Modification Form for Permit BIO-UWO-0037

Permit Holder: David Haniford

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

Brian Munshaw

Crystal McLellan

Joe Ross

Additional Personnel
(Please list additional personnel here)

	Please stroke out any approved Biological Agent(s) to be removed	Write additional Biological Agent(s) for approval below. Give the full name
Approved Microorganisms	Salmonella typhimurium, Shigella flexneri 2a strain 2457T, haemophilus influenza RD KW20, E. coli DH5 alpha, E.coli K12	E.coli MG1655 (pHL814) E.coli MG1655 ΔhfqV (pHL991)
Approved Primary and Established Cells		
Approved Use of Human Source Material		
Approved Genetic Modifications (Plasmids/Vectors)		
Approved Use of Animals		
Approved Biological Toxin(s)		
Approved Gene Therapy		
Approved Plants and Insects		

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

As the Principal Investigator, I have ensured 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.shs.uwo.ca/workplace/newposition.htm

Signature of Permit Holder: _____

Current Classification: 1 **Containment Level for Added Biohazards:** 1

Date of Last Biohazardous Agents Registry Form: Mar 2, 2010

Date of Last Modification (if applicable): _____

BioSafety Officer(s): _____

Chair, Biohazards Subcommittee: _____ **Date:** _____

END USER STATEMENT:

HL 2308 (=HL 716 + pHL 814) , and HL 3904 (=HL 770 + pHL 991) are strains of *E.coli* MG1655 containing sRNA:GFP fusions. HL3904 contains a deletion of the *hfq* gene but otherwise is isogenic to HL2308. These organisms will be used to test transposition frequencies of IS10 and Tn10. Both of these organisms are level 1.

Product Information from Addgene: http://www.addgene.org/30022/

Plasmid 30022: HL 2308 (=HL 716 + pHL 814)

Gene/insert name:	pLtetO-1:MicC, pLtetO-1:OxyS, pLlacO-1:ompC::gfp
Insert size:	2100
Species:	E. coli
Fusion protein or tag:	GFP
Terminal:	C terminal on backbone
Vector backbone:	ColE (from pZ system) + AmpR (Search Vector Database)
Backbone manufacturer:	Lim Lab (modified from Rolf Lutz and Hermann Bujard, 1997)
Vector type:	Bacterial Expression
Backbone size w/o insert:	2000
Cloning site 5':	AatII
Site destroyed during cloning:	No
Cloning site 3':	ApaI
Site destroyed during cloning:	No
5' sequencing primer:	ctcatgagcggatacat atttgaa List of Sequencing Primers
3' sequencing primer:	agctgatacc gctcgccgca gccgaacg
Bacterial resistance:	Ampicillin
Growth strain:	DH5alpha
Growth temperature (℃):	37
High or low copy:	High Copy
Sequence:	View sequences (7)
Map:	View map
Principal Investigator:	Han Lim
Terms and Licenses:	MTA Tet Systems Limited Use Label License

Plasmid 30093: HL 3904 (=HL 770 + pHL 991)

Gene/insert name:	pLtetO-1:RhyB, pLlacO-1:hfq, pLtetO-1m9:sodB::gfp
Insert size:	2400
Species:	E. coli
Fusion protein or tag:	GFP
Terminal:	C terminal on backbone
Vector backbone:	ColE (from pZ system) + AmpR (Search Vector Database)
Backbone manufacturer:	Lim Lab (modified from Rolf Lutz and Hermann Bujard, 1997)
Vector type:	Bacterial Expression
Backbone size w/o insert:	2000
Cloning site 5':	AatII
Site destroyed during cloning:	No
Cloning site 3':	ApaI
Site destroyed during cloning:	No
5' sequencing primer:	ctcatgagcggatacat atttgaa List of Sequencing Primers
3' sequencing primer:	agctgatacc gctcgccgca gccgaacg
Bacterial resistance:	Ampicillin
Growth strain:	DH5alpha
Growth temperature (℃):	37
High or low copy:	High Copy
Sequence:	View sequences (7)
Map:	View map
Principal Investigator:	Han Lim
Terms and Licenses:	MTA Tet Systems Limited Use Label License

THE UNIVERSITY OF WESTERN ONTARIO
BIOHAZARDOUS AGENTS REGISTRY FORM
Approved Biohazards Subcommittee: September 25, 2009
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 or in charge of a laboratory/facility where the use of Level 1, 2 or 3 biohazardous 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 biohazards 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 Biohazard 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	Dr. David B. Hanford
SIGNATURE	
DEPARTMENT	Biochemistry
ADDRESS	Molecular Biology Labs, UWO
PHONE NUMBER	519 661-4013
EMERGENCY PHONE NUMBER(S)	519 641-8602
EMAIL	hanford@uwo.ca

Location of experimental work to be carried out: Building(s) MBL Room(s) C204/C103

*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 12.0, Approvals).

FUNDING AGENCY/AGENCIES: CIHR
GRANT TITLE(S): Regulation of Tn10 & Tn5 Transposition

PLEASE ATTACH A BRIEF DESCRIPTION OF YOUR WORK THAT EXPLAINS THE BIOHAZARDS USED AND HOW THEY WILL BE USED. PROJECTS SUBMITTED WITHOUT A SUMMARY WILL NOT BE REVIEWED. A GRANT SUMMARY PAGE MAYBE ADEQUATE IF IT PROVIDES SUFFICIENT DETAIL ABOUT EACH BIOHAZARD USED.

Names of all personnel working under Principal Investigators supervision in this location:

Joe Ross
Crystal McLellan
Brian Munchaw

*** 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 biological agents? ☑ YES O NO
(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)*	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
Salmonella enterica Typhimurium	☑ Yes O No	☑ Yes O No	☑ Yes O No	0.01	ATCC	O 1 ☑ 2 O 3
Shigella flexneri 2a strain 2457T	☑ Yes O No	☑ Yes O No	☑ Yes O No	0.01	ATCC	O 1 ☑ 2 O 3
Haemophilus influenzae Rd KW20	O Yes ☑ No	☑ Yes O No	☑ Yes O No	0.01	ATCC	O 1 ☑ 2 O 3
E.coli dH5 alpha E.coli K12	O Yes ☑ No	O Yes ☑ No	O Yes ☑ No			☑ 1 O 2 O 3

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

See email attached

2.0 Cell Culture

2.1 Does your work involve the use of cell cultures? O 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	O Yes O No		Not applicable
Rodent	O Yes O No		
Non-human primate	O Yes O No		
Other (specify)	O Yes O No		

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

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Supplier / Source
Human	O Yes O No		
Rodent	O Yes O No		
Non-human primate	O Yes O No		
Other (specify)	O Yes O 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 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/NO**	**Name of Infectious Agent (If applicable)**	**PHAC or CFIA Containment Level (Select one)**
Human Blood (whole) or other Body Fluid		O Yes O No O Unknown		O 1 O 2 O 3
Human Blood (fraction) or other Body Fluid		O Yes O No O Unknown		O 1 O 2 O 3
Human Organs or Tissues (unpreserved)		O Yes O No O Unknown		O 1 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
S. enterica	pSB-R27	present in strain	None	Deletion of 55K gene
S. flexneri	pSS-R27	" " ATCC	None	

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

4.3 Will genetic modification(s) 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
Bacteriophage HP1		ATCC	H-NS-like gene with disruption	use this transducing phage to make H-NS disruption in H. influenzae

* 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? O YES ☑ NO

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

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

5.0 Human Gene Therapy Trials

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

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

5.2 Will the biological agent be able to replicate in the host? O YES O NO

5.3 How will the biological agent be administered? _____

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

5.5 Has human ethics approval been obtained? O YES, number: _____ O NO O PENDING

6.0 Animal Experiments

6.1 Will live animals be used? O 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 O YES, specify: _____ O NO

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

_____

_____

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

7.0 Use of Animal species with Zoonotic Hazards

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

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

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 detais:_____ O NO

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

9.0 Insects Requiring CFIA Permits

9.1 Do you use insects that require a permit from the CFIA? 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 Please attach the CFIA permit.

9.8 Please describe any CFIA permit conditions:
_____
_____

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

10.0 Plants Requiring CFIA Permits

10.1 Do you use plants that require a permit from the CFIA? 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 NO, please forward the permit to he Biosafety Officer when available.

10.9 Please describe any CFIA permit conditions:
_____
_____
_____

11.0 Import Requirements

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

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

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

11.4 Has the import permit been sent to OHS? O 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 biohazardous agents in Sections 1.0 to 9.0 have been trained.

SIGNATURE _____

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

13.0 Containment Levels

11.1 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 3

13.2 Has the facility been certified by OHS for this level of containment?
O YES, permit # if on-campus_____
☑ NO, please certify
O NOT REQUIRED for Level 1 containment

Dr Edgell's lab is level 2

14.0 Procedures to be Followed

14.1 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 D.M. Edgell Date: Feb 9, 2010

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

_____

_____

_____

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

Immediate treatment with antiseptic soap

_____

15.0 Approvals

UWO Biohazard Subcommittee: SIGNATURE: G.M. Kidder
Date: 2 March 2010

Safety Officer for Institution where experiments will take place: SIGNATURE: J Stanley
Date: March 1, 2010

Safety Officer for University of Western Ontario (if different from above): SIGNATURE:_____
Date:_____

Approval Number: Bio-Uwo-0037 Expiry Date (3 years from Approval): March 1, 2013

Special Conditions of Approval:

- All work involving these biohazards must be done in Dr Edgell's laboratory (Level 2). JS
- Consult the bacteriologist, Dr. S. Koval (x 83439) on the Biohazards Subcommittee. JS

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

Project Description – PI Dr David B. Haniford

A portion of my CIHR proposal involves determining if disruption of hns-like genes in Salmonella enterica, Shigella flexneri and Haemophilus influenzae impacts on the transposition frequency of transposons Tn10 and Tn5. The aforementioned species are all gram-negative bacteria closely related to Escherichia coli. S. enterica and S. flexneri are human enteropathogens and the specific strains we will use, serovar Tymphimurium and 2a 2457T, respectively, are virulent strains. H. influenzae is a human respiratory pathogen and the strain we will use, Rd KW20, is avirulent. We will obtain strains of these bacteria from ATCC, perform the necessary genetic manipulations to disrupt the hns-like gene in each strain and then measure the transposition frequency of native Tn10 and Tn5 transposons. These experiments will involve small scale culturing of bacteria (5-10 ml per experiment) and plating the bacteria on standard agar-containing culture media. All centrifugation steps will be carried out with centrifuge tubes containing O-rings to ensure a tight seal. At the end of each experiment all bacterial cultures and plates containing bacteria will be autoclaved before disposal. All tips and disposable pipets used to handle the bacteria will also be autoclaved before disposal. Plating of bacteria will be performed in the laminar flow hood housed in Dr Edgell's lab one floor down from us in room C103 of the MBL.

-------- Original Message --------
Subject: Re: Use of E-coli?
Date: Wed, 03 Mar 2010 10:09:25 -0500
From: David Haniford <haniford@uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>

Yes, we do use E.coli (just the standard lab strains i.e. DH5a and other K12 derivatives) and no I don't have an ATCC # for HP1 bacteriophage.

Public Health Agency of Canada | Agence de la santé publique du Canada

Canada

Salmonella typhi - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: ***Salmonella typhi***

SYNONYM OR CROSS REFERENCE: Typhoid fever, Enteric fever, Typhus abdominalis, *Salmonella choleraesuis* serotype typhi, *Salmonella enterica* serotype typhi

CHARACTERISTICS: Family Enterobacteriaceae; Gram negative rod; motile, aerobic and facultatively anaerobic; serological identification of somatic, flagellar and Vi antigens

SECTION II - HEALTH HAZARD

PATHOGENICITY: Generalized systemic enteric fever, headache, malaise, anorexia, enlarged spleen, and constipation followed by more severe abdominal symptoms; rose spots on trunk in 25% of Caucasian patients; complications include ulceration of Peyer's patches in ileum, can produce hemorrhage or perforation; Common enterocolitis may result without enteric fever; characterized by headache, abdominal pain, nausea, vomiting, diarrhea, dehydration may result; case fatality of 16% reduced to 1% with antibiotic therapy; mild and atypical infections occur

EPIDEMIOLOGY: Worldwide; sporadic cases in North America; most cases represent importation from endemic areas; multi-drug resistant strains have appeared in several areas of world

HOST RANGE: Humans

INFECTIOUS DOSE: 100,000 organisms - ingestion; variable with gastric acidity and size of inoculum

MODE OF TRANSMISSION: Person-to-person; by contaminated food or water; by food contaminated by hands of carriers; flies can infect foods in which the organisms may multiply to achieve an infective dose

INCUBATION PERIOD: Depends on size of infecting dose; usually 1-3 weeks

COMMUNICABILITY: Communicable as long as typhoid bacilli appear in excreta; usually 1st week throughout convalescence; 10% of patients discharge bacilli for 3 months after onset; 2-5% become chronic carriers, may shed bacteria for years

SECTION III - DISSEMINATION

RESERVOIR: Humans - patients with acute illness and chronic carriers

ZOONOSIS: None

VECTORS: Possibly flies (mechanical only)

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Susceptible to chloramphenicol, ampicillin, amoxicillin, TMP-SMX, fluoroquinolones; Multi-drug resistant (MDR) strains are on the rise; drug susceptibility testing is required

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, 2% glutaraldehyde, iodines, phenolics, formaldehyde

PHYSICAL INACTIVATION: Sensitive to moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour)

SURVIVAL OUTSIDE HOST: Ashes - 130 days; rabbit carcass - 17 days; dust - up to 30 days; feces - up to 62 days; linoleum floor - 10 hours; ice - 240 days; skin - 10-20 min

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; bacteriological examination of blood, excreta; serology not effective

FIRST AID/TREATMENT: Antibiotic therapy for enteric fever; determine appropriate antibiotic with drug susceptibility testing

IMMUNIZATION: Two typhoid vaccines licensed in Canada, one injectable one oral; vaccine administered for occupational exposure or travel to endemic areas for greater than 4 weeks; does not offer complete protection, immunity may be overwhelmed by large inoculum; oral vaccine is contraindicated in immunocompromised and pregnant individuals

PROPHYLAXIS: Antibiotic prophylaxis

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: Typhoid is the second most commonly reported laboratory infection; at least 256 reported cases with 20 deaths

SOURCES/SPECIMENS: Feces, urine, bile, blood

PRIMARY HAZARDS: Ingestion, parenteral inoculation; importance of aerosol exposure not known

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment, and facilities for all activities utilizing known or potentially infectious clinical materials and cultures

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

OTHER PRECAUTIONS: Good personal hygiene and frequent hand washing; vaccination for those regularly working with *S. typhi* cultures or clinical materials

SECTION VIII - HANDLING INFORMATION

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

DISPOSAL: Decontaminate before disposal; steam sterilization, chemical disinfection

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: March, 2001

Prepared by: Office of Laboratory Security, PHAC

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

Public Health Agency of Canada | Agence de la santé publique du Canada

Canada

Shigella spp. - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Shigella* spp.

SYNONYM OR CROSS REFERENCE: Group A - *S. dysenteriae*, Group B - *S. flexneri,* Group C - *S. boydii,* Group D - *S. sonnei*; Shigellosis, Bacillary dysentery

CHARACTERISTIC: Family Enterobacteriaceae; Gram negative rod, non-encapsulated, non-sporogenous, non-motile; serological identification of somatic antigens; four serogroups historically treated as species; *S. disenteriae* may produce enterotoxin (Shiga toxin)

SECTION II - HEALTH HAZARD

PATHOGENICITY: Acute disease of large and small intestine; diarrhea, fever, nausea, and sometimes toxemia, vomiting, cramps and tenesmus; stools contain blood, mucus and pus; alterations in consciousness may occur; mild and asymptomatic infections occur; severity of illness depends on host, dose and serotype - *S. dysenteriae* infections have up to 20% case fatality rate in hospitalized patients, while *S. sonnei* infections have negligible fatality rate; *S.flexneri* precipitate reactive arthritis (Reiter's syndrome) in some patients

EPIDEMIOLOGY: Worldwide; 2/3 of cases and most deaths are children under 10 years; common during weaning period; 10-40% secondary attack rates in households; outbreaks under conditions of crowding and poor sanitation; endemic in tropical and temperate climates

HOST RANGE: Humans, primates (outbreaks have occurred in colonies)

INFECTIOUS DOSE: 10-200 organisms by ingestion

MODE OF TRANSMISSION: By direct or indirect fecal-oral transmission from a patient or carrier; poor hygiene practices spread infection to others by direct physical contact or indirectly by contaminating food; water, milk, cockroach, and fly-borne transmission may occur as the result of direct fecal contamination; sexual transmission in homosexual men

INCUBATION PERIOD: One to 7 days, usually 1-3 days

COMMUNICABILITY: Communicable during acute infection and until agent is no longer present in feces, usually within 4 weeks after illness; asymptomatic carriers may transmit infection; the carrier state may persist for months or longer (although rarely)

SECTION III - DISSEMINATION

RESERVOIR: Humans are the only significant reservoir; outbreaks have occurred in primate colonies

ZOONOSIS: None

VECTORS: Flies (mechanical only)

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to one or more of TMP-SMX, ampicillin, chloramphenicol,

ciprofloxacin, ofloxacin; multidrug resistant (MDR) strains are common

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, 2% glutaraldehyde, iodines, phenolics, formaldehyde

PHYSICAL INACTIVATION: Sensitive to moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour)

SURVIVAL OUTSIDE HOST: Feces up to 11 days; flies - up to 12 days; water - 2 to 3 days; shirts of patients - 8 days

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm by stool culture

FIRST AID/TREATMENT: Fluid and electrolyte replacement; conduct antibiotic susceptibility tests and administer antibiotic therapy if illness is severe (avoid drugs which slow intestinal motility)

IMMUNIZATION: None

PROPHYLAXIS: Administration of antibiotics for prophylaxis generally not recommended

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: at least 81 reported cases of shigellosis acquired from a laboratory before 1991

SOURCES/SPECIMENS: Feces; rarely, blood of infected humans and animals

PRIMARY HAZARDS: Ingestion or parenteral inoculation; importance of aerosols exposure not known

SPECIAL HAZARDS: Experimentally infected guinea pigs, other rodents and non-human primates are a proven source of infection

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment, and facilities for all activities utilizing known or potentially infectious clinical materials or cultures; animal biosafety level 2 facilities and practices for activities with experimentally or naturally infected animals

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

OTHER PRECAUTIONS: Good personal hygiene and frequent handwashing

SECTION VIII - HANDLING INFORMATION

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

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

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: March, 2001

Prepared by: Office of Laboratory Security, PHAC

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Haemophilus influenzae (group b) - Material Safety Data Sheets (MSDS)

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MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Haemophilus influenzae* (group b)

SYNONYM OR CROSS REFERENCE: *Haemophilus meningitis*, bacterial meningitis, Pfeiffer's bacillus, Hib

CHARACTERISTICS: Gram-negative, coccobacillus, aerobic, non-motile, polysaccharide capsulated biotype I (pathogenic for children) and non-capsulated biotypes II and III (normal inhabitants)

SECTION II - HEALTH HAZARD

PATHOGENICITY: Most common bacterial meningitis in children, neurologic sequelae occurs in 15-30%; otitis media or sinusitis may be a precursor; associated with bacteremia; sudden onset, fever, vomiting, lethargy, meningeal irritation of bulging fontanelle in infants or stiff neck in older children; progressive stupor or coma; acute epiglottitis (obstructive laryngitis); arthritis; cellulitis; osteomyelitis; pericarditis; case fatality rate is 2-5%

EPIDEMIOLOGY: Worldwide; most prevalent in the 2-month to 3-year age group, unusual over 5 years; secondary cases may occur in families and day-care centres; bimodal seasonal pattern of infection peaking in September/December and March/May; individuals with chronic diseases (e.g. sickle cell anaemia) are particularly susceptible

HOST RANGE: Humans

INFECTIOUS DOSE: Not known

MODE OF TRANSMISSION: By droplet infection and discharges from nose and throat during the infectious period; portal of entry is most commonly nasopharyngeal

INCUBATION PERIOD: Short, 2-4 days

COMMUNICABILITY: Communicable as long as organisms are present; may be for a prolonged period even without nasal discharge; noncommunicable within 24-48 hours after starting effective antibiotic therapy

SECTION III - DISSEMINATION

RESERVOIR: Humans

ZOONOSIS: None

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Chloramphenicol or an effective third generation cephalosporin (cefotaxime or ceftriaxone)

DRUG RESISTANCE: Ampicillin (24%), trimethoprim/sulphamethoxazole (13.7%), loracarbef

(6.1%), cefaclor (4.2%)

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, 70% ethanol, iodines, glutaraldehyde, formaldehyde

PHYSICAL INACTIVATION: Sensitive to moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour)

SURVIVAL OUTSIDE HOST: Sputum - 12 days; wooden spatula - 2-7 days; plastic - 7-16 days

SECTION V - MEDICAL

SURVEILLANCE: Monitor for clinical signs; smears and bacteriological studies

FIRST AID/TREATMENT: Antibiotic therapy for 10-14 days

IMMUNIZATION: Conjugate haemophilus vaccine recommended for children> 18 months of age and other high risk groups

PROPHYLAXIS: Rifampin prophylaxis for close contacts

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 4 reported cases up to 1976 by Pike; 1 eye infection reported by Jacobson et al. (1985)

SOURCES/SPECIMENS: Blood, cerebrospinal fluid, pharyngeal exudates, pleural fluid, joint fluid, middle-ear aspirates

PRIMARY HAZARDS: Droplet exposure of mucous membranes; infectious aerosols; parenteral inoculation; ingestion

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 containment and practices for all activities involving clinical materials or cultures; additional personnel precautions and containment equipment as described for Biosafety level 3 for activities with high potential for aerosol production

PROTECTIVE CLOTHING: Laboratory coat; gloves when direct contact with infectious materials is unavoidable; gloves and gown (ties in back with tight wrists) when working in biosafety cabinet

OTHER PRECAUTIONS: None

SECTION VIII - HANDLING INFORMATION

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

DISPOSAL: Decontaminate before disposal - steam sterilization, chemical disinfection, incineration

STORAGE: In sealed containers that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: April, 2001

Prepared by: Office of Laboratory Security, PHAC

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