaI	3421
M13_forward20_primer	603 - 619	HindIII	3527
T7_promoter	626 - 644	AatII	4490
pCEP_fwd_primer	1442 - 1461	ClaI	4691

LNCX_primer	1444 - 1468	NdeI	6824
CMV2_promoter	1435 - 1530	NarI	7083
attR1	1548 - 1672		
attR2	1672 - 1572		
lac_promoter	1697 - 1720		
ORF frame 2	1781 - 2440		
CAT/CamR	1781 - 2440		
ccdB	2782 - 3087		
attR2	3128 - 3228		
attR1	3235 - 3128		
M13_pUC_fwd_primer	3904 - 3882		
lacZ	3880 - 6915		
ORF frame 1	3799 - 7749		
NeoR/KanR	6946 - 7746		
BGH_rev_primer	7798 - 7781		
bGH_PA_terminator	7784 - 8011		
T3_promoter	8652 - 8633		
M13_reverse_primer	8687 - 8669		
M13_pUC_rev_primer	8708 - 8686		
lac_promoter	8751 - 8722		
pBR322_origin	9679 - 9060		
ORF frame 3	10694 - 9834		
Ampicillin	10694 - 9834		
AmpR_promoter	10764 - 10736		

Article: piggyBac transposition reprograms fibroblasts to induced pluripotent stem cells. Woltjen K et al. (Nature. 2009 Mar 1. ():. Pubmed)

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

Plasmid 20959: PB-TET-MKOS

Gene/insert name:	cMyc, KLF4, Oct4, Sox2
Insert size (bp):	5046
Species of gene(s):	M. musculus (mouse)
Fusion proteins or tags:	IRES-bGeo
Terminal:	C terminal on backbone
Vector backbone:	PB-TET (Search Vector Database)
Type of vector:	Mammalian expression
Backbone size (bp):	9186
Cloning site 5':	attB1
Site destroyed during cloning:	No
Cloning site 3':	attB2
Site destroyed during cloning:	No
5' Sequencing primer:	M13 F, T7 (List of Sequencing Primers)
3' Sequencing primer:	M13 R, T3
Bacteria resistance:	Ampicillin
High or low copy:	High Copy
Grow 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	MKOS liked by 2A peptides obtained from Keisuke Kaji et al (Nature. 2009 Mar 1) piggyBac terminal repeats obtained from

Addgene - PB-TET-MKOS Plasmid Data http://www.addgene.org/pgvec1?f=c&identifier=20959&atqx=pb-%20tet&cmd=findpl

plasmid:	Pentao Liu at Sanger.
Sequence:	View sequence
Author's Map:	View map
Plasmid Provided In:	DH5a
Principal Investigator:	Andras Nagy
Terms and Licenses:	MTA

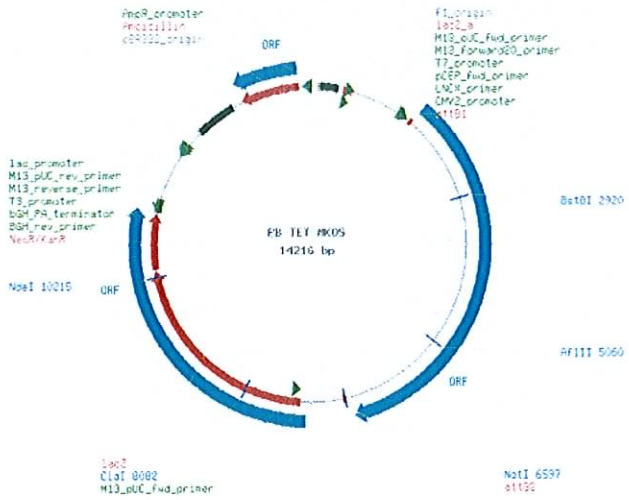
Comments: Additional reference, Kaji et al Nature. 2009 Mar 1.

Any PB vector has to have the PBase vector to 'piggyBac transpose' the construct into the genome. You can get this vector, named pCyL43, from the Sanger institute's plasmid repository at http://www.sanger.ac.uk/technology/clonerequests/

There is an Sanger MTA that must be signed and is available on their website.

Addgene has sequenced a portion of this plasmid for verification. Click here for the sequencing result.

Click on map to enlarge



Selected features

f1_origin	441 - 135
lacZ_a	622 - 474
M13_pUC_fwd_primer	588 - 610
M13_forward20_primer	603 - 619
T7_promoter	626 - 644
pCEP_fwd_primer	1442 - 1461

Unique restriction sites

BstBI	2920
AflII	5060
NotI	6597
ClaI	8082
NdeI	10215

Addgene - PB-TET-MKOS Plasmid Data http://www.addgene.org/pgvec1?f=c&identifier=20959&atqx=pb-%20tet&cmd=findpl

LNCX_primer	1444 - 1468
CMV2_promoter	1435 - 1530
attB1	1548 - 1572
ORF frame 2	1619 - 6589
attB2	6619 - 6643
M13_pUC_fwd_primer	7295 - 7273
lacZ	7271 - 10306
ORF frame 2	7190 - 11140
NeoR/KanR	10337 - 11137
BGH_rev_primer	11189 - 11172
bGH_PA_terminator	11175 - 11402
T3_promoter	12043 - 12024
M13_reverse_primer	12078 - 12060
M13_pUC_rev_primer	12099 - 12077
lac_promoter	12142 - 12113
pBR322_origin	13070 - 12451
ORF frame 1	14085 - 13225
Ampicillin	14085 - 13225
AmpR_promoter	14155 - 14127

Article: piggyBac transposition reprograms fibroblasts to induced pluripotent stem cells. Woltjen K et al. (Nature. 2009 Mar 1. ():. 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 20959" in your Materials and Methods section. This information allows Addgene to create a link from the plasmid page to your publication.

Plasmid 20960: PB-CA

Gene/insert name:	Gateway Destination Vector
Insert size (bp):	1452
Vector backbone:	PB-CA (Search Vector Database)
Type of vector:	Mammalian expression
Backbone size (bp):	6465
Cloning site 5':	attR1
Site destroyed during cloning:	No
Cloning site 3':	attR2
Site destroyed during cloning:	No
5' Sequencing primer:	M13 R, T3 (List of Sequencing Primers)
3' Sequencing primer:	M13F, T7
Bacteria resistance:	Ampicillin
High or low copy:	High Copy
Grow in standard E. coli @ 37C:	No
Please specify bacterial strain for growth and growth condition:	ccdB survival cells
If you **did not originally clone** this gene, from whom and where did you receive the plasmid used to derive this plasmid:	piggyBac terminal repeats obtained from Pentao Liu at Sanger
Sequence:	View sequence

Addgene - PB-CA Plasmid Data http://www.addgene.org/pgvec1?f=c&identifier=20960&atqx=pb-%20ca&cmd=findpl

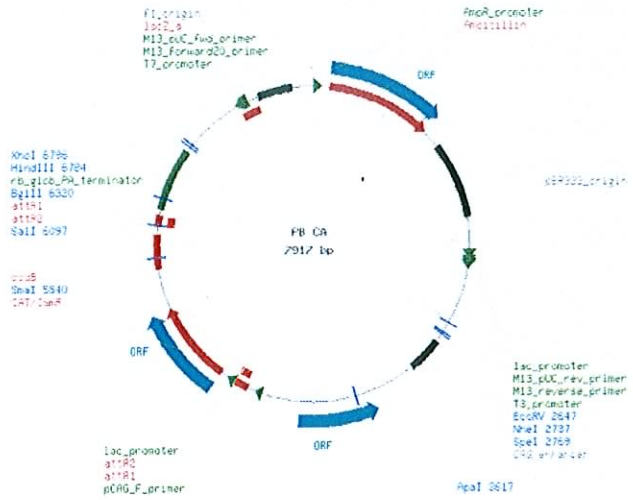
Author's Map:	View map
Plasmid Provided In:	ccdB Survival
Principal Investigator:	Andras Nagy
Terms and Licenses:	MTA

Comments: Any PB vector has to have the PBase vector to 'piggyBac transpose' the construct into the genome. You can get this vector, named pCyL43, from the Sanger institute's plasmid repository at http://www.sanger.ac.uk/technology/clonerequests/

There is an Sanger MTA that must be signed and is available on their website.

Addgene has sequenced a portion of this plasmid for verification. Click here for the sequencing result.

Click on map to enlarge



Selected features	
AmpR_promoter	62 - 90
ORF frame 3	132 - 992
Ampicillin	132 - 992
pBR322_origin	1147 - 1766
lac_promoter	2075 - 2104
M13_pUC_rev_primer	2118 - 2140

Unique restriction sites	
EcoRV	2647
NheI	2737
SpeI	2769
ApaI	3617
SmaI	5840
SalI	6097

M13_reverse_primer	2139 - 2157	BglII	6320
T3_promoter	2174 - 2193	HindIII	6784
CAG_enhancer	2835 - 3122	XhoI	6796
ORF frame 2	4102 - 3494		
pCAG_F_primer	4437 - 4456		
attR1	4523 - 4647		
attR2	4647 - 4547		
lac_promoter	4672 - 4695		
ORF frame 1	4756 - 5415		
CAT/CamR	4756 - 5415		
ccdB	5757 - 6062		
attR2	6103 - 6203		
attR1	6210 - 6103		
rb_glob_PA_terminator	6243 - 6756		
T7_promoter	7292 - 7274		
M13_forward20_primer	7315 - 7299		
M13_pUC_fwd_primer	7330 - 7308		
lacZ_a	7296 - 7451		
f1_origin	7477 - 7783		

Article: piggyBac transposition reprograms fibroblasts to induced pluripotent stem cells. Woltjen K et al. (Nature. 2009 Mar 1. ():. 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 20960" in your Materials and Methods section. This information allows Addgene to create a link from the plasmid page to your publication.

addgene

One Kendall Square, Building 600 3rd Flr, Cambridge, MA 02139
info@addgene.org • Tel: 617-225-9000 • Fax: 888-734-0533

MATERIAL SAFETY DATA SHEET
E. coli bacteria with plasmids

Last Updated: 03/10/2006
Version 1.02

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	**E. coli bacteria with plasmids**
COMPANY:	**Addgene**
STREET ADDRESS:	**One Kendall Square, Building 600, 3rd Floor**
CITY, STATE, ZIP, COUNTRY:	**Cambridge, MA 02139 US**
TELEPHONE:	**(617) 225-9000**
FAX:	**(888) 734-0533**
PRODUCT USE:	For laboratory research use only.

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE:	E. coli bacteria
CAS NO.	None
SARA 313 REPORTABLE	No

SECTION 3: HAZARDS IDENTIFICATION

ROUTES OF ENTRY:	**Skin or eye contact**
POTENTIAL HEALTH EFFECTS	
EYES:	**May cause irritation of the eye**
SKIN:	**May cause irritation of the skin.**
INGESTION:	**May cause nausea or vomiting.**
INHALATION:	**No toxicity expected from inhalation.**
CARCINOGENICITY	**Not listed by OSHA, IARC, or NTP**

SECTION 4: FIRST AID MEASURES

EYES:	**Rinse opened eyes for at least 15 minutes. If eyes become irritated, get medical attention.**
SKIN:	**Wash skin with soap and water.**
INGESTION:	**Rinse mouth. If irritation or symptoms occur, get medical attention.**
INHALATION:	**Find fresh air. If symptoms occur, get medical attention.**

SECTION 5: FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA:	**Water, carbon dioxide, dry chemical powder, or foam**
SPECIAL PROCEDURES:	**Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.**

SECTION 6: ACCIDENTAL RELEASE MEASURES

ENVIRONMENTAL PRECAUTIONS: Keep out of sewers and waterways.

CLEAN-UP METHODS: Clean spills with chlorine bleach or 70% ethanol. Autoclave materials and dispose of waste in accordance with federal, state, and local safety regulations.

SECTION 7: HANDLING AND STORAGE

HANDLING: Avoid inhalation and contact with eyes, skin, and clothing.

STORAGE: Store at 4°C. Create frozen stocks for long-term storage.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Safety shower and eye bath

VENTILATION : General ventilation

RESPIRATORY PROTECTION: Not required

EYE PROTECTION: Safety goggles

SKIN PROTECTION: Protective gloves

WORK HYGIENIC PRACTICES: Use safe laboratory practices. Handle as biohazard material.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

FORM: Bacteria supplied in glass vial with LB agar.

ODOR: Odorless

COLOR: Colorless

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: None known

MATERIALS TO AVOID: None known

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: None known

HAZARDOUS POLYMERIZATION: None

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION: May be irritating to eyes and skin.

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: No data.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD:	Observe all federal, state, and local laws and regulations.
RCRA HAZARD CLASS:	Not applicable.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS:	Non-hazardous
WATER TRANSPORTATION HAZARD CLASS:	Non-hazardous
AIR TRANSPORTATION HAZARD CLASS:	Non-hazardous

SECTION 15: REGULATORY INFORMATION

OSHA REGULATORY STATUS (29 CFR 1910.1200)	Irritant
TSCA:	No specific regulations
CERCLA:	None
SARA TITLE III:	None
SARA 311/312 HAZARD CATEGORIES:	None
SARA 313 REPORTABLE INGREDIENTS:	None
STATE REGULATIONS:	N/A

SECTION 16: OTHER INFORMATION

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

The above information is correct to the best of our knowledge, but does not purport to be all inclusive and shall be used only as a guide. Addgene shall not be held liable for any damage resulting from handling or from contact with the above product.

519-661-3020

B10-LRCC-0005

THE UNIVERSITY OF WESTERN ONTARIO
BIOHAZARDOUS AGENTS REGISTRY FORM
Revised Biohazards Subcommittee: January, 2007

This form must be completed by each Principal Investigator holding a grant administered by the University of Western Ontario where the use of biohazardous infectious agents are described in the experimental work proposed. The form must also be completed if animal work is proposed involving the use of biohazardous agents or animal carrying zoonotic agents infectious to humans. Containment Levels will be required in accordance with Laboratory Biosafety Guidelines, 3rd edition, 2004, Health Canada (HC) 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 (Stevenson-Lawson Building, Room 60) for forward to the Biohazard Subcommittee. For questions regarding this form, please contact the Biosafety Coordinator at extension 81136. If there are changes to the information on this form (excluding grant title and funding agencies) modifications must be completed and sent to Occupational Health and Safety. See website: www.uwo.ca/humanresources

PRINCIPAL INVESTIGATOR Joseph Torchia
SIGNATURE
DEPARTMENT Oncology, Cancer Research Labs, LRCP
ADDRESS 790 Commissioners Rd E., Room A4-915
PHONE NUMBER 519-685-8692
EMAIL jtorchia@uwo.ca

Location of experimental work to be carried out: Building(s) LRCP Room(s) A4-915, A4-910, A4-911, A4-917

*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 it being sent to Occupational Health and Safety (See Section 12.0, Approvals). For research being done at Lawson Health Research Institute, London Regional Cancer Centre, Child and Parent Research Institute or Roberts Research Institute, University Biosafety Committee members can also sign as the Safety Officer.

TITLE OF GRANT(S):
The role of the ZNF217 oncoprotein in gene regulation and cancer

PLEASE ATTACH A BRIEF DESCRIPTION OF YOUR WORK, SUCH A THE RESEARCH GRANT SUMMARY(S) THAT EXPLAINS THE BIOHAZARDS USED. PROJECTS SUBMITTED WITHOUT A SUMMARY WILL NOT BE REVIEWED.

FUNDING AGENCY/AGENCIES Canadian Institute of Cancer Research (CIHR)

Names of all personnel working under Principal Investigators supervision in this location:
i) Majdina Isovic
ii) Hina Naeem
iii) Gobi Thillainadesan
iv)
v)

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

1.0 Microorganisms

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

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?
E.coli (DH5α BL21)	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	1 litre
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

1.3 For above named organism(s) or biological agent(s) circle HC or CFIA Containment Level required. (1) 2 3

1.4 Source of microrganism(s) or biological agent(s)? Frozen Stock

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 (ie. derived from fresh tissue) that will be grown in culture in the table below

Cell Type	Is this cell type used in your work?	Source of Primary Cell Culture Tissue
Human	☐ Yes ☐ No	
Rodent	☐ Yes ☐ No	
Non-human primate	☐ Yes ☐ No	
Other (specify)		

N/A

2.3 Please indicate the type of established cells that will be grown in culture in the table below.

Cell Type	Is this cell type used in your work?	Specific cell line(s)	Supplier / Source
Human	☐ Yes ☐ No	He La, MCF7, HaCAT 293T, NIH3T3, T470	ATCC
Rodent	☐ Yes ☐ No	pig, RAT-1, EPH4, MEF 3T3	ATCC
Non-human primate	☐ Yes ☐ No		
Other (specify)	☐ Yes ☐ No		

2.4 For above named cell types(s) circle HC or CFIA containment level required 1 (2) 3

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

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 if the following will be used in the laboratory

- Human blood (whole) or other bodily fluids ☐ YES ☐ NO If YES, Specify _____
- Human blood (fraction) or other bodily fluids ☐ YES ☐ NO If YES, Specify _____
- Human organs (unpreserved) ☐ YES ☐ NO If YES, Specify _____
- Human tissues (unpreserved) ☐ YES ☐ NO If YES, Specify _____

3.3 Is human source known to be infected with and infectious agent ☐ YES ☐ NO
If YES , please name infectious agent _____

3.4 For above named materials circle HC or CFIA containment level required. 1 2 3

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 sequences from the following be involved:

- HIV ☐ YES ☐ NO
if YES specify _____
- HTLV 1 or 2 or genes from any CDC class 1 pathogens ☐ YES ☐ NO
if YES specify _____
- Other human or animal pathogen and or their toxins ☐ YES ☐ NO
if YES specify _____

4.3 Will intact genetic sequences be used from

- SV 40 Large T antigen ☒ YES ☐ NO If YES specify 293T contains the SV40 large T antigen
- Known oncogenes ☑ YES ☐ NO If YES specify E1A

4.4 Will a live vector(s) (viral or bacterial) be used for gene transduction ☒ YES ☐ NO
If YES name virus Adenovirus

4.5 List specific vector(s) to be used: Dual - GSM

4.6 Will virus be replication defective ☒ YES ☐ NO

4.7 Will virus be infectious to humans or animals ☐ YES ☒ NO

4.8 Will this be expected to increase the Containment Level required ☐ YES ☒ NO

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

5.0 Human Gene Therapy Trials

5.1 Will human clinical trials using the viral vector in 4.0 be conducted? ☐ YES ☒ NO
If no, please proceed to Section 6.0
If YES attach a full description of the make-up of the virus.

5.2 Will virus be able to replicate in the host? ☐ YES ☐ NO

5.3 How will the virus be administered? _____

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

5.5 Has human ethics approval been obtained? ☐ YES ☐ NO

6.0 Animal Experiments

6.1 Will any of the agents listed be used in live animals? ☐ YES ☒ NO
If no, please proceed to section 7.0

6.2 Name of animal species to be used _____

6.3 AUS protocol # _____

6.4 If using murine cell lines, have they been tested for murine pathogens? ☐ YES ☐ NO

7.0 Use of Animal species with Zoonotic Hazards

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

- Pound source dogs ☐ YES ☒ NO
- Pound source cats ☐ YES ☒ NO
- Sheep or goats ☐ YES ☒ NO
- Non- Human Primates ☐ YES ☒ NO If YES specify species _____
- Wild caught animals ☐ YES ☒ NO If YES specify species _____
  colony # _____

8.0 Biological Toxins

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

8.2 If YES, please name the toxin _____

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

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

N/A

9.0 Import Requirements

9.1 Will the agent be imported? ☐ YES ☐ NO
If no, please proceed to Section 10.0
If yes, country of origin _____

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

9.3 Has an import permit been obtained from CFIA for animal patnogens? ☐ YES ☐ NO

9.4 Has the import permit been sent to OHS? ☐ YES ☐ NO
If yes, Permit # _____

10.0 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

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

SIGNATURE _____

11.0 Containment Levels

11.1 For the work described in sections 1.0 to 9.0, please circle the highest HC or CFIA Containment Level required. 1 (2) 3

11.2 Has the facility been certified by OHS for this level of containment? X YES ☐ NO

11.3 If yes, please give the date and permit number: AS PER DAVE GRIFFITH 07/08/17

12.0 Approvals

6 M. Kidder 2 Oct, 2007
UWO Biohazard Subcommittee

Signature _____ Date Aug 7, 2007.

Safety Officer for Institution where experiments will take place

Signature _____ Date August 17, 2007

Safety Officer for University of Western Ontario (if different than above)

Signature Stanley Date Sept 28/07

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

Joseph Torchia

Operating Grants/Subventions de fonctionnement Application/Demande 2007-03-01

Summary of Research Proposal/Résumé de la proposition de recherche

Cancer is a disease involving aberrant cell growth in which the normal control of cell proliferation and division are disrupted. Many proteins that give rise to cancer play an essential role in processes that controls the cells ability to undergo cell division and multiplication. However, when these proteins are mutated, inactivated or amplified, normal growth patterns may be disrupted which could have devastating consequences to the organism. The research in my lab is dedicated to identifying and understanding how specific proteins contribute to the development of cancer. We are focusing our efforts on the analysis of proteins that regulate transcriptional response programs. ZNF217 is a candidate oncogene that is amplified and overexpressed in multiple cancer cell lines and tumours and recent evidence indicates that ZNF217 overproduction results in abnormal cell growth. **The hypothesis behind the proposed research is that deregulated expression of the ZNF217 transcription factor promotes the development of cancer by causing aberrant transcriptional silencing of specific target genes.** This hypothesis is based on the following observations: First, ZNF217 is found within a narrow region of recurrent maximal amplification that is devoid of other transcribed genes. Secondly, we and others have shown that ZNF217 is a major constituent of a transcriptional complex containing chromatin-modifying activities known to promote transcriptional repression. Thirdly, we have identified a consensus recognition sequence suggesting that ZNF217 has DNA binding activity. Fourth, we are combining (1) genome wide expression profiling of cancer cells in which ZNF217 has been downregulated using siRNA and (2) chromatin immunoprecipitation (ChIP) in conjunction with a novel technique, known as DNA selection and ligation (ChIP-DSL), to identify genes directly regulated by ZNF217. Importantly, we have identified and validated the first known targets of the human ZNF217 complex, several of which play a direct role in tumour biology. As part of our long term goals to understand how defects in gene expression pathways contribute to tumourigenesis, the specific objectives of this application are designed to define the role of ZNF217 in transcriptional regulation, as well as explore potential functions that may be relevant to aberrant cell proliferation and cancer.

Specific Aim 1: We will identify and characterize the cohort of genes that are directly regulated by ZNF217. We are using ChIP, in combination with expression array screening to identify signature genes directly regulated by ZNF217. This information will be used to reveal the physiologic events regulated by ZNF217 that are relevant to cancer.

Specific Aim 2: Characterize the mechanism (s) of transcriptional silencing of p15ink4B. We will characterize the mechanism of transcriptional silencing of the p15ink4b tumour suppressor gene by the ZNF217 complex and identify the role of ZNF217 in cell cycle progression.

Specific Aim 3: Establish an in vivo mouse model to assess the effects of ZNF217 overexpression in mouse mammary gland physiology and tumour development. We will generate transgenic mice that overexpress ZNF217 in the mouse mammary gland and assess the effects of varying levels of ZNF217 expression on mammary gland physiology and tumour development.

Significance

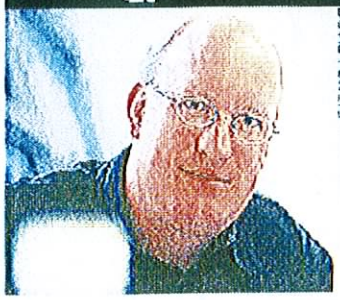
In spite of its potential importance in cellular transformation, little is known of ZNF217 function. The experiments outlined in this proposal will provide a better understanding of the gene expression programs controlled by ZNF217, in order to better define the contribution of this transcriptional regulator to the etiology of breast cancer

----- Original Message --------
Subject: Re: Biohazardous agents registry form
Date: Fri, 21 Sep 2007 14:35:39 -0500
From: Joseph Torchia <jtorchia@uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>
References: <4.3.2.7.2.20070906231547.02a5a4e0@imap.uwo.ca>
<46F41A41.2040806@uwo.ca>

The name of the protein is ZNF217. It is a transcription factor involved in gene regulation

----- Original Message -----
From: Jennifer Stanley <jstanle2@uwo.ca>
Date: Friday, September 21, 2007 2:23 pm
Subject: Biohazardous agents registry form
To: "Dr. Joe Torchia" <jtorchia@uwo.ca>

> Thanks for the information, Dr. Torchia.
>
> What is the name of the protein being expressed by the cell
> lines? What
> is the function of the protein?
>
> Jennifer
>
>
>
> Dr. Joe Torchia wrote:
>
> >
> > The adenoviral vector is a putative oncogene. It is not known
> with
> > certainty. We will be using HaCAT (human keratnocytes) and
> MCF10
> > (human mammary gland) cell lines to overexpress this protein.
> >



HOME

TABLE OF CONTENTS

ABOUT UCSF MAGAZINE

EDITORIAL BOX

SEARCH GO

C is for Cancer and Colin Collins

Cancer cells often possess many more genetic abnormalities than are absolutely necessary for their survival, progression and metastasis. Upon close scrutiny, the genetic fingerprints of a tumor may differ markedly not only from the genetic fingerprints seen in normal human cells, but also from those found in another individual with the same type of tumor.

The challenge for cancer researchers: first, to identify which changes in the genetic program are common and important to tumors and second, to develop molecular markers to better classify tumors, select appropriate therapies, and design clinical trials. Ultimately, some of the genetic changes identified should lead to gene targets and new treatments.

After nearly a decade of sleuthing, UCSF Comprehensive Cancer Center molecular geneticist Colin Collins has identified such a target — a previously unknown and unsuspected gene, named ZNF217. In many breast tumors, there are too many copies of the ZNF217 gene, which leads to too much production of the ZNF217 protein.

This gene "amplification" is associated with a reduced likelihood of surviving after surgery because the breast cancer eventually recurs. In addition, Collins has discovered that the insertion and activation of ZNF217 genes in normal mammary cells growing in culture can cause them to become immortal — basically, they ignore signals telling them to remain in a non-proliferating state. Immortalization is thought to be a key cellular event in the evolution of cancer.

Collins has found that ZNF217 might in some cases be responsible when tumors become resistant to a chemotherapy drug, doxorubicin, commonly used to treat breast cancer.

Collins also determined that cancer cells that overproduce the ZNF217 protein acquire greater resistance to the drug than cancer cells making normal amounts of the protein. He now is developing molecular strategies for blocking ZNF217 function and increasing the effectiveness of anti-cancer therapies such as doxorubicin.

In related work, Collins and computer scientist Stanislav Volik recently developed a new technique for rapidly identifying and cloning regions of DNA within the human

Photo: Molecular geneticist Colin Collins.

genome that are amplified, deleted, turned around or moved out of place within tumor cells.

Using the technique, called end-sequence profiling (ESP), speeds up the identification of important genes such as ZNF217. This is because ESP makes it possible to link changes in gene activity and protein production with particular instances of genomic damage, such as specific amplifications, to clinical outcome.

by Jeffrey Norris