The University *of* Western Ontario
BIOLOGICAL AGENTS REGISTRY FORM
Approved Biohazards Subcommittee: April 8, 2011
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).

Electronically 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:	**Susan F. Koval**
DEPARTMENT:	**Microbiology and Immunology**
ADDRESS:	**Dental Sciences Building, Room 3013A**
PHONE NUMBER:	**519-661-3439**
EMERGENCY PHONE NUMBER(S):	**519-439-5349**
EMAIL:	**skoval@uwo.ca**

Location of experimental work to be carried out:

Building:	**Dental Sciences**	Room(s):	**3013, 3004E**
Building:		Room(s):	
Building:		Room(s):	

*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: **NSERC**

GRANT TITLE(S): **Predatory prokaryotes: life cycle and non-culture methods of identification**

UNDERGRADUATE COURSE NAME(IF APPLICABLE):

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

Name	UWO E-mail Address	Date of Biosafety Training
Ryan Chanyi	**rchanyi@uwo.ca**	**September 2008**
Judy Sholdice	**jsholdic@uwo.ca**	**July 2005**

Please explain how the biological agents are used in your project and how they are stored and disposed of. The BARF without this description will not be reviewed.

Predatory prokaryotes are usually grown in liquid cocultures with prey cells. We routinely use 125 or 250 ml cocultures. To obtain predator cells devoid of residual prey cells (usually for isolation of DNA), we prepare up to 1 litre of cocultures. In some experiments (isolation of new predators or enumeration of predators) double layer agar plates are used and plaques obtained.

The prokaryotic predators we study are often referred to as 'Bdellovibrio and like organisms' (BALOs). This is because the first such predator to be described was assigned to the genus and species Bdellovibrio bacteriovorus (in 1963). Since then there have been other isolates and taxonomic changes. We routinely use well-characterized strains of Bdellovibrio bacteriovorus for our studies on the life cycle. We sometimes use other BALOs for comparative purposes (Peredibacter starrii or Bacteriolyticum stolpii). We also isolate new predators from environmental samples (sewage, compost, soil).

The well-characterized strains of Bdellovibrio bacteriovorus are grown on BSL 1 strains of prey cells (E. coli ML35, Caulobacter cresentus CB2A, Aquaspirillum serpens VHL). For analysis of the prey range of BALOs, we have isolated Gram-negative bacteria from sewage in London, ON. These isolates have not been taxonomically identified past an analysis of 16S rRNA sequence homology, but may be BSL 2 strains. They are handled according to guidelines for BSL 2 organisms. In our lab culture collection we have an assortment of other Gram-negative bacteria that have been used as prey cells, depending upon the research objectives at that point in time, but they are not routinely used. These include various phytopathogenic bacteria (obtained from Agriculture and Agri-food Canada), and a panel of the Burkholderia cepacia complex strains (obtained from M. Valvano).

Bacterial cultures are stored frozen at - 80C in glycerol.

All cocultures are prepared in glassware and are disposed of by autoclaving. Centrifuge tubes are incubated with 10% bleach for 15 minutes and rinsed with water. Agar cultures in glass petri dishes are autoclaved and the dishes subsequently washed and resterilized. Plastic petri dishes with cultures are autoclaved prior to disposal as waste, in the department wash-up and autoclave facility.

Our genetic modification studies involve inactivation of genes in BALOs that may potentially be involved in attachment and invasion of the predator. For these purposes we use an in-frame markerless deletion mutation method. A portion of a gene of interest is amplified from the BALO genome such that central areas of the gene have been deleted. The modified gene fragment is ligated into the suicide vector pSSK10. The resulting plasmid is transferred into E. coli SM10 lambda pir using electroporation. Then via conjugation the plasmid is transferred into B. bacteriovorus and recipients selected on agar plates containing appropriate antibiotics. The mutants are analyzed for their ability to attach and invade prey cells.

For another project, we have made a transposon mutagenesis library of E. coli ML35, using the plasposon pTnMod-RTp. This plasposon is first transferred into E. coli SM10lambda pir by electroporation and then into E. coli ML35 via conjugation. Exconjugants are selected on LB agar plates with trimethoprim. Transposon mutants are then screened for their inability to be used as a prey cell by B. bacteriovorus.

Please include a ONE page research summary or teaching protocol in lay terms.
Forms with summaries more than one page will not be reviewed.

Unique among microorganisms are small, highly motile bacteria called bdellovibrios, which attack and lyse a wide variety of other bacteria. These predatory prokaryotes are important components in the control of bacterial populations (both free-living and pathogenic species) in various ecosystems. The life cycle of the bdellovibrios alternates between an extracellular, flagellated, nongrowing phase and an intracellular, nonflagellated, periplasmic growth phase. Among the initial requirements for successful predation are (i) location of a prey cell, (ii) attachment to the prey cell surface and (iii) penetration and invasion through the prey cell wall into the periplasm. Recently, our lab isolated predatory bdellovibrios with an alternate life cycle. These predators do not enter the periplasm of the prey cell, but remain attached outside at the cell surface during predation.

Our current research objectives are: (1) to determine the components of predator and prey surfaces that dictate attachment and penetration; (2) to characterize the life cycle of epibiotic predators and compare it with the details of the periplasmic life cycle that have been investigated. Our studies will contribute towards an understanding of the dynamics of microbial populations in freshwater and terrestrial environments. If we understand the mechanism of invasion of bacteria by these predators, we can develop their use as biocontrol agents in specific environmental niches.

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:

Full Scientific 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
Aquaspirillum serpens	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**1 litre**	**lab culture collection**	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Bdellovibrio bacteriovorus	☒ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**1 litre**	**lab culture collection**	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Caulobacter crescentus	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**1 litre**	**lab culture collection**	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Escherichia coli	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**1 litre**	**lab culture collection**	☒ 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		
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)*	Containment Level of each cell line	Supplier / Source of cell line(s)
Human	☐ Yes ☐ No			
Rodent	☐ Yes ☐ No			
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/UNKNOWN**	**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	Will there be a change due to transformation of the bacteria?	What is the consequence of transfected or transduced genes in eukaryotic cells?
E. coli DH5alpha	**pSSK10**	**S. Pineiro**	**type IV pili genes**	**?**	**N/A**
	pMMB206	**M. Valvano**			
E. coli SM10lambda pir	**pUC18**	**M. Valvano**			
	pUC19	**M. Valvano**			
E. coli SY327	**pBR325**	**M. Valvano**			

	pTMod-RTp	**M. Valvano**			

** 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 ☒ NO

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

** Please attach a Material Safety Data Sheet or equivalent.*

4.4 Will genetic sequences from the following be involved?

- HIV ☐ NO ☐ YES, specify
- HTLV 1 or 2 or genes from any Level 1 or Level 2 pathogens ☐ NO ☐ YES, specify
- SV 40 Large T antigen ☐ NO ☐ YES
- E1A oncogene ☐ NO ☐ YES
- Known oncogenes ☐ NO ☐ YES, specify
- Other human or animal pathogen and or their toxins ☐ NO ☐ YES, specify

4.5 Will virus be replication defective? ☐ YES ☐ NO

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

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

5.0 Human Gene Therapy Trials

5.1 Will human clinical trials be conducted involving a biological agent? ☐ 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? ☐ YES ☐ 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? ☐ YES, number: ☐ NO ☐ PENDING

6.0 Animal Experiments

6.1 Will live animals be used? ☐ 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 Will any of the agents listed in section 4.0 be used in live animals
☐ NO ☐ YES, specify:

6.5 Will the agent(s) be shed by the animal:
☐ 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)? ☐ YES ☒ NO - If **NO**, please proceed to section 8.0

7.2 Will live animals be used? ☐ YES ☐ NO

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

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

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

8.0 Biological Toxins and Hormones

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

8.2 If YES, please name the toxin(s) or hormones(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 or hormone

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

8.5 How much of the toxin or hormone is stored*?

8.6 Will any biological toxins or hormones be used in live animals? ☐ YES ☐ NO
If **YES**, Please provide details:

*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? ☐ 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? ☐ Initiate and maintain colony, give location:
☐ "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? ☐ YES ☐ NO
If **YES**, Please attach the CFIA permit & describe any CFIA permit conditions:

10.0 Plants

10.1 Do you use plants? ☐ 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? ☐ Grow and maintain a crop ☐ "One-time" use

10.6 Do you do any modifications to the plant? ☐ YES ☐ 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? ☐ YES ☐ 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? ☐ YES, 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? ☐ YES ☐ NO

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

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

An X in the check box indicates you agree with the above statement... ☒
Enter Your Name Susan F. Koval ***Date:*** July 5, 2011

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. ☐ 1 ☒ 2 ☐ 2+ ☐ 3

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

☒ YES, date of most recent biosafety inspection: **April 8, 2010**
☐ NO, please certify
☐ NOT REQUIRED for Level 1 containment

13.3 Please indicate permit number (not applicable for first time applicants): **BIO_UWO-0211**

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.
N/A

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:
The contaminated area will be washed liberally with antibacterial liquid soap and water. In the case of a needlestick injury, an accident report form will be filled out.

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/

An X in the check box indicates you agree with the above statement... ☒
Enter Your Name **Susan F. Koval** *Date:* **July 5, 2011**

15.0 Approvals

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

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

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

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

Special Conditions of Approval:

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Bacteria

ATCC® Number: 43827™ Order this Item **Price:** $255.00

Organism:	*Escherichia coli* (Migula) Castellani and Chalmers
Designations:	ML35
Depositor:	SC Rittenberg
History:	ATCC <<--SC Rittenberg<<--M. Shilo <<--- A. Lwoff
Biosafety Level:	1
Shipped:	freeze-dried
Growth Conditions:	ATCC medium1604: Nutrient agar with 5 g/L of yeast extract **Temperature:** 37.0°C
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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Bacteria

ATCC® Number: 15252™ Order this Item **Price:** $255.00

Organism: *Caulobacter vibrioides* Henrici and Johnson deposited as *Caulobacter crescentus* Poindexter

Designations: CB 2

Isolation: tap water

Depositor: JL Stove

Biosafety Level: 1

Shipped: freeze-dried

Growth Conditions: ATCC medium36: Caulobacter medium
Temperature: 30.0°C

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.

Cross References: Nucleotide (GenBank) : AJ227756 Caulobacter crescentus DNA for 16S ribosomal RNA, strain CB2 (ATCC 15252T).

References:

9957: Poindexter JS. Biological properties and classification of the Caulobacter group. Bacteriol. Rev. 28: 231-295, 1964. PubMed: 14220656
36887: Skerman VB, et al. Approved lists of bacterial names. Int. J. Syst. Bacteriol. 30: 225-420, 1980.
44188: Abraham WR, et al. Phylogeny and polyphasic taxonomy of Caulobacter species. Proposal of Maricaulis gen. nov. with Maricaulis maris (Poindexter) comb. nov. as the type species, and emended description of the genera Brevundimonas and Caulobacter. Int. J. Syst. Bacteriol. 49: 1053-1073, 1999. PubMed: 10425763
70487: Moore RL, et al. Deoxyribonucleic acid homology among the caulobacters. Int. J. Syst. Bacteriol. 28: 349-353, 1978.

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Bacteria

ATCC® Number: 27050™ Order this Item **Price:** $255.00

Organism: *Aquaspirillum serpens* (Muller) Hylemon et al. emend. Boivin et al. deposited as *Spirillum serpens* (Muller) Winter

Designations: ICPB 3232 [VHL]

Depositor: MP Starr

Biosafety Level: 1

Shipped: freeze-dried

Growth Conditions: ATCC medium3: Nutrient agar or nutrient broth
Temperature: 26.0°C

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

Comments: host for Bdellovibrio sp.

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Bacteria

ATCC® Number: 15356™ Order this Item **Price:** $255.00

Organism:	*Bdellovibrio bacteriovorus* Stolp and Starr
Designations:	100 [NCIB 9529]
Isolation:	soil, California
Depositor:	H Stolp
Biosafety Level:	1
Shipped:	freeze-dried
Growth Conditions:	ATCC medium1603: DNB medium **Temperature:** 30.0°C
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.
Cross References:	Nucleotide (GenBank) : M61241 Bdellovibrio bacteriovorus 16S rRNA gene, partial cds. Nucleotide (GenBank) : BX842601Bdellovibrio bacteriovorus complete genome, strain HD100.
Type Strain:	yes(type strain)
Comments:	Distributed in the plant pathogen Erwinia amylovora ATCC 15357 Genome sequenced strain
References:	9664: Stolp HJ, Starr MP. Bdellovibrio bacteriovorus gen. et sp. n., a predatory, ectoparasitic and bacteriolytic microorganism. Antonie van Leeuwenhoek 29: 217-248, 1963. 36887: Skerman VB, et al. Approved lists of bacterial names. Int. J. Syst. Bacteriol. 30: 225-420, 1980.

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All prices are listed in U.S. dollars and are subject to change without notice. A discount off the current list price will be applied to most cultures for nonprofit institutions in the United States. Cultures that are ordered as test tubes or flasks will carry an additional laboratory fee. Fees for permits, shipping, and handling may apply.

Back to my Search

S.F. Koval: Bacterial cultures July 2011				
Bacterium	**Used Frequently**	**Human pathogen?**	**Animal pathogen?**	**BSL**
Acidovorax avenae				1
Acinetobacter johnsonii				2
Acinetobacter sp.				1
Aeromonas hydrophila		possible		2
Aeromonas salmonicida A449, A450			yes (fish)	1
Agrobacterium tumefaciens				1
Aquaspirillum serpens VHL, VHA, MW5	yes			1
Bacillus brevis 47				1
Bacillus megaterium				1
Bacteriovorax starrii A3.12	yes			1
Bacteriovorax stolpii UKi2	yes			1
Bdellovibrio bacteriovorus HD100, 109J. 6-5-S	yes			1
Burkholderia cenocepacia J2315, K56-2		yes		2
Burkholderia cepacia		yes		2
Burkholderia dolosa				
Burkholderia multivorans				2
Burkholderia stabilis				2
Burkholderia vietnamensis				
Caulobacter crescentus CB2A and other strains	yes			1
Chromobacterium violaceum		possible		2
Clavibacter michiganensis subsp. Michiganensis				
Deinococcus radiodurans Sark				1
Delftia acidovorans				1
Enterobacter aerogenes 62-1				1
Erwinia carotovora pv carotovora				1
Erwinia herbicola				1
Escherichia coli B, K12, AB264, RP437, K29, ML35	yes	not my strains		1
Lampropedia hyalina 884, 2283				1
Myxococcus xanthus DK1622				1
Photobacterium phosphoreum				1
Photorhabdus luminescens				1
Proteus mirabilis				2
Pseudomonas corrugata				1
Pseudomonas marginalis				1
Pseudomonas putida				1
Pseudomonas syringae pv glycinea				1
Pseudomonas syringae pv tomato				1
Rhizobium leguminosarum 3841, VF39SM				1
Salmonella typhimurium				2
Sinorhizobium meliloti 1021				1
Staphylococcus aureus Cowan, Oxford		possible		2
Synechococcus				1
Vibrio fisheri MJ1				1
Xanthomonas campestris pv tomato				
Xanthomonas vesicatoria				1

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,

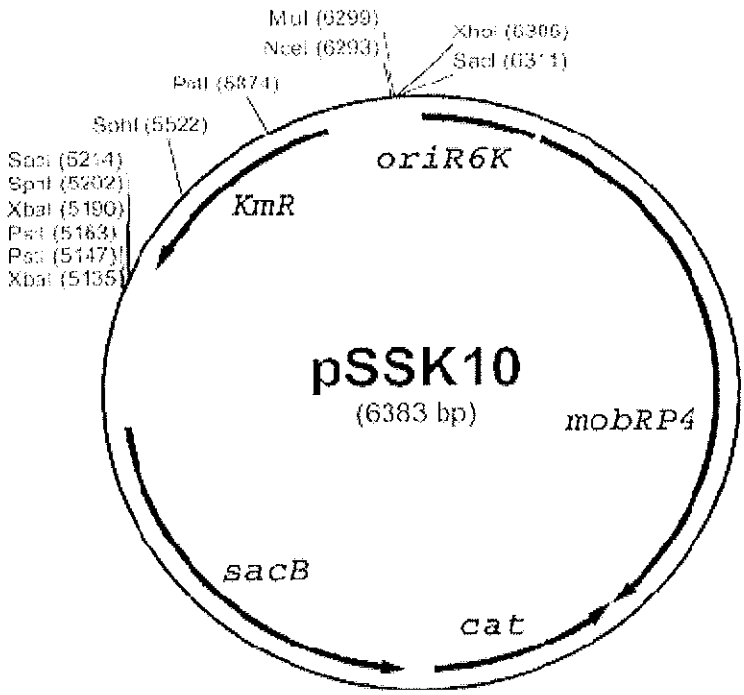
Cinthia Labrie
Head, Animal Pathogen Importation Program
Office of Biohazard Containment & Safety

Canada

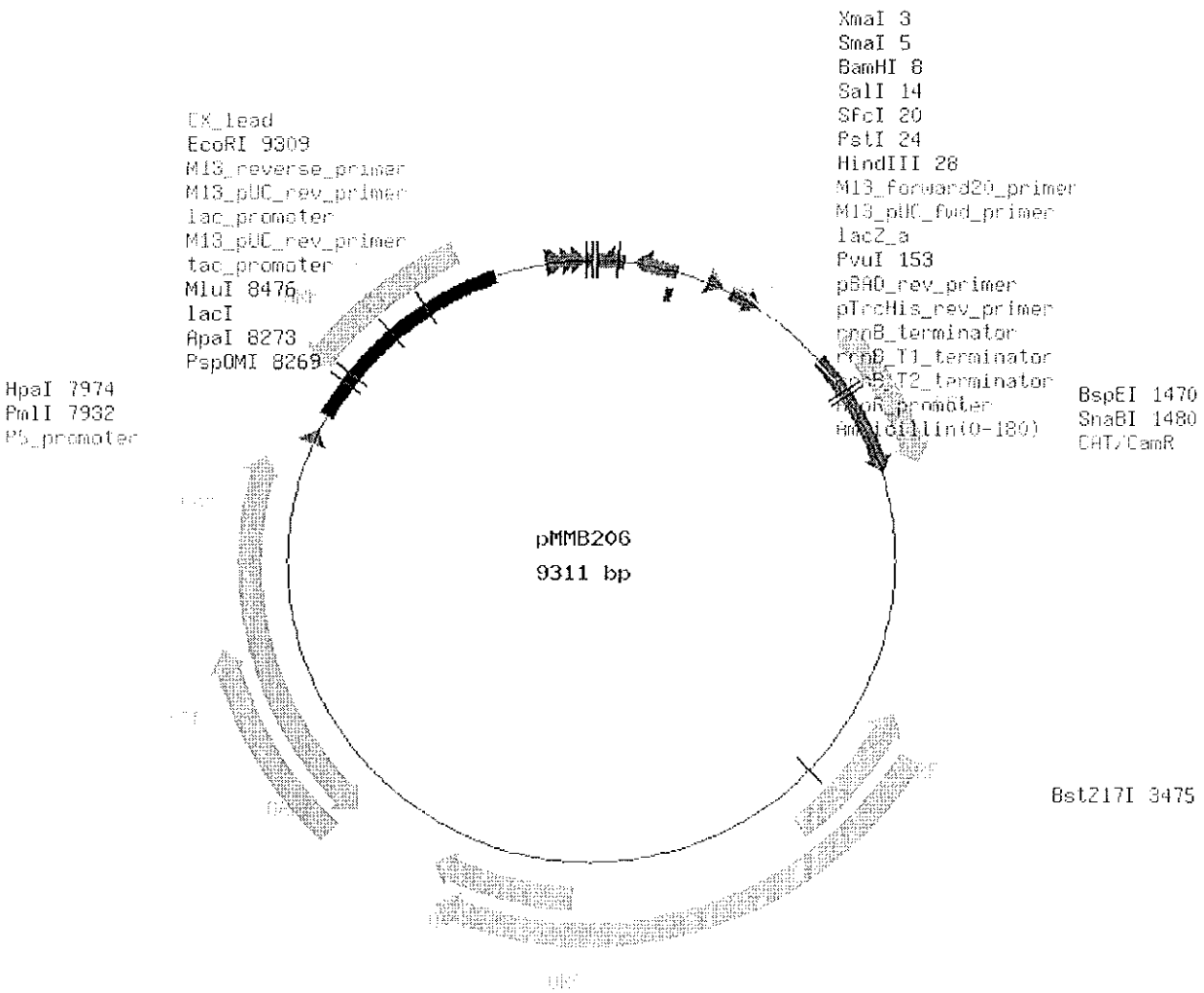
Plasmids in Use by Koval Lab

Plasmid	Length (bp)	Resistance Markers	Reference
pSSK10	6383	Cam^R, Kan^R	Steyert and Pineiro, 2007
pMMB206	9311	Cam^R, Amp^R	Morales, Backman and Bagdasarian, 1991
pUC18	2686	Amp^R	Vieira and Messing
pUC19	2686	Amp^R	Vieira and Messing
pBR325	5996	Amp^R, Cam^R, Tet^R	Bolivar F, Rodriguez RL, Greene PJ, Betlach MO, Heyneker HL, Boyer HW, Crosa I H, Falkow S, I 977
pTMod-RTp	4188	Tp^R	Dennis and Zylstra, 1998

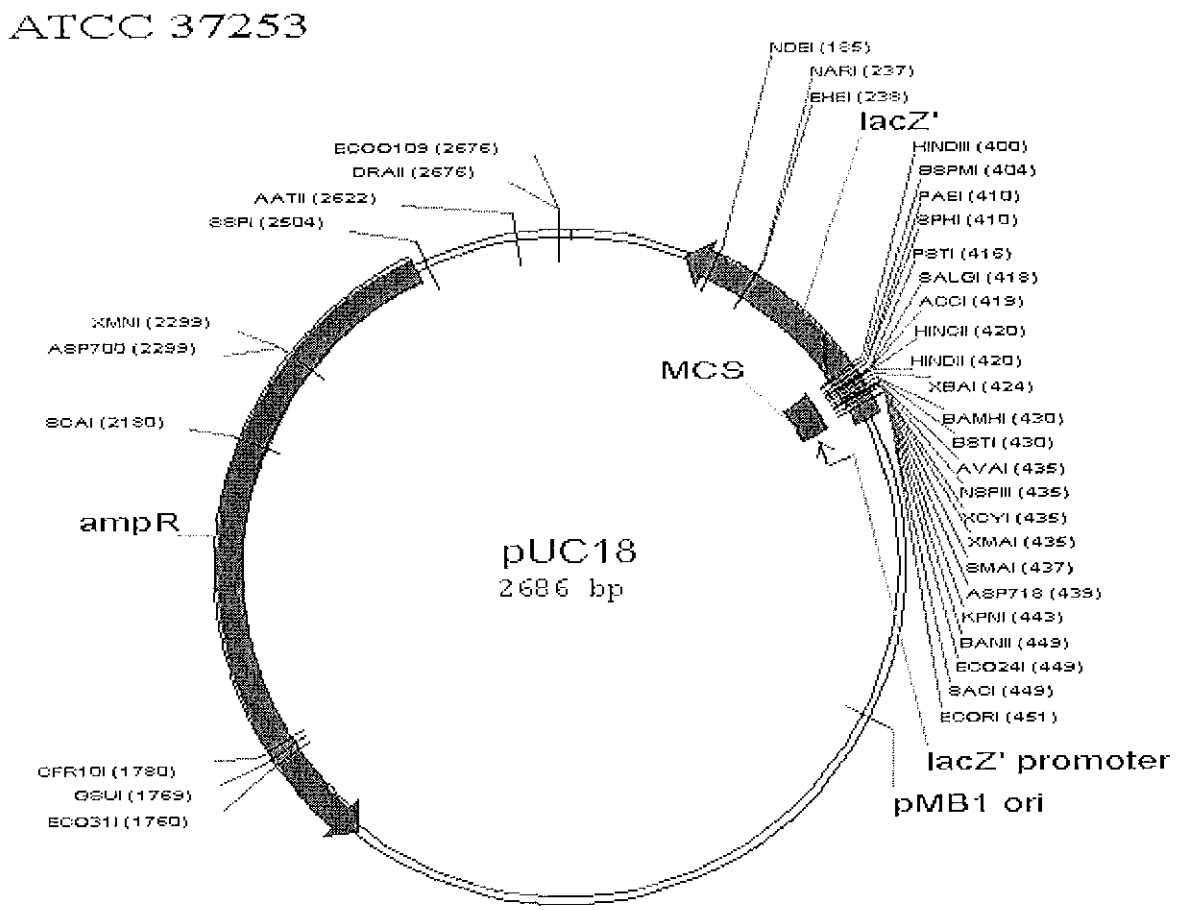
Plasmid: pSSK10



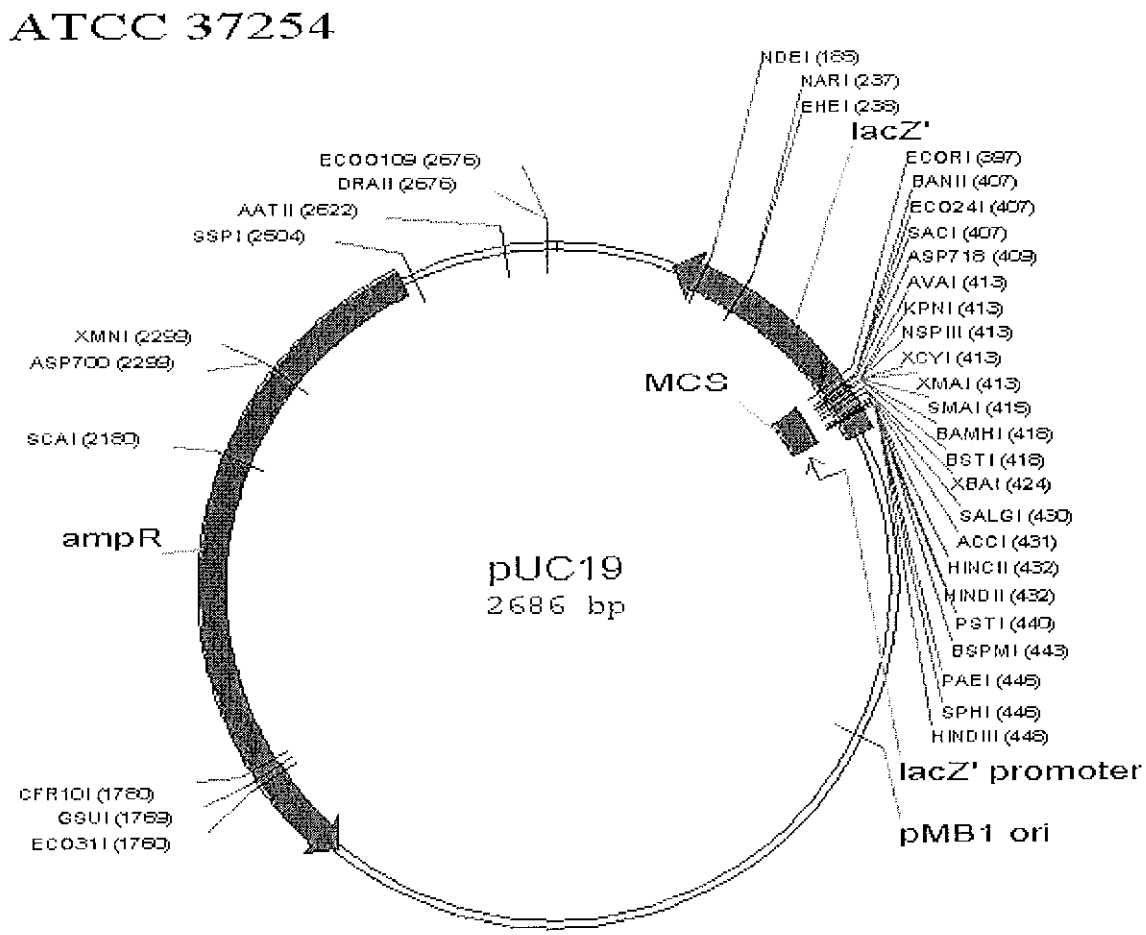
Plasmid: pMMB206



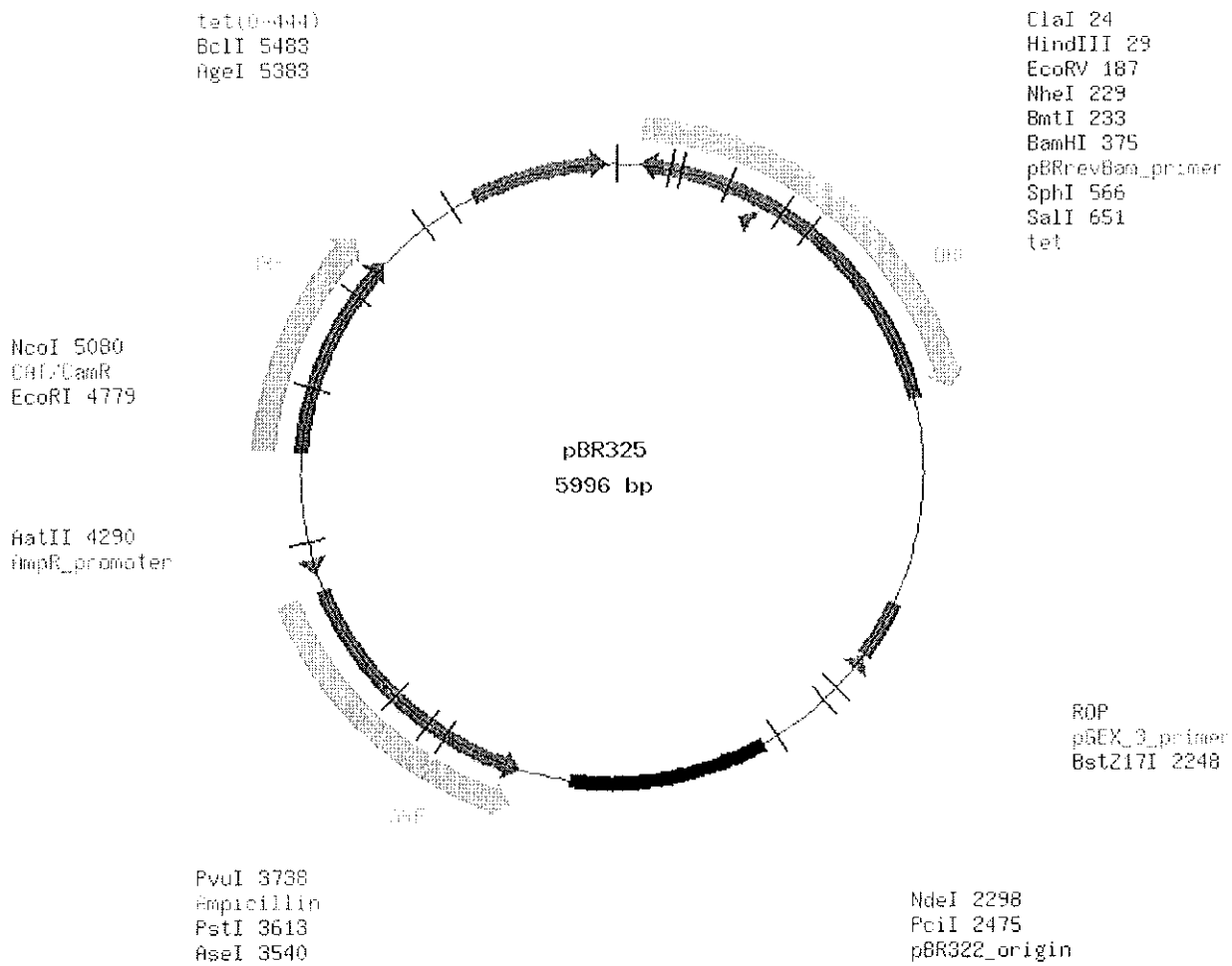
Plasmid: pUC18



Plasmid: pUC19



Plasmid: pBR325



Plasposon: pTnMod-RTp'