Modification Form for Permit BIO-UWO-0155

Permit Holder: John McCormick

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

~~Peter Bastedo~~

Katherine Kasper

Nur Rahman

Christine Herfst

Delfina Mazzuca Siroen

~~Mohammad Hussain~~

~~Lindsay Bowman~~

~~Shipa Gupta~~

Stacey Xu

Brent Armstrong

Kelcey Patterson

~~Jingru Li~~

Fraser Pollard

Additional Personnel
(Please list additional personnel here)

Lorea Baroja
Joseph Zeppa

Spelling error(s) / Typo(s)

	Please stroke out any approved Biological Agent(s) to be removed	
Approved Microorganisms	E. coli, Streptococcus pyogenes, Staphylococcus aureus, Lactobacillus reuteri, Steptococcus gordonii	Listeria monocytogeries (see mod appendix 1) Streptococcus agalactiae (see mod appendix 2
Approved Primary and Established Cells	Human (primary) peripheral blood mononuclear cells. Rodent (primary) splenocytes, hepatocytes, Lymph Nodes, Thymocytes, Bone marrow derived dendritic cells, Nasal associated lymph node tissues.	
Approved Use of Human Source Material	Human blood (whole) or other body fluid, Human blood (fraction) or other body fluid: Healthy volunteers.	
Approved Genetic Modifications (Plasmids/Vectors)	E.coli [plasmids]: pET28a, pBluescrip, pGhost, pMAD, pAmilux. S. pyogenes [plasmid]: pGhost. S. aueus [plasmid]: pMAD, pAmilux. Phage 80alpha [vectors]: pMAD, pAmilux.	
Approved Use of Animals	Mouse	

Approved Biological Toxin(s)	Superantigens	

* *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..* see attached description 1 (Modification 1) September 7, 2011

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: John Mulvey 7 Sept 2011

Current Classification: 2 **Containment Level for Added Biohazards:** 2

Date of Last Biohazardous Agents Registry Form: Jun 21, 2010

Date of Last Modification (if applicable): _____

BioSafety Officer(s): _____

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

MODIFICATION 1 (September 7th, 2011) McCormick

Listeria monocytogenes will be used to test a new ELISA protocol for detection of this species by Dr. Michael Reider's group. L. monocytogenes will be manipulated and grown under Level II conditions, and stored frozen at -80°C. Disposal will be done by standard UWO procedures for autoclaving.

Streptococcus agalactiae will be used to test for secretion of a signaling compound to up-regulate gene expression in Staphylococcus aureus. S. agalactiae will be manipulated and grown under Level II conditions, and stored frozen at -80°C. Disposal will be done by standard UWO procedures for autoclaving.

mod appendix 1

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

Canada

Listeria monocytogenes - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: ***Listeria monocytogenes***

SYNONYM OR CROSS REFERENCE: Listeriosis, Listerella

CHARACTERISTICS: Gram-positive, non-spore forming, aerobic bacilli; hemolytic and catalase positive; tendency to form chains and palisades, growth at 4° C, intracellular; food-borne human pathogen usually caused by serovars 1/2a, 1/2b and 4b

SECTION II - HEALTH HAZARD

PATHOGENICITY: Opportunistic pathogen manifested in the elderly, in neonates and or among immunocompromised individuals as meningoencephalitis and/or septicemia; inapparent infection at all ages with consequence only during pregnancy; perinatal infections occur transplacentally and can result in abortion, stillbirth; meningitis, endocarditis, septicemia, and disseminated granulomatous lesions in adults

EPIDEMIOLOGY: Uncommonly diagnosed infection; typically sporadic; few recent outbreaks associated with food; nosocomial acquisition; 40% of clinical cases occur in infants; in adults infection occurs mainly after age 40; European studies have disclosed large numbers of human carriers; case fatality rate in newborns is 50%

HOST RANGE: Mammals, birds, fish, crustaceans and insects

INFECTIOUS DOSE: Not known

MODE OF TRANSMISSION: In neonates, transmission from mother to fetus *in utero* or during passage through infected birth canal; direct contact with infectious material or soil contaminated with infected animal feces can result in papular lesions on hands and arms; ingestion of contaminated food (vegetables and dairy products have been reported); venereal contact and inhalation of the organism is possible; nursery outbreaks via hands of medical staff

INCUBATION PERIOD: Variable, outbreak cases have occured 3-70 days following a single exposure to an implicated product, median incubation is estimated at 3 weeks

COMMUNICABILITY: Mothers of infected newborn infants may shed the agent for 7-10 days after delivery; infected individuals can shed organism in the stool for several months

SECTION III - DISSEMINATION

RESERVOIR: Infected domestic and wild mammals, fowl and humans; infection of foxes produces

an encephalitis simulating rabies; asymptomatic fecal carriage in man (5%) and animals; frequently found in free-living water and mud; seasonal use of silage as fodder is frequently followed by an increased incidence of listeriosis in animals

ZOONOSIS: Yes, all domestic and wild animals are susceptible; proper precautions by farmers and veterinarians in handling aborted fetuses are recommended

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to penicillin, ampicillin, aminoglycosides, tetracyclines (resistance has been observed), chloramphenicol

SUSCEPTIBILITY TO DISINFECTANTS: Moderately susceptible to disinfectants - 1% sodium hypochlorite, 70% ethanol, glutaraldehyde

PHYSICAL INACTIVATION: Sensitive to moist heat (121° C for at least 15 min) and dry heat (160-170° C for at least 1 hour); able to grow at low temperatures (-0.4 to -0.1° C); sensitive to short wave UV and gamma irradiation

SURVIVAL OUTSIDE HOST: Survives well in soil, water, food, feces

SECTION V - MEDICAL

SURVEILLANCE: Found in feces, CSF, blood; routine smear from all newborn infants examined for *L. monocytogenes*

FIRST AID/TREATMENT: Antibiotic therapy, penicillin or ampicillin alone or together with aminoglycosides; resistant to cephalosporins including third generation cephalosporins

IMMUNIZATION: None

PROPHYLAXIS: None

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: Not a common laboratory-associated infection; 2 reported infections

SOURCES/SPECIMENS: Cerebrospinal fluid, blood, placental or fetal tissue, genital tract secretions, amniotic fluid

PRIMARY HAZARDS: Experimentally infected animals are a risk factor to laboratory workers; ingestion is the common mode of exposure, however may cause eye and skin infection following direct exposure; parenteral inoculation, ingestion, exposure to highly concentrated aerosols

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for all activities involving clinical materials or cultures; biosafety cabinets should be used for activities likely to generate aerosols

PROTECTIVE CLOTHING: Laboratory coat; gloves and eye protection when direct contact with infectious materials is unavoidable

OTHER PRECAUTIONS: Pregnant women should avoid contact with infected materials

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: 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.

Date Modified: 2011-02-18

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Canada

Streptococcus agalactiae - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: ***Streptococcus agalactiae***

SYNONYM OR CROSS REFERENCE: Group B streptococci

CHARACTERISTICS: Gram-positive cocci, ~2.0 µm occurring in pairs and short chains, facultatively anaerobic, beta hemolysis on blood agar

SECTION II - HEALTH HAZARD

PATHOGENICITY: Associated with diseases of the newborn; 90% of cases have septicemia, 40% have pulmonary involvement, and 30% have meningeal involvement; early onset disease acquired in utero or during passage through the birth canal and can have a case fatality rate of 50%; late onset disease with onset from 1 week to 3 months after birth have a case fatality rate of 20% and are probably acquired from the environment: survivors of meningitis cases can be left with hearing loss, blindness, cerebral palsy, mental retardation and/or epilepsy; adult infections include pneumonia, urinary tract infection, peritonitis, meningitis, endocarditis, osteomyelitis and rarely pharyngitis

EPIDEMIOLOGY: Worldwide; mainly causes diseases in infants <3 months of age with low birth weight and in the elderly; predispositions include diabetes mellitus, cancer, HIV

HOST RANGE: Humans, cattle (mastitis), other animals

INFECTIOUS DOSE: Not known

MODE OF TRANSMISSION: The manner of acquisition varies by age; 10-30% of pregnant women harbor Group B streptococci in the genital tract; approximately 1% of their offspring develop symptomatic infection within 6 days of birth; source of infection in older infants, children and adults are not well established

INCUBATION PERIOD: One to seven days for early onset disease, seven days to months for late onset disease

COMMUNICABILITY: Humans carry organisms in throat and vagina; attempts to eradicate genital tract group B streptococci in women during pregnancy with oral antibiotics only partially successful due to reinfection from rectal carriage of the organism or by reacquisition from culture-positive sexual partners

SECTION III - DISSEMINATION

RESERVOIR: Humans, cattle, horses, dogs, rabbits, guinea pigs, mice

ZOONOSIS: Possibly through direct or indirect contact with infected animals (mostly livestock

workers); strains causing disease in humans are usually biochemically, metabolically or serologically different than those causing disease in animals; if animal transmission to humans does occur it is rare and of little significance

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to penicillin or ampicillin; some strains penicillin tolerant and require treatment with an aminoglycoside as well

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

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: Dust - 20 to 30 days; contaminated cows feces - 21-63 days; litter - 20-30 days; paper contaminated with infected milk 4 days; urine 2-6 days; wood - 11 days

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm bacteriologically

FIRST AID/TREATMENT: Antibiotic therapy

IMMUNIZATION: None available

PROPHYLAXIS: Administration of penicillin or ampicillin at the onset and throughout labor to women who are colonized with group B and who are at high risk of delivering an infected infant (premature)

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 78 recorded cases of *Streptococcus* spp. up to 1976

SOURCES/SPECIMENS: Blood, genital specimens, feces, urine, throat swabs and respiratory specimens

PRIMARY HAZARDS: Accidental parenteral inoculation; ingestion: inhalation of infectious aerosols, direct contact

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for all activities involving known or potentially infected clinical materials or culture; animal biosafety level 2 facilities for studies utilizing infected animals

PROTECTIVE CLOTHING: Laboratory coat; gloves when contact with infectious materials in unavoidable

OTHER PRECAUTIONS: None

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel 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

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.

Date Modified: 2011-02-18

Subject: Re: Modification Form: McCormick
From: Jennifer Stanley <jstanle2@uwo.ca>
Date: Thu, 08 Sep 2011 11:26:59 -0400
To: John McCormick <john.mccormick@schulich.uwo.ca>
CC: Delfina Mazzuca Siroen <dmazzuca@uwo.ca>

HI there

Also, how do you verify the the *Listeria* is killed?

Regards
Jennifer

On 9/8/2011 9:20 AM, Jennifer Stanley wrote:

> Hi Dr. McCormick
>
> I got your modification this morning - thanks for doing that!
>
> My understanding is that the *Listeria monocytogenes* is killed and then given to the Reider group for ELISA. Can you tell me how the samples are treated/killed?
>
> Regards,
> Jennifer

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. John McCormick
SIGNATURE	John McCormick
DEPARTMENT	Microbiology and Immunology
ADDRESS	133 SDRI
PHONE NUMBER	83309 office, 80951 lab
EMERGENCY PHONE NUMBER(S)	519 200 8364
EMAIL	john.mccormick@schulich.uwo.ca

Location of experimental work to be carried out: Building(s) ____SDRI_____ Room(s)___131,133___

*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 and NSERC_____

GRANT TITLE(S): Molecular characterization of bacterial superantigens and their host receptors-CIHR: Functional characterization of collagen binding proteins from lactobacillus fermentum NSERC

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. See Attachment 1 and Attachment 2

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

Christine Herfst, Jingru Li, Katherine Kasper, Delfina Mazzuca Siroen, Brent Armstrong, Kelcey Patterson, Stacey Xu, Shipa Gupta, Jacqui Hayworth

*** 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? X 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? X YESO NO
If YES, please give the name of the species. ___
_____Streptococcus pyogenes –Strain ATCC-# BAA-595 (MGAS-315), ATCC# BAA-947 (MGAS-947), ATCC# BAA-572 (MGAS-572)_PHA-13809 __and Group G Streptococcus (human clinical isolate) PHA-13809_____

What is the origin of the microorganism(s)? _____ATCC_____

Please describe the risk (if any) of escape and how this will be mitigated: ___Organisms are susceptible to many disinfectants-1% sodium hyochlorite, 70% ethanol, glutaraldehyde, formaldehyde, iodines. Also, organisms are sensitive to moist heat (121oC for at least 15 mins) and dry heat (160-170 oC for at least 1 hour). If not handled under proper aseptic techniques (use of PPE) could result in symptoms; Monitor for symptoms, confirm by bacteriological and serological testing. Antibiotic therapy with Penicillin (erythromycin for penicillin-sensitive patients).

Please attach the CFIA permit. See Attachment 3 (PHA P-13809 and P-13810)
Please describe any CFIA permit conditions: See Attachment 3 (PHA P-13809 and P-13810)

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
E coli (Cloning Strains)	O Yes X No	O Yes X No	O Yes X No	4 Litres	Laboratory stocks	X 1 O 2 O 3
Streptococcus pyogenes	X Yes O No	O Yes X No	O Yes X No	100mLs	Laboratory stocks	O 1 X 2 O 3
Staphylococcus aureus	X Yes O No	X Yes O No	X Yes O No	100mLs	Laboratory stocks	O 1 X 2 O 3
Lactobacillus reuteri	O Yes X No	O Yes X No	O Yes X No	1 Litre	Laboratory stocks	O 1 X 2 O 3
Streptococcus gordonii	X Yes O No	O Yes X No	O Yes X No	100mLs	Laboratory stocks	O 1 X 2 O 3

*Please attach a Material Safety Data Sheet or equivalent from the supplier.
See Attachment 4

2.0 Cell Culture

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

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

Cell Type	Is this cell type used in your work?	Source of Primary Cell Culture Tissue	AUS Protocol Number

Human	X Yes O No	Peripheral Blood Mononuclear Cells (PBMCs), (Human Ethics Protocol 09911E, 12211E)	Not applicable
Rodent	X Yes O No	Splenocytes, Hepatocytes, Lymph Nodes, Thymocytes, Bone Marrow Derived Dendritic Cells, Nasal Associated Lymph node Tissues (NALT)	
Non-human primate	O Yes X No		
Other (specify)	O Yes X No		

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Supplier / Source
Human	X Yes O No	Jurkat T cell, Bare lymphocyte syndrome (BLS), B cell live, Please See Attachment 5a	ATCC, Madrenas lab UWO/Robarts, Kotb Lab U. Tennessee
Rodent	O Yes X No		
Non-human primate	O Yes X 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) Please See Attachment 5b

2.4 For above named cell types(s) indicate PHAC or CFIA containment level required X 1 O 2 O 3

3.0 Use of Human Source Materials

3.1 Does your work involve the use of human source materials? X YES O 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	Healthy Volunteers	O Yes O No X Unknown		O 1 X 2 O 3
Human Blood (fraction) or other Body Fluid	Healthy Volunteers	O Yes O No X Unknown		O 1 X 2 O 3
Human Organs or Tissues (unpreserved)	N/A	O Yes O No O Unknown		O 1 O 2 O 3
Human Organs or Tissues (preserved)	N/A	Not Applicable		Not Applicable

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

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? X YES O NO If no, please proceed to Section 5.0

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

Bacteria Used for Cloning *	Plasmid(s) *	Source of Plasmid	Gene Transfected	Describe the change that results
E. coli	pET28a, pBluescript pGhost pMAD pAmilux	Novagen Strategene P. Cleary (U. Minnesota) D. Heinrichs (UWO) J. Davies (UBC)	various various S. aureus promoters	E. coli is used as either a cloning host or for protein expression. These strains are a virulent
S. pyogenes	pGhost	see above	various	we generally make knockout mutants in S. pyogenes - the only expected changes, if any, would be reduction in virulence
S. aureus	pMAD pAmilux	see above	various promoters	we generally make knockout mutants or promoter reporters based on luciferase in S. pyogenes - the only expected changes, if any, would be reduction in virulence

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

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

Virus Used for Vector Construction	Vector(s) *	Source of Vector	Gene(s) Transduced	Describe the change that results
Phage 80alpha (S. aureus specific)	as above for S. aureus	ATCC	various	mostly for measuring gene transcription - no expected phenotypic change to S. aureus

* Please attach a Material Safety Data Sheet or equivalent.

4.4 Will genetic sequences from the following be involved?

- HIV O YES, please specify _____ X NO
- HTLV 1 or 2 or genes from any Level 1 or Level 2 pathogens O YES, specify _____ X NO
- SV 40 Large T antigen O YES X NO

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

- E1A oncogene O YES X NO
- Known oncogenes O YES, please specify _____ X NO
- Other human or animal pathogen and or their toxins X YES, please specify: bacterial superantigens O NO

4.5 Will virus be replication defective? O YES O NO **N/A**

4.6 Will virus be infectious to humans or animals? O YES O NO **N/A**

4.7 Will this be expected to increase the containment level required? O YES O NO **N/A**

5.0 Human Gene Therapy Trials

5.1 Will human clinical trials be conducted involving a biological agent? O YES X 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 **N/A**

5.3 How will the biological agent be administered? _____ **N/A**

5.4 Please give the Health Care Facility where the clinical trial will be conducted:_____ **N/A**

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

6.0 Animal Experiments

6.1 Will live animals be used? X YES O NO If no, please proceed to section 7.0

6.2 Name of animal species to be used_____mouse_____

6.3 AUS protocol # _____2009-038 and 2009-089_____

6.4 Will any of the agents listed in section 4.0 be used in live animals X YES, specify: __*Streptococcus pyogenes* and *Staphylococcus aureus*, O NO

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

The infections are not intestinal, nor are the bacteria intestinal pathogens and are not expected to be shed.

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

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

8.0 Biological Toxins

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

8.2 If YES, please name the toxin(s)__
Superantigens (staphylococcus enterotoxins and streptococcal pyrogenic exotoxins,
Please attach information, such as a Material Safety Data Sheet, for the toxin(s) used.
See attachment

8.3 What is the LD_{50} (specify species) of the toxin___
Human (unknown, most mice are very resistant, specific strains is 100ug, rabbit 500ug)_____

8.4 How much of the toxin is handled at one time*? _____1mg_____

8.5 How much of the toxin is stored*? _____5mg _____

8.6 Will any biological toxins be used in live animals? X YES, Please provide details:__ Superantigens (staphylococcus enterotoxins and streptococcal pyrogenic exotoxins, (See MSDS Attachement 6)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 X NO
If no, please proceed to Section 10.0

9.2 If YES, please give the name of the species. _____

9.3 What is the origin of the insect? _____

9.4 What is the life stage of the insect? _____

9.5 What is your intention? O Initiate and maintain colony, give location: _____
O "One-time" use, give location: _____

9.6 Please describe the risk (if any) of escape and how this will be mitigated:
_____
_____
_____

9.7 Please attach the CFIA permit.

9.8 Please describe any CFIA permit conditions:

10.0 Plants Requiring CFIA Permits

10.1 Do you use plants that require a permit from the CFIA? O YES X NO
If no, please proceed to Section 11.0

10.2 If YES, please give the name of the species. _____

10.3 What is the origin of the plant? _____

10.4 What is the form of the plant (seed, seedling, plant, tree...)? _____

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

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? O YES, please give country of origin_____
If no, please proceed to Section 12.0 X NO

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

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

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

12.0 Training Requirements for Personnel Named on Form

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

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

As the Principal Investigator, I have ensured that all of the personnel named on the form who will be using any of the biohazardous agents in Sections 1.0 to 9.0 have been trained. See Attachment 7

SIGNATURE _____

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 X 2 O 3

13.2 Has the facility been certified by OHS for this level of containment?
X YES, permit # if on-campus___BIO-UWO-155___
O NO, please certify
O NOT REQUIRED for Level 1 containment

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

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: Joshua Wilson Date: 7 June 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.

_____No additional risks beyond containment level 2.
Public Health Agency of Canada conditions will be followed as described in Attachment 3 for Imported pathogens._____

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

1. Educate persons working with needles and/or animals that all needlesick injuries and animal bites are potentially serious and require immediate First Aid.
2. The needlestick and/or bite wound should be washed immediately in warm soapy water.
3. If the wound is bleeding, attempt to encourage bleeding by expressing the wounded area.
4. After washing, cover the wound with a dry sterile dressing
5. Go to Workplace Health, Room 25, University Community Centre (UCC) for further assessment and treatment. After hours go to University Hospital Emergency Department. Write up a incident report for Workplace Health Review
6. Educate self and staff to prevent future incident.

15.0 Approvals

UWO Biohazard Subcommittee: SIGNATURE: _____
Date: 21 June 2010

Safety Officer for Institution where experiments will take place: SIGNATURE: J Stanley
Date: June 11, 2010

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

Approval Number: BIO-UWO-0155 Expiry Date (3 years from Approval): 20 June 2013

Special Conditions of Approval:

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

Introduction. Bacterial superantigens (SAgs) are potent T cell mitogens that are implicated in the pathogenesis of toxic shock syndrome, scarlet fever, and other immunological disorders such as Kawasaki disease. SAgs activate large numbers of T cells by circumventing conventional antigen presentation through direct binding to unconventional regions of both MHC class II molecules and TCR β-chains (Vβs). The central hypothesis of this research proposal is that bacterial SAgs play a key role in the pathogenesis of *Streptococcus pyogenes*, and that direct inhibition of SAg function will be effective for the treatment of severe streptococcal disease. The specific aims of this grant proposal are to:

I. Determine if the CDR2 loop of TCR β-chains (CDR2β) is the critical determinant of bacterial superantigen Vβ specificity. The molecular "rules" that dictate why SAgs are Vβ-specific are not known. All current structural data indicates that although evolutionary distinct SAgs bind with distinct architectures to their specific TCR Vβ targets, the one uniform feature is that all SAgs engage the CDR2β loop. Our preliminary data has indicated that at least for Group V SAgs, the CDR2 contacts determine Vβ-specificity, while more peripheral contacts are important for stabilization, but not for specificity. In this specific aim, we will graft the CDR2 loops from 6 human β-chains (including Vβs 4.1, 5.1, 6.7a, 8.1, 17.1 and 21.3) onto human Vβ2.1, and using Hut78 T cells we will functionally determine if Vβ-specificity is governed by the CDR2 loop for a diverse panel of SAgs representative for each of the five distinct evolutionary SAg Groups.

II. Evaluate engineered SAg-knockout strains of *Streptococcus pyogenes* for their colonization phenotype, and ability to induce severe streptococcal disease and Kawasaki disease. Although the role of bacterial SAgs in toxic shock syndrome is clear, the true evolutionary function of these toxins remains a major mystery in our understanding of SAg-biology. In this specific aim, we will evaluate the role that SAgs play for bacterial survival and invasion in both colonization and severe disease models. We are conducting systematic mutagenesis in *S. pyogenes* strain MGAS8232 to create inframe, markerless deletions of all 6 SAgs encoded within MGAS8232. Wild-type MGAS8232 and isogenic mutants with individual, multiple, and complete deletions of all SAgs, will be comprehensively evaluated in three separate MHC class II humanized mouse models for the ability to i) colonize nasal-associate lymphoid tissue; and to cause severe disease in models of ii) bacteremia and iii) Kawasaki disease. In the colonization model we propose that SAgs actually function to prevent systemic spread of *S. pyogenes*, whereas they are critical for pathogenesis in both of the severe disease models.

III. Develop and test soluble high-affinity binding inhibitors for key streptococcal SAgs for use as antagonists in severe streptococcal disease. Streptococcal toxic shock syndrome is an extremely dangerous complication of invasive streptococcal disease. In this specific aim, we will first test soluble Vβs engineered for high-affinity for the two streptococcal SAgs (SpeA and SpeC) believed to be the most clinically relevant SAgs, and depending on Specific Aim II we will further develop additional inhibitors using a characterized yeast display system. Targeted mutagenesis will be based on findings from Specific Aim I. Second, we propose to develop *Lactococcus lactis* as a platform for structure-function analysis and engineering of MHC class II molecules. Synthetic constructs have been generated to express HLA-DR4 as a single-chain MHC class II (scMHCII) molecule that is secreted and anchored to the *L. lactis* cell wall. The scMHCII molecule will be mutated and selected for "affinity maturation" by multiple rounds by FACS for high-affinity binding to fluorescent SpeA or SpeC. Candidate soluble inhibitors will tested for neutralization activity *in vivo* in the bacteremia and Kawasaki disease models from Specific Aim II.

Significance. These experiments are designed to address our overall hypothesis and to provide a much broader picture of SAg biology, while at the same time laying new foundations for novel treatments of severe streptococcal disease.

Attachment 2

Personal identification no. (PIN)	Family name of applicant
182110	McCormick

SUMMARY OF PROPOSAL FOR PUBLIC RELEASE (Use plain language.)

This plain language summary will be available to the public if your proposal is funded. Although it is not mandatory, you may choose to include your business telephone number and/or your e-mail address to facilitate contact with the public and the media about your research.

Business telephone no. (optional): (519) 646-6100 Ext. 64134

E-mail address (optional): jmccormi@lri.sjhc.london.on.ca

The term "probiotic" has been reserved for a group of bacteria, typically Lactobacillus species, that when delivered or consumed can produce a health benefit to the mammalian host. Despite great promise and enthusiasm in using probiotics for human and animal health, specific mechanisms as to how these bacteria provide their proposed benefits are generally scarce. This project is designed to understand the role of a protein expressed on the surface of the bacterium Lactobacillus fermentum in promoting colonization of the bacteria. This protein is normally involved in the uptake of the amino acid cysteine, an important physiological function. However, multiple research groups, including ours, have shown that this protein when purified can also bind to collagen, an important and abundant component of human and animal tissue. We believe that this protein plays a role in promoting colonization of the bacteria in the intestinal and vaginal tracts by acting as a bride to bind the bacteria to the host tissue. The research will use multiple strategies to determine which specific regions of the protein are actually responsible for collagen binding. Furthermore, using genetically constructed strains, we will determine the contribution of this protein in colonization by "knocking out" the gene in L. fermentum, and also assessing its function in a bacteria that does not contain the gene (Lactococcus lactis). Finally, we will determine the defined cellular location of the protein using various antibody and fluorescence based techniques, and establish if the protein can compete with pathogenic bacteria such as Staphylococcus aureus for binding to collagen.

Second Language Version of Summary (optional).

Public Health Agency of Canada

Centre for Emergency Preparedness and Response

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permit no.-Permis no.

P- 13809

Attachments 3

Permit to import human pathogen(s)

Permis d'importation d'agent(s) anthropopathogène(s)

Under the authority of the Human Pathogens Importation Regulations.

Sous le régime du Règlement sur l'importation des agents anthropopathogènes.

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal

Facsimile-Télécopieur

Telephone no.- No. de téléphone

The University of Western Ontario
Schulich School of Medicine & Dentristry
Dept. of Microbiology and Immunology
Dental Sciences Building Rm. 3014
London, ON N6A 5C1 Attn.: Dr. John McCormick

(519) 661-3499

(519) 661-3309

Supplier-Name and address - **Fournisseur**-Nom et adresse

Kaiser Permanente, Stapleton Support Services
Microbiology Lab, 1100E. 45th Avenue
Denver, Colorado 80239-3004, USA

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Various ports

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Group G Streptococcus* (human clinical isolate).

*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation -
*Les agents anthropopathogènes indiqués sur ce permis doivent aussi être accompagnés d'un permis d'importation de l'ACIA.

On the following terms and conditions as marked:-Selon les conditions indiquées:

1. Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	■	Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
2. Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	■	Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée.
3. All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	☐	Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs.
4. All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated.	■	L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés.
5. Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	☐	Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés.
6. No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■	La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7. On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	☐	Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
8. Primary isolation, identification and/or manipulation may be done in level 2 containment (physical requirements) using containment level 3 operational requirements.	☐	On peut accomplir l'isolation, l'identification primaire, et/ou la manipulation au niveau de confinement 2 (exigences physiques) en utilisant les exigences opérationnelles de niveau de confinement 3.
9. NO IMPORTED MATERIAL MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	☐	AUCUNE MATIÈRE IMPORTÉE NE PEUT ÊTRE TRANSPORTÉE, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MISE EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
10. The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2.	☐	Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.
11. No culturing of Risk Group 3 pathogens shall be done.	☐	Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise.

12. **This permit is valid only for:** ☐ a) a single entry into Canada **or**

London, ON N6A 5C1 Attn.: Dr. John McCormick

Supplier-Name and address - **Fournisseur**-Nom et adresse

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Microbiology Lab, 1100E. 45th Avenue
Denver, Colorado 80239-3004, USA

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

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Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Group G Streptococcus* (human clinical isolate).

*Pathogen(s) indicated on this permit also require an accompanying valid CFIA permit for importation -
*Les agents anthropopathogènes indiqués sur ce permis doivent aussi être accompagnés d'un permis d'importation de l'ACIA.

On the following terms and conditions as marked:-Selon les conditions indiquées:

1.	Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	■ Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
2.	Domestic animals, including poultry, cattle, sheep, swine and horses, shall not be directly or indirectly exposed to infection by any of the imported material.	■ Les animaux domestiques, y compris les volailles, bovins, ovins, porcins et chevaux, ne doivent pas être exposés, directement ou indirectement, à l'infection par la matière importée.
3.	All animals exposed to infection by any of the imported material shall be so exposed and held only in isolated insect-and rodent-proof facilities.	☐ Les animaux exposés à l'infection par la matière importée doivent y être exposés et être gardés uniquement dans des installations isolées à l'abri des insectes et des rongeurs.
4.	All equipment, animal pens, cages, bedding, waste and other articles under the importer's control, that come in direct or indirect contact with any of the imported material, shall be sterilized by autoclaving or incinerated.	■ L'équipement, les enclos pour animaux, les cages, les litières, les déchets et tout autre article sous la responsabilité de l'importateur qui viennent en contact direct ou indirect avec la matière importée doivent être stérilisés par autoclavage ou incinérés.
5.	Packaging materials, containers and all unused portions of the imported material shall be sterilized by autoclaving or incinerated.	☐ Le matériel d'emballage, les récipients et toute partie inutilisée de la matière importée doivent être stérilisés par autoclavage ou incinérés.
6.	No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■ La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7.	On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	☐ Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
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10.	The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2.	☐ Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.
11.	No culturing of Risk Group 3 pathogens shall be done.	☐ Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise.

12. **This permit is valid only for:** / **Le présent permis n'est valide que pour:**

☐ a) a single entry into Canada **or** / une seule entrée au Canada **ou**

■ b) importations at intervals of / les importations effectuées à intervalles de during the period beginning on / au cours de la période commençant le and ending on / et se terminant le

Authorization-Signature of Director
Autorisation-Signature du Directeur

Marianne Heisz

Date

cc: Paul J. Payette, Ph.D.

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that those laws apply in respect of that material.

Nota : Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

Public Health Agency of Canada

Centre for Emergency Preparedness and Response

Agence de santé publique du Canada
Centre de mesures et d'interventions d'urgence

Permit no.-Permis no.

P- 13810

Permit to import human pathogen(s)

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Under the authority of the Human Pathogens Importation Regulations.

Sous le régime du Règlement sur l'importation des agents anthropopathogènes.

Importer-Name, address and postal code - **Importateur**-Nom, adresse et code postal

Facsimile-Télécopieur

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Dental Sciences Building Rm. 3014
London, ON N6A 5C1 Attn.: Dr. John McCormick

(519) 661-3499

(519) 661-3309

Supplier-Name and address - **Fournisseur**-Nom et adresse

American Type Culture Collection
10801 University Blvd.
Manassas, VA 20108 USA

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Various ports

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Streptococcus pyogenes (ATCC #s: BAA-572, BAA-595, BAA-947).

On the following terms and conditions as marked:-Selon les conditions indiquées:

1. Work involving any of the imported material shall be limited to *in vitro* laboratory studies.	■	Les travaux auxquels la matière importée est destinée doivent se limiter à des études de laboratoire *in vitro*.
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7. On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	☐	Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
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10. The Director must approve all new work with the imported material involving construction of recombinants that requires an increase of containment from level 2.	☐	Tous nouveaux travaux de manipulation génétique (recombiné) avec la matière importée qui demandera que le niveau 2 de confinement soit augmenté exigera l'approbation du Directeur.
11. No culturing of Risk Group 3 pathogens shall be done.	☐	Aucune culture d'agent anthropopathogène du Groupe de risque 3 ne sera entreprise.

12. **This permit is valid only for:** / **Le présent permis n'est valide que pour:**

☐ a) a single entry into Canada **or** / une seule entrée au Canada **ou**

■ b) importations at intervals of during the period beginning on and ending on

London, ON N6A 5C1 Attn.: Dr. John McCormick

Supplier-Name and address - **Fournisseur**-Nom et adresse

American Type Culture Collection
10801 University Blvd.
Manassas, VA 20108 USA

Name(s) of Port(s) of Entry- To Clear Customs at Port(s) of entry
Nom(s) de(s) point(s) d'entrée -Dédouanement au(x) point(s) d'entrée

Various ports

Description of Pathogen(s)-For the importation of- **Description de(s) agent(s) anthropopathogène(s)**-Pour l'importation de

Streptococcus pyogenes (ATCC #s: BAA-572, BAA-595, BAA-947).

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6. No work on the imported material shall be done, except work conducted or directed by the importer in the facilities described in the application for this permit. NO HUMAN PATHOGEN BELONGING TO RISK GROUP 3 OR 4 MAY BE REMOVED TO ANOTHER LOCATION, OR TRANSFERRED INTO THE POSSESSION OF A PERSON OTHER THAN THE IMPORTER, WITHOUT THE PERMISSION OF THE DIRECTOR.	■	La matière importée ne peut servir qu'aux travaux effectués ou dirigés par l'importateur dans les installations décrites dans la demande de permis. AUCUNE AGENT ANTHROPOPATHOGÈNE DU GROUPE DE RISQUE 3 OU 4 NE PEUT ÊTRE TRANSPORTÉ, SANS LA PERMISSION DU DIRECTEUR, VERS UN AUTRE LIEU OU ÊTRE MIS EN LA POSSESSION D'UNE AUTRE PERSONNE QUE L'IMPORTATEUR.
7. On completion of the importer's work involving the imported human pathogen, the pathogen and all its derivatives shall be destroyed.	☐	Au terme des travaux de l'importateur auxquels a servi l'agent anthropopathogène importé, celui-ci et tous ses dérivés doivent être détruits.
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■ b) importations at intervals of / les importations effectuées à intervalles de during the period beginning on / au cours de la période commençant le and ending on / et se terminant le

Authorization-Signature of Director
Autorisation-Signature du Directeur

cc: Paul J. Payette, Ph.D.

Marianne Heisz

Date

Note: Transporting and otherwise dealing with imported material are subject to federal, provincial and municipal laws (if any), to the extent that, those laws apply in respect of that material.

Nota : Les opérations relatives à la matière importée, y compris le transport, sont assujetties aux lois fédérales, provinciales et aux règlements municipaux applicables.

Canada

Attachments 4

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

NAME: ***Staphylococcus aureus***

SYNONYM OR CROSS REFERENCE: Staphylococcal diseases, impetigo, toxic shock syndrome, food poisoning, intoxication

CHARACTERISTICS: Gram positive cocci, usually in clusters; coagulase positive; non-spore forming; non-motile; many strains produce exotoxins including staphylococcal enterotoxins A,B,C,D,E, toxic shock syndrome toxin (TSST-1) and exfoliative toxins A, and B

PATHOGENICITY: Opportunistic pathogen, normal flora; produces a variety of syndromes with a range of clinical manifestations; clinically different in general community, newborns, menstruating women, and hospitalized patients; food intoxication is characterized by abrupt/violent onset, severe nausea, cramps, vomiting, and diarrhea using lasting 1-2days; animal bites can result in localized infections; may cause surface or deep/system infections in both community and hospital settings; surface infections include impetigo, folliculitis, abscesses, boils, infected lacerations; deep infections include endocarditis, meningitis, septic arthritis, pneumonia, osteomyelitis; systemic infection may cause fever, headache malaise, myalgia; newborns are susceptible to scalded skin syndrome (SSS) caused by exfoliative toxins; my be colonized during delivery resulting in sepsis meningitis; toxic shock syndrome is an acute multi-system illness caused by TSST-1 a super antigen; characterized by sudden onset, high fever, vomiting, profuse watery diarrhea, myalgia, hypotension erythematous rash

EPIDEMIOLOGY: Occurs worldwide; particularly in areas where personal hygiene is suboptimal; in hospitals by development of antibiotic-resistant strains

HOST RANGE: Humans; to a lesser extent, warm-blooded animals

INFECTIOUS DOSE: Virulence of strains varies greatly

MODE OF TRANSMISSION: Contact with nasal carriers (30-40% of population); from draining lesions or purulent discharges; spread person-to-person; ingestion of food containing staphylococcal enterotoxin (food may be contaminated by food handlers hands); from mother to neonate during delivery

INCUBATION PERIOD: Variable and indefinite, commonly 4-10 days; disease may not occur until several months after colonization; interval between eating food and onset of symptoms is usually 2-4 hours (30 min to 8 hours)

COMMUNICABILITY: As long as purulent lesions continue to drain or carrier state persists; auto-infection may continue for the period of nasal colonization or duration of active lesions

RESERVOIR: Human; patients with indwelling catheters or IVs act as reservoirs for nosocomial infections; food borne - occasionally cows with infected udders

ZOONOSIS: Yes - direct or indirect contact with infected animals

VECTORS: None

DRUG SUSCEPTIBILITY: Many strains are multi-resistant to antibiotics and are of increasing importance; methicillin resistant (MRSA) strains have caused major outbreaks world-wide; Vancomycin resistant (VRSA) are being increasingly isolated; sensitivity must be determined for each strain

SUSCEPTIBILITY TO DISINFECTANTS: Susceptible to many disinfectants - 1% sodium hypochlorite, iodine/alcohol solutions, glutaraldehyde, formaldehyde

PHYSICAL INACTIVATION: Organisms are destroyed by heat (moist heat - 121° C for at least 15 min, dry heat - 160-170° C for at least 1 hour; enterotoxins are heat resistant, stable at boiling temperature

SURVIVAL OUTSIDE HOST: Carcass and organs - up to 42 days; floor - less than 7 days; glass - 46 hours; sunlight - 17 hours; UV - 7 hours; meat products - 60 days; coins - up to 7 days; skin from 30 min to 38 days

SURVEILLANCE: Monitor for skin inflammation if wounded by a sharp instrument; isolation of organism from wound or blood, CSF, urine; isolation of> 10^5 organisms or enterotoxin from suspected food

FIRST AID/TREATMENT: Fluid replacement for food poisoning; in localized skin infections, drain abscesses; antibiotic therapy for severe infections

IMMUNIZATION: None

PROPHYLAXIS: None

LABORATORY-ACQUIRED INFECTIONS: 29 reported cases up to 1973 with 1 death

SOURCES/SPECIMENS: Clinical specimens - blood, abcesses, lesion exudates, CSF, respiratory specimens, feces, urine

PRIMARY HAZARDS: Injuries from contaminated sharp instruments; ingestion; aerosols

SPECIAL HAZARDS: Direct contact with open cuts and lesions of skin

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

PROTECTIVE CLOTHING: Laboratory coat: gloves when skin contact is unavoidable

OTHER PRECAUTIONS: Thorough handwashing before leaving the laboratory and after handling infectious materials

SPILLS: Allow aerosols to settle; wear protective clothing; gently cover spill with paper towel 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

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.

Date Modified: 2001-04-23

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

NAME: ***Streptococcus pyogenes***

SYNONYM OR CROSS REFERENCE: Group A (Beta hemolytic) streptococci, streptococcal sore throat, scarlet fever, impetigo, erysipelas, puerperal fever, necrotizing facsciitis

CHARACTERISTICS: Gram-positive cocci occurring in pairs or chains, facultatively anaerobic, nonmotile, beta hemolysis on blood agar; 80 serologically distinct types

PATHOGENICITY: Cause a variety of diseases; streptococcal sore throat (fever, exudative tonsillitis, pharyngitis), streptococcal skin infections (impetigo or pyoderma - usually superficial), scarlet fever (skin rash, fever, nausea, case fatality rate of 3%), puerperal fever (bacterial invasion of genital tract), septicemia, erysipelas (fever, leukocytosis, red spreading lesion), perianal cellulitis, mastoiditis, otitis media, pneumonia, peritonitis and wound infections; acute glomerulonephritis may result; acute rheumatic fever; toxic shock-like syndrome (hypotension, renal impairment, thrombocytopenia, disseminated intravascular coagulation, bilirubin elevation, adult respiratory distress syndrom, necrotizing fasciitis; necrotizing fasciitis is a serious, often fatal, rare infection of the skin and subcutaneous tissue characterized by swelling, appearance of violet colour, blister formation, fever; serious cases progress rapidly with high mortality

EPIDEMIOLOGY: Common in temperate zones, well recognized in semitropics and less frequently recognized in tropical climates; in North America, may be endemic, epidemic or sporadic; highest incidence during late winter and spring; 3-15 year age group most often affected; impetigo occurs in young children in late summer and fall in hot climates; erysipelas most common after 20 years of age and in infants (sporadic occurrence); *Streptococcus pharyngitis* is unusual under 3 years of age, peaks in age group 6-12

HOST RANGE: Humans

INFECTIOUS DOSE: Not known

MODE OF TRANSMISSION: Large respiratory droplets, direct or intimate contact with patient or carrier (especially nasal); rarely by indirect contact through objects or hands; organisms may be recovered from skin 1-2 weeks before impetigo lesions and same strain appears in throat late in course of skin infection; anal, vaginal, skin and pharyngeal carriers responsible for noscomial outbreaks of wound infections; dried streptococci in dust etc. viable but non-infectious for mucous membranes or intact skin; group A streptococci may be transmitted to cattle from human carriers then spread through raw milk from these cattle; ingestion of contaminated foods (milk products, eggs) may result in explosive outbreaks; necrotizing fasciitis more often begins with skin infection at site of minor wounds or punctures

INCUBATION PERIOD: Short; usually 1-3 days, rarely longer

COMMUNICABILITY: In untreated uncomplicated cases period of communicability is 10-21 days; in untreated conditions with purulent discharges, period may extend to weeks or months; with adequate

treatment, transmissibility generally is terminated within 24-48 hours; streptococcal pharyngitis is contagious for 2- 3 weeks if untreated

RESERVOIR: Humans

ZOONOSIS: None

VECTORS: None

DRUG SUSCEPTIBILITY: Sensitive to penicillin (benzathine penicillin G); clindamycin or a cephalosporin can be used when penicillin and erythromycin are contraindicated

DRUG RESISTANCE: Resistant to tetracyclines; macrolide-resistant strains in the increase

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

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: Dust - up to 195 days; flies caught in hospital carried organism on their feet; survives in milk at 20 to 37° C; cheese - up to 126 days; pus - up to 110 days; blankets - 120 days; rim of drinking glass - 2 days

SURVEILLANCE: Monitor for symptoms; confirm by bacteriological and serological testing

FIRST AID/TREATMENT: Antibiotic therapy with penicillin (erythromycin for penicillin-sensitive patients); necrotizing fasciitis - early medical treatment critical (penicillin along with aggressive surgical debridement), limb amputation may be necessary in advanced cases

IMMUNIZATION: None

PROPHYLAXIS: Administer penicillin (long-term prophylaxis with long-acting benzathine penicillin G for persons whom recurrent streptococcal infections constitutes a special risk)

LABORATORY-ACQUIRED INFECTIONS: 78 recorded cases with 4 deaths up to 1976; 5th most common laboratory acquired infection

SOURCES/SPECIMENS: Respiratory specimens, skin lesions, blood, urine, wound exudates (pus etc.)

PRIMARY HAZARDS: Inhalation of infectious aerosols; accidental parenteral inoculation; ingestion; direct contact of mucous membranes and skin lesions

SPECIAL HAZARDS: None

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

PROTECTIVE CLOTHING: Laboratory coat; gloves when contact with infectious materials in unavoidable

OTHER PRECAUTIONS: None

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel 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

Date prepared: June, 2001

Prepared by: Office of Laboratory Security, PHAC

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Date Modified: 2001-09-26

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

NAME: *Lactobacillus* spp.

SYNONYM OR CROSS REFERENCE: *L. acidophilus, L. bifidus, L.bulgaricus, L. casei, L. viridescens, L. helveitcus, L. plantarum*

CHARACTERISTICS: Gram-positive large rods, non-spore forming, anaerobic or microaerophilic, occur singly or in pairs

PATHOGENICITY: Very rarely pathogenic; part of normal flora in man and animals (mouth, vagina, and intestinal tract); in the oral cavity, associated with dental caries but no known etiologic role; have been reported to cause endocarditis, neonatal meningitis and bacteremia

EPIDEMIOLOGY: Worldwide

HOST RANGE: Normal flora of humans and animals

INFECTIOUS DOSE: Not known

MODE OF TRANSMISSION: Not known

INCUBATION PERIOD: Not known

COMMUNICABILITY: Not transmitted from person-to-person

RESERVOIR: Widespread in nature, humans and animals

ZOONOSIS: None

VECTORS: None

DRUG SUSCEPTIBILITY: Susceptible to antibiotics

DRUG RESISTANCE: vancomycin-resistant strains have been isolated

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

PHYSICAL INACTIVATION: Susceptible 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 - 2 days; cheese - 105 years;

SURVEILLANCE: None

FIRST AID/TREATMENT: Wash area in contact with warm water and soap (omit soap for mucous membrane exposure); drug therapy (penicillin and aminoglycosides)

IMMUNIZATION: None

PROPHYLAXIS: None

LABORATORY-ACQUIRED INFECTIONS: No reported cases of laboratory infections with *Lactobacillus* spp.

SOURCES/SPECIMENS: Dairy products and other food, feces, specimens from the mouth, vaginal swabs

PRIMARY HAZARDS: Hazard of infection from this organism is low, however, it is prudent to avoid accidental inoculation and ingestion

SPECIAL HAZARDS: None

CONTAINMENT REQUIREMENTS: No special design features beyond those suitable for a well designed and functional laboratory with good microbiology practices; this level of containment does not allow for any additional risk that may present for those persons with pre-existing disease, compromised immunity or who are pregnant

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

OTHER PRECAUTIONS: None

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel 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

Date prepared: March, 2001

Prepared by: Office of Laboratory Security, PHAC

Date Modified: 2001-04-23

Conforms to ANSI Z400.5-2004 Standard (United States).

Material Safety Data Sheet

Agilent Technologies

Stratagene XL1-Blue MR Competent Cells, Catalog #200229

1. Product and company identification

Product name	:	**Stratagene XL1-Blue MR Competent Cells, Catalog #200229**
Part No.	:	XL1-Blue MR competent cells 200229-41 pUC18 Control Plasmid DNA 200231-42 1.42 M 2-Mercaptoethanol 210200-43
Manufacturer / Supplier	:	Agilent Technologies, Inc. 1834 State Highway 71 West Cedar Creek, TX 78612
Emergency telephone number	:	1-800-894-1304
Use of the substance/preparation	:	Chemical Kit
Validation date	:	01/09/2009

2. Hazards identification

Physical state	:	XL1-Blue MR competent cells	Liquid.
		pUC18 Control Plasmid DNA	Liquid.
		1.42 M 2-Mercaptoethanol	Liquid.
Odor	:	XL1-Blue MR competent cells	Not available.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.
OSHA/HCS status	:	XL1-Blue MR competent cells	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
		pUC18 Control Plasmid DNA	While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this MSDS contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.
		1.42 M 2-Mercaptoethanol	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview-Signal Word	:	WARNING !	
Emergency overview-Label Statement	:	XL1-Blue MR competent cells	HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
		pUC18 Control Plasmid DNA	NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
		1.42 M 2-Mercaptoethanol	HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.

2. Hazards identification

	XL1-Blue MR competent cells	Toxic if swallowed. Avoid exposure - obtain special instructions before use. Do not breathe vapor or mist. Do not ingest. Avoid contact with eyes, skin and clothing. Contains material that may cause target organ damage, based on animal data. Wash thoroughly after handling.
	pUC18 Control Plasmid DNA	No known significant effects or critical hazards. Avoid prolonged contact with eyes, skin and clothing.
	1.42 M 2-Mercaptoethanol	Toxic if swallowed. Irritating to eyes and skin. May cause sensitization by skin contact. Do not breathe vapor or mist. Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Wash thoroughly after handling.
	XL1-Blue MR competent cells	Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
	pUC18 Control Plasmid DNA	Not available.
	1.42 M 2-Mercaptoethanol	Not available.
Routes of entry :	XL1-Blue MR competent cells	Inhalation. Ingestion.
	pUC18 Control Plasmid DNA	Eye contact. Ingestion.
	1.42 M 2-Mercaptoethanol	Dermal contact. Eye contact. Inhalation. Ingestion.
Potential acute health effects		
Eyes :	XL1-Blue MR competent cells	No known significant effects or critical hazards.
	pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
	1.42 M 2-Mercaptoethanol	Irritating to eyes.
Skin :	XL1-Blue MR competent cells	No known significant effects or critical hazards.
	pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
	1.42 M 2-Mercaptoethanol	Irritating to skin. May cause sensitization by skin contact.
Inhalation :	XL1-Blue MR competent cells	No known significant effects or critical hazards.
	pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
	1.42 M 2-Mercaptoethanol	No known significant effects or critical hazards.
Ingestion :	XL1-Blue MR competent cells	Toxic if swallowed.
	pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
	1.42 M 2-Mercaptoethanol	Toxic if swallowed.
Medical conditions aggravated by over-exposure :	XL1-Blue MR competent cells	Repeated or prolonged exposure to the substance can produce target organs damage.
	pUC18 Control Plasmid DNA	Not applicable.
	1.42 M 2-Mercaptoethanol	Repeated skin exposure can produce local skin destruction or dermatitis. Repeated or prolonged contact with spray or mist may produce chronic eye irritation and severe skin irritation.
Over-exposure signs/symptoms :	XL1-Blue MR competent cells	Not applicable.
	pUC18 Control Plasmid DNA	Not applicable.
	1.42 M 2-Mercaptoethanol	Not applicable.

See toxicological information (section 11)

3 . Composition/information on ingredients

Name	CAS number	%
XL1-Blue MR competent cells		
Glycerol	56-81-5	5 - 10
Manganese dichloride	7773-01-5	5 - 10
Sucrose	57-50-1	5 - 10
Dimethyl sulfoxide	67-68-5	5 - 10
Potassium chloride	7447-40-7	1 - 5
1.42 M 2-Mercaptoethanol		
2-Mercaptoethanol	60-24-2	10

There are no ingredients or additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First aid measures

Eye contact	: XL1-Blue MR competent cells	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
	1.42 M 2-Mercaptoethanol	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if adverse health effects persist or are severe.
Skin contact	: XL1-Blue MR competent cells	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
	1.42 M 2-Mercaptoethanol	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if adverse health effects persist or are severe.
Inhalation	: XL1-Blue MR competent cells	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
	pUC18 Control Plasmid DNA	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.
	1.42 M 2-Mercaptoethanol	If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention if adverse health effects persist or are severe.

4. First aid measures

Ingestion	:	XL1-Blue MR competent cells	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
		pUC18 Control Plasmid DNA	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
		1.42 M 2-Mercaptoethanol	Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if adverse health effects persist or are severe.
Protection of first-aiders	:	XL1-Blue MR competent cells	Not applicable.
		pUC18 Control Plasmid DNA	Not applicable.
		1.42 M 2-Mercaptoethanol	Not applicable.
Notes to physician	:	No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.	

5. Fire-fighting measures

Flammability of the product	:	XL1-Blue MR competent cells	Non-flammable.
		pUC18 Control Plasmid DNA	Non-flammable.
		1.42 M 2-Mercaptoethanol	Combustible.
Products of combustion	:	XL1-Blue MR competent cells	Decomposition products may include the following materials: carbon oxides sulfur oxides halogenated compounds metal oxide/oxides
		pUC18 Control Plasmid DNA	No specific data.
		1.42 M 2-Mercaptoethanol	Decomposition products may include the following materials: carbon oxides sulfur oxides

Extinguishing media

Suitable	:	XL1-Blue MR competent cells	Use an extinguishing agent suitable for the surrounding fire.
		pUC18 Control Plasmid DNA	Use an extinguishing agent suitable for the surrounding fire.
		1.42 M 2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire.
Not suitable	:	XL1-Blue MR competent cells	Not applicable.
		pUC18 Control Plasmid DNA	Not applicable.
		1.42 M 2-Mercaptoethanol	Not applicable.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.	
Special remarks on fire hazards	:	XL1-Blue MR competent cells	Not available.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.
Special remarks on explosion hazards	:	Not available.	

6 . Accidental release measures

Personal precautions	:	XL1-Blue MR competent cells	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
		pUC18 Control Plasmid DNA	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
		1.42 M 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
Environmental precautions	:	XL1-Blue MR competent cells	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
		pUC18 Control Plasmid DNA	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
		1.42 M 2-Mercaptoethanol	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Methods for cleaning up			
Small spill	:	XL1-Blue MR competent cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
		pUC18 Control Plasmid DNA	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
		1.42 M 2-Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

7 . Handling and storage

Handling	:	XL1-Blue MR competent cells	Do not ingest. Wash thoroughly after handling.
		pUC18 Control Plasmid DNA	Wash thoroughly after handling.
		1.42 M 2-Mercaptoethanol	Do not ingest. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

7 . Handling and storage

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8 . Exposure controls/personal protection

Product name	Exposure limits
United States	
XL1-Blue MR competent cells	
Glycerol	**ACGIH TLV (United States, 1/2008).** TWA: 10 mg/m³ 8 hour(s). Form: Mist **OSHA PEL (United States, 11/2006).** TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 15 mg/m³ 8 hour(s). Form: Total dust **OSHA PEL 1989 (United States, 3/1989).** TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction TWA: 10 mg/m³ 8 hour(s). Form: Total dust
Manganese dichloride	**ACGIH TLV (United States, 1/2008).** TWA: 0.2 mg/m³, (as Mn) 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).** CEIL: 5 mg/m³, (as Mn) **NIOSH REL (United States, 12/2001).** TWA: 1 mg/m³, (as Mn) 10 hour(s). STEL: 3 mg/m³, (as Mn) 15 minute(s). **OSHA PEL (United States, 11/2006).** CEIL: 5 mg/m³, (as Mn)
Sucrose	**ACGIH TLV (United States, 1/2008).** TWA: 10 mg/m³ 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).** TWA: 15 mg/m³ 8 hour(s). Form: Total dust TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction **NIOSH REL (United States, 12/2001).** TWA: 10 mg/m³ 10 hour(s). Form: Total TWA: 5 mg/m³ 10 hour(s). Form: Respirable fraction **OSHA PEL (United States, 11/2006).** TWA: 15 mg/m³ 8 hour(s). Form: Total dust TWA: 5 mg/m³ 8 hour(s). Form: Respirable fraction
Dimethyl sulfoxide	**AIHA WEEL (United States, 1/2008).** TWA: 250 ppm 8 hour(s).
1.42 M 2-Mercaptoethanol	
2-Mercaptoethanol	**AIHA WEEL (United States, 1/2008).** TWA: 0.2 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Engineering measures : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.

Skin : Chemical resistant protective gloves and clothing are recommended. The choice of protective gloves or clothing must be based on chemical resistance and other use requirements. Generally, BUNA-N offers acceptable chemical resistance. Individuals who are acutely and specifically sensitive to this chemical may require additional protective clothing.

8 . Exposure controls/personal protection

Respiratory	:	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Hands	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Other protection	:	Not available.
Hygiene measures	:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

9 . Physical and chemical properties

Physical state	:	XL1-Blue MR competent cells	Liquid.
		pUC18 Control Plasmid DNA	Liquid.
		1.42 M 2-Mercaptoethanol	Liquid.
Flash point	:	XL1-Blue MR competent cells	Not applicable.
		pUC18 Control Plasmid DNA	Not applicable.
		1.42 M 2-Mercaptoethanol	Not applicable.
Color	:	XL1-Blue MR competent cells	Not available.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.
Odor	:	XL1-Blue MR competent cells	Not available.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.
pH	:	XL1-Blue MR competent cells	Not available.
		pUC18 Control Plasmid DNA	Neutral.
		1.42 M 2-Mercaptoethanol	Neutral.
Boiling/condensation point	:	XL1-Blue MR competent cells	Lowest known value: 100°C (212°F) (Water). Weighted average: 122.01°C (251.6°F)
		pUC18 Control Plasmid DNA	Lowest known value: 100°C (212°F) (Water).
		1.42 M 2-Mercaptoethanol	Lowest known value: 100°C (212°F) (Water). Weighted average: 105.7°C (222.3°F)
Melting/freezing point	:	XL1-Blue MR competent cells	May start to solidify at the following temperature: 19.8°C (67.6°F) This is based on data for the following ingredient: Glycerol. Weighted average: 3.02°C (37.4°F)
		pUC18 Control Plasmid DNA	May start to solidify at the following temperature: 0°C (32°F) This is based on data for the following ingredient: Water.
		1.42 M 2-Mercaptoethanol	May start to solidify at the following temperature: 0°C (32°F) This is based on data for the following ingredient: Water.
Relative density	:	XL1-Blue MR competent cells	Weighted average: 1.29 (Water = 1)
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Only known value: 1.1 (Water = 1) (2-Mercaptoethanol).

9 . Physical and chemical properties

Vapor pressure	:	XL1-Blue MR competent cells	Highest known value: 0.06 kPa (0.4 mm Hg) (at 20°C) (Dimethyl sulfoxide).
		pUC18 Control Plasmid DNA	Highest known value: 2.3 kPa (17.5 mm Hg) (at 20°C) (Water).
		1.42 M 2-Mercaptoethanol	Highest known value: 2.3 kPa (17.5 mm Hg) (at 20°C) (Water). Weighted average: 2.08 kPa (15.6 mm Hg) (at 20°C)
Vapor density	:	XL1-Blue MR competent cells	Highest known value: 3.1 (Air = 1) (Glycerol). Weighted average: 2.91 (Air = 1)
		pUC18 Control Plasmid DNA	Highest known value: 0.62 (Air = 1) (Water).
		1.42 M 2-Mercaptoethanol	Highest known value: 2.7 (Air = 1) (2-Mercaptoethanol). Weighted average: 0.83 (Air = 1)
Evaporation rate	:	XL1-Blue MR competent cells	0.026 (Dimethyl sulfoxide) compared with Butyl acetate.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.

10 . Stability and reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Highly reactive or incompatible with the following materials: oxidizing materials and organic materials.
Reactive or incompatible with the following materials: acids.

Hazardous decomposition products	:	XL1-Blue MR competent cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		pUC18 Control Plasmid DNA	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		1.42 M 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Conditions of reactivity - Flammability : Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Dimethyl sulfoxide	LD50 Dermal	Rat	40 gm/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Sucrose	LD50 Oral	Rat	29700 mg/kg	-
Manganese dichloride	LD50 Oral	Rat	250 mg/kg	-
Glycerol	LD50 Dermal	Rabbit	>10 gm/kg	-
	LD50 Oral	Rat	12600 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-

Eyes	:	XL1-Blue MR competent cells	No known significant effects or critical hazards.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		1.42 M 2-Mercaptoethanol	Irritating to eyes.
Skin	:	XL1-Blue MR competent cells	No known significant effects or critical hazards.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		1.42 M 2-Mercaptoethanol	Irritating to skin. May cause sensitization by skin contact.

11 . Toxicological information

Inhalation	:	XL1-Blue MR competent cells	No known significant effects or critical hazards.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		1.42 M 2-Mercaptoethanol	No known significant effects or critical hazards.
Ingestion	:	XL1-Blue MR competent cells	Toxic if swallowed.
		pUC18 Control Plasmid DNA	No known significant effects or critical hazards.
		1.42 M 2-Mercaptoethanol	Toxic if swallowed.

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
XL1-Blue MR competent cells						
Sucrose	A4	-	-	-	-	-

Potential chronic health effects

Chronic effects	:	Contains material that may cause target organ damage, based on animal data.
Carcinogenicity	:	No known significant effects or critical hazards.
Mutagenicity	:	No known significant effects or critical hazards.
Teratogenicity	:	No known significant effects or critical hazards.
Developmental effects	:	No known significant effects or critical hazards.
Fertility effects	:	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Inhalation	:	No specific data.
Ingestion	:	No specific data.
Skin	:	No specific data.
Eyes	:	No specific data.

Target organs	:	XL1-Blue MR competent cells	Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.
Other adverse effects	:	XL1-Blue MR competent cells	Not available.
		pUC18 Control Plasmid DNA	Not available.
		1.42 M 2-Mercaptoethanol	Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
Dimethyl sulfoxide	-	Acute LC50 35 to 37 ml/L Fresh water	Fish	96 hours
	-	Acute LC50 34000000 ug/L Fresh water	Fish	96 hours
Manganese dichloride	-	Acute EC50 4700 ug/L Fresh water	Daphnia	48 hours
Glycerol	-	Acute LC50 54 to 57 ml/L Fresh water	Fish	96 hours

12 . Ecological information

Potassium chloride	-	Acute EC50 83000 ug/L Fresh water	Daphnia	48 hours
	-	Acute LC50 337 mg/L Fresh water	Daphnia	48 hours
	-	Acute LC50 435000 ug/L Fresh water	Fish	96 hours

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information

DOT / IMDG / IATA : Not regulated.

15 . Regulatory information

HCS Classification :

XL1-Blue MR competent cells	Toxic material Target organ effects
pUC18 Control Plasmid DNA	Not regulated.
1.42 M 2-Mercaptoethanol	Toxic material Irritating material Sensitizing material

XL1-Blue MR competent cells	Contains material which may cause damage to the following organs: blood, kidneys, gastrointestinal tract, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
pUC18 Control Plasmid DNA	Not available.
1.42 M 2-Mercaptoethanol	Not available.

U.S. Federal regulations :

XL1-Blue MR competent cells	**United States inventory (TSCA 8b):** All components are listed or exempted.
pUC18 Control Plasmid DNA	**United States inventory (TSCA 8b):** All components are listed or exempted.
1.42 M 2-Mercaptoethanol	**United States inventory (TSCA 8b):** All components are listed or exempted.

15 . Regulatory information

XL1-Blue MR competent cells	**SARA 302/304/311/312 extremely hazardous substances**: No products were found. **SARA 302/304 emergency planning and notification**: No products were found. **SARA 302/304/311/312 hazardous chemicals**: Potassium chloride; Glycerol; Manganese dichloride; Sucrose; Dimethyl sulfoxide **SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: Potassium chloride: Immediate (acute) health hazard, Delayed (chronic) health hazard; Glycerol: Immediate (acute) health hazard, Delayed (chronic) health hazard; Manganese dichloride: Delayed (chronic) health hazard; Sucrose: Delayed (chronic) health hazard; Dimethyl sulfoxide: Immediate (acute) health hazard, Delayed (chronic) health hazard
pUC18 Control Plasmid DNA	**SARA 302/304/311/312 extremely hazardous substances**: No products were found. **SARA 302/304 emergency planning and notification**: No products were found. **SARA 302/304/311/312 hazardous chemicals**: No products were found. **SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: No products were found.
1.42 M 2-Mercaptoethanol	**SARA 302/304/311/312 extremely hazardous substances**: No products were found. **SARA 302/304 emergency planning and notification**: No products were found. **SARA 302/304/311/312 hazardous chemicals**: 2-Mercaptoethanol **SARA 311/312 MSDS distribution - chemical inventory - hazard identification**: 2-Mercaptoethanol: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard
XL1-Blue MR competent cells	**Clean Water Act (CWA) 307**: No products were found.
pUC18 Control Plasmid DNA	**Clean Water Act (CWA) 307**: No products were found.
1.42 M 2-Mercaptoethanol	**Clean Water Act (CWA) 307**: No products were found.
XL1-Blue MR competent cells	**Clean Water Act (CWA) 311**: No products were found.
pUC18 Control Plasmid DNA	**Clean Water Act (CWA) 311**: Edetic acid
1.42 M 2-Mercaptoethanol	**Clean Water Act (CWA) 311**: No products were found.
XL1-Blue MR competent cells	**Clean Air Act (CAA) 112 accidental release prevention**: No products were found.
pUC18 Control Plasmid DNA	**Clean Air Act (CAA) 112 accidental release prevention**: No products were found.
1.42 M 2-Mercaptoethanol	**Clean Air Act (CAA) 112 accidental release prevention**: No products were found.
XL1-Blue MR competent cells	**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.
pUC18 Control Plasmid DNA	**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.
1.42 M 2-Mercaptoethanol	**Clean Air Act (CAA) 112 regulated flammable substances**: No products were found.

15 . Regulatory information

XL1-Blue MR competent cells	**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.
pUC18 Control Plasmid DNA	**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.
1.42 M 2-Mercaptoethanol	**Clean Air Act (CAA) 112 regulated toxic substances**: No products were found.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	: **XL1-Blue MR competent cells**		
	Manganese dichloride	7773-01-5	5 - 10
	Hexaamminecobalt trichloride	10534-89-1	0.1 - 1
Supplier notification	: **XL1-Blue MR competent cells**		
	Manganese dichloride	7773-01-5	5 - 10
	Hexaamminecobalt trichloride	10534-89-1	0.1 - 1

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

: XL1-Blue MR competent cells

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: Glycerol;Sucrose
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed: Manganese dichloride
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: None of the components are listed.
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: Glycerol; Manganese dichloride;Sucrose
Rhode Island Hazardous Substances: None of the components are listed.

pUC18 Control Plasmid DNA

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.

15 . Regulatory information

Massachusetts Spill: None of the components are listed.
Massachusetts Substances: None of the components are listed.
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: None of the components are listed.
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: None of the components are listed.
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: None of the components are listed.
Rhode Island Hazardous Substances: None of the components are listed.

1.42 M 2-Mercaptoethanol

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: 2-Mercaptoethanol
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: None of the components are listed.
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.
New York Acutely Hazardous Substances: None of the components are listed.
New York Toxic Chemical Release Reporting: None of the components are listed.
Pennsylvania RTK Hazardous Substances: The following components are listed: 2-Mercaptoethanol
Rhode Island Hazardous Substances: None of the components are listed.

State regulations - California Prop. 65 : No products were found.

16 . Other information

Label requirements	: XL1-Blue MR competent cells	HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
	pUC18 Control Plasmid DNA	NOT EXPECTED TO PRODUCE SIGNIFICANT ADVERSE HEALTH EFFECTS WHEN THE RECOMMENDED INSTRUCTIONS FOR USE ARE FOLLOWED.
	1.42 M 2-Mercaptoethanol	HARMFUL IF SWALLOWED. CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION.

Date of issue : 01/09/2009
Version : 1

Notice to reader

DISCLAIMER: This Material Safety Data Sheet is offered without charge to the clients of Agilent Technologies. Data is the most current available to Agilent Technologies at the time of preparation and is issued as a matter of information only, no warranty as to its accuracy or completeness is expressed or implied.

☑ **Indicates information that has changed from previously issued version.**

invitrogen

Material Safety Data Sheet

Revision Date: 19-Mar-2010

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

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

Company/Undertaking Identification

INVITROGEN CORPORATON
5791 VAN ALLEN WAY
PO BOX 6482
CARLSBAD, CA 92008
760-603-7200

INVITROGEN CORPORATION
5250 MAINWAY DRIVE
BURLINGTON, ONT
CANADA L7L 6A4
800-263-6236

GIBCO PRODUCTS
INVITROGEN CORPORATION
3175 STALEY ROAD P.O. BOX 68
GRAND ISLAND, NY 14072
716-774-6700

24 hour Emergency Response (Transport): 866-536-0631
301-431-8585
Outside of the U.S. ++1-301-431-8585

For research use only

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous/Non-hazardous Components
The product contains no substances which at their given concentration, are considered to be hazardous to health. We recommend handling all chemicals with caution.

3. HAZARDS IDENTIFICATION

Emergency Overview
The product contains no substances which at their given concentration, are considered to be hazardous to health

3. HAZARDS IDENTIFICATION

Form
Liquid

Principle Routes of Exposure/ Potential Health effects

Eyes	No information available
Skin	No information available
Inhalation	No information available
Ingestion	May be harmful if swallowed.

Specific effects

Carcinogenic effects	No information available
Mutagenic effects	No information available
Reproductive toxicity	No information available
Sensitization	No information available

Target Organ Effects No information available

HMIS

Health	0
Flammability	0
Reactivity	0

4. FIRST AID MEASURES

Skin contact	Wash off immediately with plenty of water. If symptoms persist, call a physician.
Eye contact	Rinse thoroughly with plenty of water, also under the eyelids. If symptoms persist, call a physician.
Ingestion	Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Inhalation	Move to fresh air. If symptoms persist, call a physician.
Notes to physician	Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	Dry chemical
Special protective equipment for firefighters	Wear self-contained breathing apparatus and protective suit

6. ACCIDENTAL RELEASE MEASURES

Personal precautions	Use personal protective equipment
Methods for cleaning up	Soak up with inert absorbent material.

7. HANDLING AND STORAGE

Handling	No special handling advice required
Storage	Keep in properly labelled containers

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls

Exposure limits

Engineering measures	Ensure adequate ventilation, especially in confined areas

Personal protective equipment

Respiratory Protection	In case of insufficient ventilation wear suitable respiratory equipment
Hand protection	Protective gloves
Eye protection	Safety glasses with side-shields
Skin and body protection	Lightweight protective clothing.
Hygiene measures	Handle in accordance with good industrial hygiene and safety practice
Environmental exposure controls	Prevent product from entering drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

General Information

Form	Liquid

Important Health Safety and Environmental Information

Boiling point/range	**°C** No data available	**°F** No data available
Melting point/range	**°C** No data available	**°F** No data available
Flash point	**°C** No data available	**°F** No data available
Autoignition temperature	**°C** No data available	**°F** No data available
Oxidizing properties	No information available	
Water solubility	No data available	

10. STABILITY AND REACTIVITY

Stability	Stable.
Materials to avoid	No information available
Hazardous decomposition products	No information available
Polymerization	Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Principle Routes of Exposure/ Potential Health effects

Eyes	No information available
Skin	No information available
Inhalation	No information available

Ingestion	May be harmful if swallowed.

Specific effects **(Long Term Effects)**

Carcinogenic effects	No information available
Mutagenic effects	No information available
Reproductive toxicity	No information available
Sensitization	No information available

Target Organ Effects — No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity effects	No information available.
Mobility	No information available.
Biodegradation	Inherently biodegradable.
Bioaccumulation	Does not bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with local regulations

14. TRANSPORT INFORMATION

IATA

Proper shipping name	Not classified as dangerous in the meaning of transport regulations
Hazard Class	No information available
Subsidiary Class	No information available
Packing group	No information available
UN-No	No information available

15. REGULATORY INFORMATION

International Inventories

U.S. Federal Regulations

SARA 313
This product is not regulated by SARA.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product does not contains HAPs.

U.S. State Regulations

California Proposition 65
This product does not contain chemicals listed under Proposition 65

WHMIS hazard class:
Non-controlled

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR

16. OTHER INFORMATION

For research use only

The above information was acquired by diligent search and/or investigation and the recommendations are based on prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since the Company cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS MSDS DOES NOT CONSTITUTE A WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

End of Safety Data Sheet

Attachment 5A

BLS cells – Bare Lymphocyte Syndrome
- BLS cells transfected with MHC II: DQ 2A3B, DQ 3.2, HLA-DR4

Detroit 562 pharyngeal cell line CCL138
H293 (HEK293)
HT-29
Hut-78
Jurkat Wildtype e6.1
- JurkatB chain deficient transfectants:
  - JRT 2.5
  - JRT3.5 B-chain deficient
  - LCK (Jcam 1.6)
  - JRT3
  - JRT3 c(pBig2i, i3)
  - R9
  - EP8
  - C10, C10 3.2
  - pBig2i #1, 4, 6
  - vB1.7
  - vB2.1 #2, 8, 9, 10, 12, 14
  - vB5.1
  - vB6.7
  - Y56A

LG-2
SKOV-3
T24 D6
TALL 104 ATCC, H9
THP1
U937
WiDr

Attachment 5b

Cell Biology

ATCC® Number:	CCL-138™ Order this Item	Price:	**$323.00**

Designations:	Detroit 562
Depositors:	CS Stulberg
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
Source:	**Organ:** pharynx **Disease:** carcinoma **Derived from metastatic site:** pleural effusion
Cellular Products:	keratin
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.
Virus Susceptibility:	Human poliovirus 1 Vesicular stomatitis virus
DNA Profile (STR):	Amelogenin: X CSF1PO: 11,13 D13S317: 12 D16S539: 11 D5S818: 11,12 D7S820: 8,10 TH01: 8,9 TPOX: 8,10 vWA: 16
Cytogenetic Analysis:	Modal number = 64; range = 58 to128 A large subterminal marker chromosome, arm ratio 3:4, is found in 94% of the cells karyotyped. Five to 6 minute chromosomes are present in each cell.
Isoenzymes:	G6PD, B
Age:	adult
Gender:	female
Ethnicity:	Caucasian
Comments:	The cells are positive for keratin by immunoperoxidase staining.

Related Links

NCBI Entrez Search
Make a Deposit
Frequently Asked Questions
Material Transfer Agreement
Technical Support
Related Cell Culture Products

Propagation:

ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:

Protocol:

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin-0.53 mM EDTA solution to remove all traces of serum that contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes). Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37°C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.
6. Incubate cultures at 37°C.

Subcultivation Ratio: A subcultivation ratio of 1:2 to 1:4 is recommended
Medium Renewal: Every 2 to 3 days

Preservation:

Freeze medium: Complete growth medium supplemented with 5% (v/v) DMSO
Storage temperature: liquid nitrogen vapor phase

Related Products:

Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003
recommended serum:ATCC 30-2020

References:

1071: Peterson WD Jr., et al. Glucose-6-phosphate dehydrogenase isoenzymes in human cell cultures determined by sucrose-agar gel and cellulose acetate zymograms. Proc. Soc. Exp. Biol. Med. 128: 772-776, 1968. PubMed: 5668122
1072: Peterson WD Jr., et al. A permanent heteroploid human cell line with type B glucose-6-phosphate dehydrogenase. Proc. Soc. Exp. Biol. Med. 136: 1187-1191, 1971. PubMed: 5554463

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ATCC

Product Description

Material Transfer Agreement

local distributor

Print this Page

Cell Biology

ATCC® Number:	CRL-1573™ Order this Item
Designations:	293 [HEK-293]
Depositors:	FL Graham
Biosafety Level:	2 [CELLS CONTAIN ADENOVIRUS]
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial

Price: $256.00

Related Links

- NCBI Entrez Search
- Cell Micrograph
- Make a Deposit
- Frequently Asked Questions
- Material Transfer Agreement
- Technical Support
- Related Cell Culture Products

Source:	**Organ:** embryonic kidney **Cell Type:** transformed with adenovirus 5 DNA
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Restrictions:	These cells are distributed for research purposes only. 293 cells, their products, or their derivatives may not be distributed to third parties.
Applications:	efficacy testing [92587] transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents) viruscide testing [92579]
Receptors:	vitronectin, expressed
Tumorigenic:	Yes
DNA Profile (STR):	Amelogenin: X CSF1PO: 11,12 D13S317: 12,14 D16S539: 9,13 D5S818: 8,9 D7S820: 11,12 THO1: 7,9.3 TPOX: 11 vWA: 16,19
Cytogenetic Analysis:	This is a hypotriploid human cell line. The modal chromosome number was 64, occurring in 30% of cells. The rate of cells with higher ploidies was 4.2 %. The der(1)t(1;15) (q42;q13), der(19)t(3;19) (q12;q13), der(12)t(8;12) (q22;p13), and four other marker chromosomes were common to most cells. Five other markers occurred in some cells only. The marker der(1) and M8 (or Xq+) were often paired. There were four copies of N17 and N22. Noticeably in addition to three copies of X chromosomes, there were paired Xq+, and a single Xp+ in most cells.
Age:	fetus
Comments:	

Cell Biology

ATCC® Number:	**HTB-38™** Order this Item	Price:	**$272.00**

Designations:	HT-29
Depositors:	J Fogh
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial 
Source:	**Organ:** colon **Disease:** colorectal adenocarcinoma
Cellular Products:	secretory component of IgA; carcinoembryonic antigen (CEA); transforming growth factor beta binding protein; mucin
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Restrictions:	The cells are distributed for research purposes only. The Memorial Sloan-Kettering Cancer Center releases the line subject to the following: 1.) The cells or their products must not be distributed to third parties. Commercial interests are the exclusive property of Memorial Sloan-Kettering Cancer Center. 2.) Any proposed commercial use of these cells must first be negotiated with The Director, Office of Industrial Affairs, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021; phone (212) 639-6181; FAX (212) 717-3439.
Isolation:	**Isolation date:** 1964
Applications:	transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents)
Receptors:	human adrenergic alpha2A [23560] urokinase receptor (u-PAR) vitamin D (moderate expression) urokinase receptor (u-PAR); vitamin D (moderate expression)
Virus Susceptibility:	human immunodeficiency virus (HIV, LAV)
Tumorigenic:	Yes
Oncogene:	myc +; ras +; myb +; fos +; sis +; p53 +; abl -; ros -; src -

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Antigen Expression:	Blood Type A; Rh+; HLA A1, A3, B12, B17, Cw5
DNA Profile (STR):	Amelogenin: X CSF1PO: 11,12 D13S317: 11,12 D16S539: 11,12 D5S818: 11,12 D7S820: 10 THO1: 6,9 TPOX: 8,9 vWA: 17,19
Cytogenetic Analysis:	modal number = 71; range = 68 to 72. The stemline chromosome number is hypertriploid with the 2S component occurring at 2.4%. Seventeen marker chromosomes are found in most metaphases, generally in single copy per chromosome. The marker designations are: M1p-(=t(3p-;?) with a deleted short arm), t(7q;?), t(10q;?), i(13q), 19q+a; M6, ?t(8q;9q-), ?Xp, M9, 6q+, t(13;?)a, t(13;?)b, 19q+b, M14, M15, 15p+, and Xq-. Chromosome 13 is nullisomic and chromosomes 8 and 14 are generally monosomic. No Y chromosome was detected by QM band analysis.
Isoenzymes:	AK-1, 1 ES-D, 1 G6PD, B GLO-I, 1-2 Me-2, 1 PGM1, 1-2 PGM3, 1-2
Age:	44 years adult
Gender:	female
Ethnicity:	Caucasian
Comments:	Ultrastructural features reported for HT-29 cells include microvilli, microfilaments, large vacuolated mitochondria with dark granules, smooth and rough endoplasmic reticulum with free ribosomes, lipid droplets, few primary and many secondary lysosomes. The cells express urokinase receptors, but do not have detectable plasminogen activator activity [PubMed ID: 8381394]. HT-29 cells are negative for CD4, but there is cell surface expression of galactose ceramide (a possible alternative receptor for HIV). The line is positive for expression of c-myc, K-ras, H-ras, N-ras, Myb, sis and fos oncogenes. The p53 antigen is overproduced, and there is a G -> A mutation in codon 273 of the p53 gene resulting in an Arg -> His substitution. N-myc oncogene expression was not detected. There is a G -> A mutation in codon 273 of the p53 gene resulting in an Arg -> His substitution.

References:

human tumor cell lines producing tumors in nude mice. J. Natl. Cancer Inst. 59: 221-226, 1977. PubMed: 327080
22564: Adachi A, et al. Productive, persistent infection of human colorectal cell lines with human immunodeficiency virus. J. Virol. 61: 209-213, 1987. PubMed: 3640832
22570: Fantini J, et al. Human colon epithelial cells productively infected with human immunodeficiency virus show impaired differentiation and altered secretion. J. Virol. 66: 580-585, 1992. PubMed: 1727501
22807: Butzow R, et al. A 60-kD protein mediates the binding of transforming growth factor-beta to cell surface and extracellular matrix proteoglycans. J. Cell Biol. 122: 721-727, 1993. PubMed: 8335695
22861: Trainer DL, et al. Biological characterization and oncogene expression in human colorectal carcinoma cell lines. Int. J. Cancer 41: 287-296, 1988. PubMed: 3338874
22866: Hanski C, et al. Tumorigenicity, mucin production and AM-3 epitope expression in clones selected from the HT-29 colon carcinoma cell line. Int. J. Cancer 50: 924-929, 1992. PubMed: 1372882
22867: Reiter LS, et al. The role of the urokinase receptor in extracellular matrix degradation by HT29 human colon carcinoma cells. Int. J. Cancer 53: 444-450, 1993. PubMed: 8381394
22996: Barnett SW, et al. Characterization of human immunodeficiency virus type 1 strains recovered from the bowel of infected individuals. Virology 182: 802-809, 1991. PubMed: 2024498
23105: Shabahang M, et al. 1,25-Dihydroxyvitamin D3 receptor as a marker of human colon carcinoma cell line differentiation and growth inhibition. Cancer Res. 53: 3712-3718, 1993. PubMed: 8393379
23154: Lesuffleur T, et al. Differential expression of the human mucin genes MUC1 to MUC5 in relation to growth and differentiation of different mucus-secreting HT- 29 cell subpopulations. J. Cell Sci. 106: 771-778, 1993. PubMed: 8308060
23226: Pollack MS, et al. HLA-A, B, C and DR alloantigen expression on forty-six cultured human tumor cell lines. J. Natl. Cancer Inst. 66: 1003-1012, 1981. PubMed: 7017212
23335: Fantini J, et al. Infection of colonic epithelial cell lines by type 1 human immunodeficiency virus is associated with cell surface expression of galactosylceramide, a potential alternative gp120 receptor. Proc. Natl. Acad. Sci. USA 90: 2700-2704, 1993. PubMed: 8464878
23560: Devedjian JC, et al. Regulation of the alpha 2A-adrenergic receptor in the HT29 cell line. Effects of insulin and growth factors. J. Biol. Chem. 266: 14359-14366, 1991. PubMed: 1677644
25093: Santoro IM, Groden J. Alternative splicing of the APC gene and its association with terminal differentiation. Cancer

Propagation:

ATCC complete growth medium: The base medium for this cell line is ATCC-formulated McCoy's 5a Medium Modified, Catalog No. 30-2007. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:

Protocol:

1. Remove and discard culture medium.
2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin - 0.53 mM EDTA solution to remove all traces of serum which contains trypsin inhibitor.
3. Add 2.0 to 3.0 ml of Trypsin-EDTA solution to flask and observe cells under an inverted microscope until cell layer is dispersed (usually within 5 to 15 minutes). Note: To avoid clumping do not agitate the cells by hitting or shaking the flask while waiting for the cells to detach. Cells that are difficult to detach may be placed at 37C to facilitate dispersal.
4. Add 6.0 to 8.0 ml of complete growth medium and aspirate cells by gently pipetting.
5. Add appropriate aliquots of the cell suspension to new culture vessels.
6. Incubate cultures at 37C.

Subcultivation Ratio: A subcultivation ratio of 1:3 to 1:8 is recommended
Medium Renewal: 2 to 3 times per week

Preservation:

Freeze medium: Complete growth medium, 95%; DMSO, 5%
Storage temperature: liquid nitrogen vapor temperature

Related Products:

Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2007
recommended serum:ATCC 30-2020
derivative:ATCC CCL-218
purified DNA:ATCC HTB-38D

18385: Didier ES, et al. Characterization of Encephalitozoon (Septata) intestinailis isolates cultured from nasal mucosa and bronchoalveolar lavage fluids of two AIDS patients. J. Eukaryot. Microbiol. 43: 34-43, 1996. PubMed: 8563708
21869: . Human tumor cells in vitro. New York: Plenum Press; 1975.
22411: Chen TR, et al. WiDr is a derivative of another colon adenocarcinoma cell line, HT-29. Cancer Genet. Cytogenet. 27: 125-134, 1987. PubMed: 3472642
22536: Fogh J, et al. Absence of HeLa cell contamination in 169 cell lines derived from human tumors. J. Natl. Cancer Inst. 58: 209-214, 1977. PubMed: 833871
22539: Fogh J, et al. One hundred and twenty-seven cultured

Res. 57: 488-494, 1997. PubMed: 9012479
32248: Bermudez LE, et al. Exposure to low oxygen tension and increased osmolarity enhance the ability of Mycobacterium avium to enter intestinal epithelial (HT-29) cells. Infect. Immun. 65: 3768-3773, 1997. PubMed: 9284150
32265: Tsao H, et al. Novel mutations in the p16/CDKN2A binding region of the Cyclin-dependent Kinase-4 gene. Cancer Res. 58: 109-113, 1998. PubMed: 9426066
32282: Qian XC, Brent TP. Methylation hot spots in the 5' flanking region denote silencing of the O6-methylguanine-DNA methyltransferase gene. Cancer Res. 57: 3672-3677, 1997. PubMed: 9288770
32297: Morin PJ, et al. Apoptosis and APC in colorectal tumorigenesis. Proc. Natl. Acad. Sci. USA 93: 7950-7954, 1996. PubMed: 8755583
32376: White LJ, et al. Attachment and entry of recombinant norwalk virus capsids to cultured human and animal cell lines. J. Virol. 70: 6589-6597, 1996. PubMed: 8794293
32396: Kolanus W, et al. alphaLbeta2 integrin/LFA-1 binding to ICAM-1 induced by cytohesin-1 a cytoplasmic regulatory molecule. Cell 86: 233-242, 1996. PubMed: 8706128
32910: Wang R, et al. Cellular adherence elicits ligand-independent activation of the Met cell-surface receptor. Proc. Natl. Acad. Sci. USA 93: 8425-8430, 1996. PubMed: 8710887
32923: Young SW, et al. Gadolinium(III) texaphyrin: a tumor selective radiation sensitizer that is detectable by MRI. Proc. Natl. Acad. Sci. USA 93: 6610-6615, 1996. PubMed: 8692865
32929: Groh V, et al. Cell stress-regulated human major histocompatibility complex class I gene expressed in gastrointestinal epithelium. Proc. Natl. Acad. Sci. USA 93: 12445-12450, 1996. PubMed: 8901601
33045: Takahashi K, et al. Keratan sulfate modification of CD44 modulates adhesion to hyaluronate. J. Biol. Chem. 271: 9490-9496, 1996. PubMed: 8621620

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Cell Biology

ATCC® Number: TIB-161™ Order this Item

Price: $273.00

Designations: HuT 78

Depositors: AF Gazdar

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: *Homo sapiens* (human)

Morphology: lymphoblast

PHOTO

Source: **Disease:** Sezary Syndrome
Cell Type: cutaneous T lymphocyte;

Cellular Products: interleukin 2 [1140]
tumor necrosis factor alpha (TNF alpha) [23420]

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

Applications: transfection host (Nucleofection technology from Lonza)

Receptors: interleukin 2 (IL-2), expressed [1140]

Tumorigenic: Yes

Antigen Expression: CD4; Homo sapiens [22610]

DNA Profile (STR): Amelogenin: X,Y
CSF1PO: 11,12
D13S317: 8,12
D16S539: 11,12
D5S818: 11,12
D7S820: 8,11
THO1: 8,9
TPOX: 8,9
vWA: 14,15

Age: 53 years adult

Gender: male

Ethnicity: Caucasian

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Comments: H9 (ATCC HTB-176) is a clonal derivative of HuT 78 [Pubmed: 2567177].

Propagation:
ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Iscove's Modified Dulbecco's Medium, Catalog No. 30-2005. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 20%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C

Subculturing:
Protocol: Cultures can be maintained by addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension in fresh medium at 2 X 10 exp5 viable cells/ml. Maintain cultures at cell concentrations between 5 X 10 exp4 and 8 X 10 exp5 viable cells/ml. maintain cell density at less than 1 X 10 exp6 cells/ml.
Medium Renewal: Two to three times weekly

Preservation:
Freeze medium: Complete growth medium 95%; DMSO, 5%
Storage temperature: liquid nitrogen vapor phase

Doubling Time: about 65 hours

Related Products: Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2005
recommended serum:ATCC 30-2020
derivative:ATCC HTB-176

References:
1140: Gootenberg JE, et al. Human cutaneous T cell lymphoma and leukemia cell lines produce and respond to T cell growth factor. J. Exp. Med. 154: 1403-1418, 1981. PubMed: 6975346
22484: Mann DL, et al. Origin of the HIV-susceptible human CD4+ cell line H9. AIDS Res. Hum. Retroviruses 5: 253-255, 1989. PubMed: 2567177
22610: Gazdar AF, et al. Mitogen requirements for the in vitro propagation of cutaneous T-cell lymphomas. Blood 55: 409-417, 1980. PubMed: 6244013
23228: Chen TR. Karyotypic derivation of H9 cell line expressing human immunodeficiency virus susceptibility. J. Natl. Cancer Inst. 84: 1922-1926, 1992. PubMed: 1460674
23420: O'Connell MA, et al. Cellular proliferation and activation of NF kappa B are induced by autocrine production of tumor necrosis factor alpha in the human T lymphoma line HuT 78. J. Biol. Chem. 270: 7399-7404, 1995. PubMed: 7706285
32283: Hu SX, et al. Development of an adenovirus vector with tetracycline-regulatable human tumor necrosis factor alpha gene expression. Cancer Res. 57: 3339-3343, 1997. PubMed: 9269991
32396: Kolanus W, et al. alphaLbeta2 integrin/LFA-1 binding to ICAM-1 induced by cytohesin-1 a cytoplasmic regulatory molecule. Cell 86: 233-242, 1996. PubMed: 8706128
32796: Bloom TJ, Beavo JA. Identification and tissue-specific expression of PDE7 phosphodiesterase splice variants. Proc. Natl. Acad. Sci. USA 93: 14188-14192, 1996. PubMed: 8943082

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Cell Biology

ATCC® Number: TIB-152™ Order this Item

Price: $272.00

Designations: Jurkat, Clone E6-1

Depositors: A Weiss

Biosafety Level: 1

Shipped: frozen

Medium & Serum: See Propagation

Growth Properties: suspension

Organism: *Homo sapiens* (human)

Morphology: lymphoblast

Source: **Disease:** acute T cell leukemia
Cell Type: T lymphocyte;

Cellular Products: interleukin-2 (interleukin 2, IL-2) [1609]

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

Applications: transfection host (Nucleofection technology from Lonza, Roche FuGENE® Transfection Reagents)

Receptors: T cell antigen receptor, expressed

Antigen Expression: CD3; Homo sapiens, expressed

DNA Profile (STR): Amelogenin: X,Y
CSF1PO: 11,12
D13S317: 8,12
D16S539: 11
D5S818: 9
D7S820: 8,12
THO1: 6,9.3
TPOX: 8,10
vWA: 18

Cytogenetic Analysis: This is a pseudodiploid human cell line. The modal chromosome number is 46, occurring in 74% with polyploidy at 5.3%. The karyotype is 46,XY,-2,-18,del(2) (p21p23),del(18) (p11.2). Most cells had normal X and Y chromosomes.

Gender: male

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Comments:	This is a clone of the Jurkat-FHCRC cell line, a derivative of the Jurkat cell line [1609] The Jurkat cell line was established from the peripheral blood of a 14 year old boy by Schneider et al. and was originally designated JM. [50685] [112530] Clone E6-1 cells produce large amounts of IL-2 after stimulation with phorbol esters and either lectins or monoclonal antibodies against the T3 antigen (both types of stimulants are needed to induce IL-2 production. [1609] The line was cloned from cells obtained from Dr. Kendall Smith and are mycoplasma free. [1609]
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Atmosphere:** air, 95%; carbon dioxide (CO2), 5% **Temperature:** 37.0°C
Subculturing:	**Protocol:** Cultures can be maintained by the addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 1 X 10(5) viable cells/ml. Do not allow the cell density to exceed 3 X 10(6) cells/ml. **Interval:** Maintain cultures at a cell concentraion between between 1 X 10(5) and 1 X 10(6) viable cells/ml. **Medium Renewal:** Add fresh medium every 2 to 3 days (depending on cell density)
Preservation:	**Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO **Storage temperature:** liquid nitrogen vapor phase
Doubling Time:	48 hrs
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001 recommended serum:ATCC 30-2020 derivative:ATCC CRL-1990 derivative:ATCC CRL-2063 derivative:ATCC TIB-153

Cell Biology

ATCC® Number:	**HTB-77™** Order this Item	Price:	**$272.00**

Designations:	SK-OV-3 [SKOV-3]
Depositors:	G Trempe, LJ Old
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
Source:	**Organ:** ovary **Disease:** adenocarcinoma **Derived from metastatic site:** ascites
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. No additional permits and/or forms are required
Restrictions:	The cells are distributed for research purposes only. The Memorial Sloan-Kettering Cancer Center releases the line subject to the following: 1.) The cells or their products must not be distributed to third parties. Commercial interests are the exclusive property of Memorial Sloan-Kettering Cancer Center. 2.) Any proposed commercial use of these cells must first be negotiated with The Director, Office of Industrial Affairs, Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021; phone (212) 639-6181; FAX (212) 717-3439.
Isolation:	**Isolation date:** 1973
Applications:	transfection host (Roche FuGENE® Transfection Reagents Nucleofection technology from Lonza)
Tumorigenic:	Yes
Antigen Expression:	Blood Type B; Rh+
DNA Profile (STR):	Amelogenin: X CSF1PO: 11 D13S317: 8,11 D16S539: 12 D5S818: 11 D7S820: 13,14 THO1: 9,9.3 TPOX: 8,11 vWA: 17,18

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Cytogenetic Analysis:	This is a hypodiploid human cell line. The modal chromosome number was 43, occurring in 63.3% of cells. The range was 42 to 45. The rate of higher ploidies was 32%. The del(1)(q21), der(13)t(1;?;13) (q11;?;q34), der(11)t(11;?) (q12), del(10)(q22) and 3 other marker chromosomes were common to most cells, and 3 others were found only in some cells. One N11 had the HSR segment from p11 to the distal end. The normal N10, N12, N15, N17 and N19 were absent. Others were either single or paired. There were from 1 to 6 rearranged and unassignable chromosomes. The X chromosome was either single or paired.
Isoenzymes:	AK-1, 1 ES-D, 1 G6PD, B GLO-I, 1-2 Me-2, 1 PGM1, 1-2 PGM3, 1
Age:	64 years
Gender:	female
Ethnicity:	Caucasian
Comments:	SK-OV-3 cells are resistant to tumor necrosis factor and to several cytotoxic drugs including diphtheria toxin, cis-platinum and adriamycin.
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated McCoy's 5a Medium Modified, Catalog No. 30-2007. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Atmosphere:** air, 95%; carbon dioxide (CO2), 5% **Temperature:** 37.0°C

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Cell Biology

ATCC® Number: HTB-4™ Order this item

Price: $273.00

Designations:	T24
Depositors:	C O'Toole
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
Source:	**Organ:** urinary bladder **Disease:** transitional cell carcinoma
Cellular Products:	tumor specific antigen
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Applications:	transfection host (Roche FuGENE® Transfection Reagents technology from amaxa)
Tumorigenic:	Yes
Antigen Expression:	HLA A1, A3, B18, Bw35, Cw4, DRw2, Dw4
DNA Profile (STR):	Amelogenin: X CSF1PO: 10,12 D13S317: 12 D16S539: 9 D5S818: 10,12 D7S820: 10,11 THO1: 6 TPOX: 8,11 vWA: 17
Cytogenetic Analysis:	hypodiploidy to hypopentaploidy, stemline 86: 2 to 4 telocentrics; 3 to 4 minutes, hypotetraploid to hypertetraploid with abnormalities including dicentrics, breaks, pulverization, minutes and teloccentric markers
Isoenzymes:	AK-1, 1 ES-D, 1 G6PD, B GLO-I, 1 Me-2, 1-2 PGM1, 1 PGM3, 1
Age:	81 years
Gender:	female
Ethnicity:	Caucasian

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Comments: Leukocytes and sera from patients with transitional cell carcinoma were cytotoxic to T24 and related lines.
Cells have a 19 hour generation time.
Contains the ras (H-ras) oncogene

Propagation: **ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated McCoy's 5a Medium Modified, Catalog No. 30-2007. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%.
Temperature: 37.0°C

Subculturing: **Subcultivation Ratio:** A subcultivation ratio of 1:3 to 1:8 is recommended
Medium Renewal: 2 to 3 times per week
Remove medium, and rinse with 0.25% trypsin, 0.03% EDTA solution. Remove the solution and add an additional 1 to 2 ml of trypsin-EDTA solution. Allow the flask to sit at room temperature (or at 37C) until the cells detach.
Add fresh culture medium, aspirate and dispense into new culture flasks.

Preservation: Culture medium, 95%; DMSO, 5%

Related Products: recommended serum:ATCC 30-2020

References:

21849: O'Toole CHuman bladder cancer lines: HLA Class I and Class II antigen expression and susceptibility to cytostatic and cytotoxic effects in vitro*In:* O'Toole CIn vitro models for cancer researchvol. IVBoca Raton, FLCRC Presspp. 103-125.
22365: O'Toole C, et al. Cellular immunity to human urinary bladder carcinoma. I. Correlation to clinical stage and radiotherapy. Int. J. Cancer 10: 77-91, 1972. PubMed: 4196436
22443: Williams BY, Schonbrunn A. Bombesin receptors in a human duodenal tumor cell line: binding properties and function. Cancer Res. 54: 818-824, 1994. PubMed: 8306345
22510: Bubenik J, et al. Cellular and humoral immune responses to human urinary bladder carcinomas. Int. J. Cancer 5: 310-319, 1970. PubMed: 5452065
22536: Fogh J, et al. Absence of HeLa cell contamination in 169 cell lines derived from human tumors. J. Natl. Cancer Inst. 58: 209-214, 1977. PubMed: 833871
22539: Fogh J, et al. One hundred and twenty-seven cultured human tumor cell lines producing tumors in nude mice. J. Natl. Cancer Inst. 59: 221-226, 1977. PubMed: 327080
22849: Bubenik J, et al. Established cell line of urinary bladder carcinoma (T24) containing tumour-specific antigen. Int. J. Cancer 11: 765-773, 1973. PubMed: 4133950
23226: Pollack MS, et al. HLA-A, B, C and DR alloantigen expression on forty-six cultured human tumor cell lines. J. Natl. Cancer Inst. 66: 1003-1012, 1981. PubMed: 7017212
23256: Carey TE, et al. Cell surface antigens of human malignant melanoma: mixed hemadsorption assays for humoral immunity to cultured autologous melanoma cells. Proc. Natl. Acad. Sci. USA 73: 3278-3282, 1976. PubMed: 1067619
24381: Fogh J. Cultivation, characterization, and identification of human tumor cells with emphasis on kidney, testis, and bladder tumors. Natl. Cancer Inst. Monogr. 49: 5-9, 1978. PubMed: 571047
25065: Bellet D, et al. Malignant transformation of nontrophoblastic cells is associated with the expression of chorionic gonadotropin beta genes normally transcribed in trophoblastic cells. Cancer Res. 57: 516-523, 1997. PubMed: 9012484
26316: Bubenik J, et al. Cellular immunity to renal carcinomas in man. Int. J. Cancer 8: 503-513, 1971. PubMed: 5137312
32266: Bender CM, et al. Inhibition of DNA methylation by 5-Aza-2'-deoxycytidine suppresses the growth of human tumor cell lines. Cancer Res 58: 95-101, 1998. PubMed: 9426064
33025: Ponton A, et al. The CD95 (APO-1/Fas) receptor activates NF-kappaB independently of its cytotoxic function. J. Biol. Chem. 271: 8991-8995, 1996. PubMed: 8621545

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Cell Biology

ATCC® Number:	CRL-11386™ Order this Item	Price:	$458.00

Designations:	TALL-104
Depositors:	Wistar Institute
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	suspension
Organism:	*Homo sapiens* (human)
Morphology:	lymphoblast
Source:	**Disease:** acute lymphoblastic leukemia **Cell Type:** T lymphoblast;
Cellular Products:	interferon gamma (IFN gamma); tumor necrosis factor alpha (TNF alpha); granulocyte monocyte colony stimulating factor (GM-CSF)
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.
Receptors:	T cell antigen receptor alpha/beta (TCR), expressed interleukin 2 (IL-2), expressed interleukin 2 (IL-2); T cell antigen receptor alpha/beta (TCR)
Antigen Expression:	CD2 +; CD3 +; CD7 +; CD8 +; CD56 +; CD4 -; CD16 -
DNA Profile (STR):	Amelogenin: X,Y CSF1PO: 10,11 D13S317: 9,12 D16S539: 12 D5S818: 12,13 D7S820: 7,13 THO1: 7,9 TPOX: 8,9 vWA: 14,18
Cytogenetic Analysis:	46, XY; t(11;14)(p13;q11)
Age:	2 years
Gender:	male

Related Links

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The TALL-104 line was established from the peripheral blood of a child in relapse with T-ALL.
The cells are highly cytotoxic and are capable of tumor destruction in vivo and in vitro.

Comments:

IL-2 is required from optimal growth and long term cultivation, but the cells can be grown for short periods without IL-2 (growth will be slower).
The cells are positive for the alpha/beta TCR and negative for gamma/delta TCR.

Propagation:

ATCC complete growth medium: The base medium for this cell line is ATCC-formulated Iscove's Modified Dulbecco's Medium, Catalog No. ATCC 30-2005. To make the complete growth medium, add the following components to the base medium: 50 to 100 units/ml recombinant human IL-2; 2.5 microgram/ml human albumin; 0.5 microgram/ml D-mannitol; fetal bovine serum to a final concentration of 20%.
Atmosphere: air, 95%; carbon dioxide (CO2), 5%
Temperature: 37.0°C
Growth Conditions: Successful growth of this cell line is very dependent upon the quality of IL-2 used in the growth medium. ATCC recommends using the highest quality IL-2 available.

Subculturing:

Protocol: Cultures can be maintained by addition or replacement of fresh medium. Start cultures at least 8 X 10(5) cells/ml.
Note: IL-2 rapidly loses its potency in medium, it is important that fresh IL-2 be used.
Interval: Maintain between 4 X 10(5) and 1 X 10(6) cells/ml.
Medium Renewal: Add medium as cell density increases

Preservation:

Freeze medium: Complete growth medium supplemented with 50% fetal bovine serum, and 10% DMSO. Freeze at a cell density of at least 15 X 10(6) cells/ml
Storage temperature: liquid nitrogen vapor phase

References:

22047: Santoli D, et al. Cytotoxic T-ALL cell lines and uses therefor. US Patent 5,272,082 dated Dec 21 1993
23356: O'Connor R, et al. Growth factor requirements of childhood acute T-lymphoblastic leukemia: correlation between presence of chromosomal abnormalities and ability to grow permanently in vitro. Blood 77: 1534-1545, 1991. PubMed: 1706955
23357: Cesano A, et al. Homing and progression patterns of childhood acute lymphoblastic leukemias in severe combined immunodeficiency mice. Blood 77: 2463-2474, 1991. PubMed: 2039829

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Cell Biology

ATCC® Number:	**HTB-176™** Order this Item	Price:	**$268.00**

Designations:	H9 [derivative of HuT 78]
Depositors:	RC Gallo, M Popovic
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	suspension
Organism:	*Homo sapiens* (human)
Morphology:	lymphoblast 
Source:	**Disease:** lymphoma **Cell Type:** cutaneous T lymphocyte;
Cellular Products:	interleukin-2 (interleukin 2, IL-2)
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Applications:	transfection host (Roche FuGENE® Transfection Reagents)
Receptors:	interleukin 2 (IL-2)
Virus Susceptibility:	human immunodeficiency virus 1 (HIV-1, also known as HTLV-III or LAV)
Tumorigenic:	Yes
Antigen Expression:	CD4; HLA A1, B62, C3, DR4, DQ3
DNA Profile (STR):	Amelogenin: X,Y CSF1PO: 11 D13S317: 8,12 D16S539: 11,12 D5S818: 11 D7S820: 8,11 THO1: 8,9 TPOX: 8,9 vWA: 14,15

Related Links

- NCBI Entrez Search
- Cell Micrograph
- Make a Deposit
- Frequently Asked Questions
- Material Transfer Agreement
- Technical Support
- Related Cell Culture Products

Cytogenetic Analysis:	This is a near triploid cell line (modal number = 69; range = 58 to 74). The frequency of higher ploidies is 2.5%. The line has an extremely complex karyotype with nearly 60% of the chromosomes in each cell being structurally altered marker chromosomes., Among the markers are t(3p4q), t(5q6q), t(5p6p), i(18q), i(18p); t(4q7p), and del(7)(q32). The first four of these are usually paired. Normal N4, N5, N6, N7, N10, N13, N18, N19, N20 an X are absent.
Isoenzymes:	AK-1, 0 ES-D, 1 G6PD, B GLO-I, 1 Me-2, 0 PGM1, 1 PGM3, 0
Age:	53 years
Gender:	male
Ethnicity:	Caucasian
Comments:	The H9 cell line is a clonal derivative of the Hut 78 cell line (see ATCC TIB-161). The H9 clone was selected for permissiveness for HIV-1 replication, and has been used to isolate and propagate HIV-1 from the blood of patients with acquired immunodeficiency syndrome (AIDS) and pre-AIDS conditions.
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Temperature:** 37.0°C
Subculturing:	**Medium Renewal:** Every 2 to 4 days Cultures can be maintained by addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension in fresh medium at 5 x 10 exp5 viable cells/ml. Maintain cultures at cell concentrations between 5 X 10 exp5 and 2 X 10 exp6 viable cells/ml. Do not allow cell concentration to exceed 3 X 10 exp6 cells/ml.
Preservation:	Culture medium, 95%; DMSO, 5%
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001 recommended serum:ATCC 30-2020 parental cell line:ATCC TIB-161

Cell Biology

ATCC® Number:	**TIB-202™** Order this Item	Price:	**$272.00**

Designations:	THP-1
Depositors:	S Tsuchiya
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	suspension
Organism:	*Homo sapiens* (human)
Morphology:	monocyte 
Source:	**Organ:** peripheral blood **Disease:** acute monocytic leukemia **Cell Type:** monocyte;
Cellular Products:	lysozyme [58053]
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Applications:	transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents)
Receptors:	complement (C3), expressed [58053] Fc, expressed
Antigen Expression:	HLA A2, A9, B5, DRw1, DRw2 [58053]
DNA Profile (STR):	Amelogenin: X,Y CSF1PO: 11,13 D13S317: 13 D16S539: 11,12 D5S818: 11,12 D7S820: 10 THO1: 8,9.3 TPOX: 8,11 vWA: 16
Age:	1 year infant
Gender:	male
Comments:	The cells are phagocytic (for both latex beads and sensitized erythrocytes) and lack surface and cytoplasmic immunoglobulin. [58053] Monocytic differentiation can be induced with the phorbol ester 12-O-tetradecanoylphorbol-13-acetate (TPA). [22193]

Related Links

NCBI Entrez Search

Cell Micrograph

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Frequently Asked Questions

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Technical Support

Related Cell Culture Products

Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium: 2-mercaptoethanol to a final concentration of 0.05 mM; fetal bovine serum to a final concentration of 10%. **Atmosphere:** air, 95%; carbon dioxide (CO2), 5% **Temperature:** 37.0°C
Subculturing:	**Protocol:** Cultures can be maintained by the addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 2-4 X 10(5) viable cells/ml. Subcultutre when cell concentration reaches 8X105) cells/ml.Do not allow the cell concentration to exceed 1 X 10(6) cells/ml. **Medium Renewal:** Every 2 to 3 days
Preservation:	**Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO **Storage temperature:** liquid nitrogen vapor phase
Doubling Time:	approximately 26 hrs
Related Products:	purified RNA:ATCC TIB-202R purified DNA:ATCC TIB-202D

Cell Biology

ATCC® Number:	**CRL-1593.2™**	Order this Item	Price:	**$272.00**

Designations:	U-937
Depositors:	H Koren
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	suspension
Organism:	*Homo sapiens* (human)
Morphology:	monocyte
Source:	**Disease:** histiocytic lymphoma
Cellular Products:	lysozyme; beta-2-microglobulin (beta 2 microglobulin); tumor necrosis factor (TNF), also known as tumor necrosis factor alpha (TNF-alpha, TNF alpha), after stimulation with phorbol myristic acid (PMA)
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Restrictions:	The original U-937 cell line was established by Dr. K. Nilsson's laboratory in 1974 and he has requested the following: (1) In all papers reporting any use of this cell line or any derivatives thereof a direct reference should be made to Sundstrom and Nilsson (Int. J. Cancer 17: 565-577, 1976). (2) Any proposed commercial use of the cells should be negotiated with Professor Kenneth Nilsson, Rudbeck Laboratory, SE-751 85 Uppsala, Sweden. (3) No distribution of any of the cells or sublines derived therefrom should be made to third parties; (4) The cells should be used for non-clinical, non-commercial research only.
Isolation:	**Isolation date:** 1974
Applications:	transfection host (Nucleofection technology from Lonza Roche FuGENE® Transfection Reagents)
Receptors:	complement (C3)
DNA Profile (STR):	Amelogenin: X CSF1PO: 12 D13S317: 10,12 D16S539: 12 D5S818: 12 D7S820: 9,11 THO1: 6, 9.3 TPOX: 8,11 vWA: 14, 15
Age:	37 years
Gender:	male

Related Links

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Ethnicity:	Caucasian
Comments:	The U-937 cell line was derived by Sundstrom and Nilsson in 1974 from malignant cells obtained from the pleural effusion of a patient with histiocytic lymphoma. Studies since 1979 have shown that U-937 cells can be induced to terminal monocytic differentiation by supernatants from human mixed lymphocyte cultures, phorbol esters, vitamin D3, gamma interferon, tumor necrosis factor (TNF) and, retinoic acid. The cells are negative for immunoglobulin production and Epstein-Barr virus expression. The cells express the Fas antigen, and are sensitive to TNF and anti-Fas antibodies. In 1994, PCR and cytogenetic analyses showed that a number of stocks of U-937 were contaminated with the human myeloid leukemia cell line, K-562. In the earliest stocks available, the level of contamination was 0.6%. [40484] Distribution was discontinued in March 1994, except if required for patent purposes. Anyone who wishes to receive a sample of this original material should contact the Head of the ATCC Patent Depository. A stock of CRL-1593 found to be free of K-562 was propagated continuously for 8 weeks and tested weekly by PCR. Distribution and seed stocks give DNA profiles characteristic of U-937 only. Such preparations are now offered as authentic U-937 (ATCC CRL-1593.2) and are believed to be free of second subpopulations.
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated RPMI-1640 Medium, Catalog No. 30-2001. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Atmosphere:** air, 95%; carbon dioxide (CO2), 5% **Temperature:** 37.0°C
Subculturing:	**Protocol:** Cultures can be maintained by the addition of fresh medium or replacement of medium. Alternatively, cultures can be established by centrifugation with subsequent resuspension at 1 to 2 X 10(5) viable cells/ml. **Interval:** Maintain cell density between 1 X 10(5) and 2 X 10(6) viable cells/ml. **Medium Renewal:** Add fresh medium every 3 to 4 days (depending on cell density)
Preservation:	**Freeze medium:** Complete growth medium supplemented with 5% (v/v) DMSO **Storage temperature:** liquid nitrogen vapor phase
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2001 recommended serum:ATCC 30-2020

References:

1080: Ralph P, et al. Lysozyme synthesis by established human and murine histiocytic lymphoma cell lines. J. Exp. Med. 143: 1528-1533, 1976. PubMed: 1083890
21866: . Gene expression during normal and malignant differentiation. London: Academic Press; 1985.
21876: . International symposium on new trends in human immunology and cancer immunotherapy. Paris: Doin Editeurs; 1980.
22906: Koren HS, et al. In vitro activation of a human macrophage-like cell line. Nature 279: 328-331, 1979. PubMed: 450085
22912: Gidlund M, et al. Natural killer cells kill tumour cells at a given stage of differentiation. Nature 292: 848-850, 1981. PubMed: 7266653
23049: Olsson I, et al. Induction of differentiation of the human histiocytic lymphoma cell line U-937 by 1 alpha,25-dihydroxycholecalciferol. Cancer Res. 43: 5862-5867, 1983. PubMed: 6315218
23103: Morimoto H, et al. Overcoming tumor necrosis factor and drug resistance of human tumor cell lines by combination treatment with anti-Fas antibody and drugs or toxins. Cancer Res. 53: 2591-2596, 1993. PubMed: 7684321
29094: Giovannangeli C, et al. Accessibility of nuclear DNA to triplex-forming oligonucleotides: The integrated HIV-1 provirus as a target. Proc. Natl. Acad. Sci. USA 94: 79-84, 1997. PubMed: 8990164
29139: Brigino E, et al. Interleukin 10 is induced by recombinant HIV-1 Nef protein involving the calcium/calmodulin-dependent phosphodiesterase signal transduction pathway. Proc. Natl. Acad. Sci. USA 94: 3178-3182, 1997. PubMed: 9096366
40484: Reid YA, et al. Cell Line Cross-contamination of U-937. J. Leukocyte Biol. 57: 804, 1995. PubMed: 7759961
58042: Sundstrom C, Nilsson K. Establishment and characterization of a human histiocytic lymphoma cell line (U-937). Int. J. Cancer 17: 565-577, 1976. PubMed: 178611

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Cell Biology

ATCC® Number:	CCL-218™ Order this Item	Price:	$318.00

Designations:	WiDr
Depositors:	P Noguchi
Biosafety Level:	1
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Homo sapiens* (human)
Morphology:	epithelial
Source:	**Organ:** colon **Disease:** colorectal adenocarcinoma
Cellular Products:	carcinoembryonic antigen (CEA) 118 ng/10 exp6 cells/10 days; Colon Specific Antigen (CSAp); transforming growth factor beta; keratin
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Applications:	transfection host (Roche FuGENE® Transfection Reagents)
Receptors:	epidermal growth factor (EGF)
Tumorigenic:	Yes
Antigen Expression:	HLA A24, A32, B15, B18
DNA Profile (STR):	Amelogenin: X CSF1PO: 11,12 D13S317: 11,12 D16S539: 11,12 D5S818: 11,12 D7S820: 10 THO1: 6,9 TPOX: 8,9 vWA: 17,19
Isoenzymes:	ES-D, 1 G6PD, B PEP-D, 1 PGD, A PGM1, 1-2 PGM3, 1-2
Gender:	female

Related Links

- NCBI Entrez Search
- Make a Deposit
- Frequently Asked Questions
- Material Transfer Agreement
- Technical Support
- Related Cell Culture Products

Comments:	Although deposited with the ATCC as a colon adenocarcinoma line established from a 78 year old female, DNA fingerprinting has shown this line to be a derivative of HT-29 (ATCC HTB-38). The cells are negative for Colon Antigen 3 expression. The cells are positive for keratin by immunoperoxidase staining. The cells expressed p53 antigen (the p53 produced has a G -> A mutation resulting in Arg -> His at position 273). Growth of WiDr cells is inhibited by tumor necrosis factor alpha (TNF alpha). Inhibitors of dihydrofolate reductase are highly cytotoxic to WiDr cells.
Propagation:	**ATCC complete growth medium:** The base medium for this cell line is ATCC-formulated Eagle's Minimum Essential Medium, Catalog No. 30-2003. To make the complete growth medium, add the following components to the base medium: fetal bovine serum to a final concentration of 10%. **Temperature:** 37.0°C **Subcultivation Ratio:** A subcultivation ratio of 1:6 to 1:12 is recommended **Medium Renewal:** Twice per week
Subculturing:	Remove medium, and rinse with 0.25% trypsin, 0.03% EDTA solution. Remove the solution and add an additional 1 to 2 ml of trypsin-EDTA solution. Allow the flask to sit at room temperature (or at 37C) until the cells detach. Add fresh culture medium, aspirate and dispense into new culture flasks.
Preservation:	culture medium 95%; DMSO, 5%
Related Products:	Recommended medium (without the additional supplements or serum described under ATCC Medium):ATCC 30-2003 recommended serum:ATCC 30-2020 derivative:ATCC HTB-38

Attachment 6

SIGMA-ALDRICH

MATERIAL SAFETY DATA SHEET

Date Printed: 06/02/2010
Date Updated: 07/21/2009
Version 1.8

Section 1 - Product and Company Information

Product Name	STAPHYLOCOCCAL ENTEROTOXIN B FROM STAPHYLOCOCCUS AUREUS
Product Number	S4881
Brand	SIGMA
Company	Sigma-Aldrich Canada, Ltd
Address	2149 Winston Park Drive Oakville ON L6H 6J8 CA
Technical Phone:	9058299500
Fax:	9058299292
Emergency Phone:	800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
ENTEROTOXIN B	11100-45-1	No

Synonyms: Enterotoxin B, staphylococcal * Staphylococcal enterotoxin B

RTECS Number: XW5807700

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Harmful.
Biomedical material. May cause human disease. Target organ(s): Small intestine.

HMIS RATING

HEALTH: 4*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 4
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

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

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Spilled material should be carefully wiped up or moistened with water and removed. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Avoid inhalation. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure. Do not use if skin is cut or scratched. Wash thoroughly after handling.

STORAGE
Suitable: Keep tightly closed.
Store at 2-8°C

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse.

Section 9 - Physical/Chemical Properties

Appearance: Physical State: Solid

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Nature of decomposition products not known.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

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

SENSITIZATION
Sensitization: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

TARGET ORGAN(S) OR SYSTEM(S)
Small intestine.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CONDITIONS AGGRAVATED BY EXPOSURE
Causes emesis and diarrhea in experimental animals. Associated with food poisoning and causes enteritis in humans. The dose of purified protein required to produce emesis or diarrhea in monkeys is 0.9ug/kg by oral feeding (Biochem. Vol 4, 1965).

TOXICITY DATA

Intravenous
Monkey
25 UG/KG
LDLO

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Toxins, extracted from living sources, solid, n.o.s.
UN#: 3462
Class: 6.1
Packing Group: Packing Group III
Hazard Label: Toxic substances.
PIH: Not PIH

IATA
Proper Shipping Name: Toxins, extracted from living sources, solid, n.o.s.
IATA UN Number: 3462
Hazard Class: 6.1
Packing Group: III

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: Xn
Indication of Danger: Harmful.
R: 20/22
Risk Statements: Harmful by inhalation and if swallowed.
S: 22-24/25-36/37
Safety Statements: Do not breathe dust. Avoid contact with skin and eyes. Wear suitable protective clothing and gloves.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Harmful.
US Statements: Biomedical material. May cause human disease.
Target organ(s): Small intestine.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: No
NDSL: No

Section 16 - Other Information

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

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

MATERIAL SAFETY DATA SHEET

Date Printed: 06/02/2010
Date Updated: 02/03/2006
Version 1.3

Section 1 - Product and Company Information

Product Name	TOXIC SHOCK SYNDROME TOXIN-1 (STAPHYLOCOCCAL ENTEROTOXIN F)
Product Number	T5662
Brand	SIGMA
Company	Sigma-Aldrich Canada, Ltd
Address	2149 Winston Park Drive Oakville ON L6H 6J8 CA
Technical Phone:	9058299500
Fax:	9058299292
Emergency Phone:	800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
TOXIC SHOCK SYNDROME TOXIN-1(STAPHYLOCOCCAL ENTEROTOXIN F)	None	No

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Biohazard. Highly Toxic (USA) Very Toxic (EU).
Very toxic by inhalation, in contact with skin and if swallowed.
Biomedical material. May cause human disease. Target organ(s):
Central nervous system. Cardiovascular system. This product is
regulated by US HHS regulation, 42CFR Part 73.

HMIS RATING

HEALTH: 4*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 4
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

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

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is
conscious. Call a physician immediately.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give
artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

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

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE
Suitable: Keep tightly closed.
Store at -20°C

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS
Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved

under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash contaminated clothing before reuse. Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

Appearance: Physical State: Solid

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, and nitrogen oxides, Sulfur oxides.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

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

TARGET ORGAN(S) OR SYSTEM(S)
Cardiovascular system. Central nervous system.

SIGNS AND SYMPTOMS OF EXPOSURE
Weakness. Heart palpitations. Irregular breathing. Shock. Headache. Causes a fall in blood pressure. Fever. Vomiting. Gastrointestinal disturbances. Exposure may cause: Fatigue. Confusion. Skin rash. Muscle pain and diarrhea.

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: Toxins, extracted from living sources, solid, n.o.s.
UN#: 3462
Class: 6.1
Packing Group: Packing Group I
Hazard Label: Toxic substances.
PIH: Not PIH

IATA
Proper Shipping Name: Toxins, extracted from living sources, solid, n.o.s.
IATA UN Number: 3462
Hazard Class: 6.1
Packing Group: I

Section 15 - Regulatory Information

EU ADDITIONAL CLASSIFICATION
Symbol of Danger: B-T+
Indication of Danger: Biohazard. Very toxic.
R: 26/27/28
Risk Statements: Very toxic by inhalation, in contact with skin and if swallowed.
S: 36/37/39-45
Safety Statements: Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Biohazard. Highly Toxic (USA) Very Toxic (EU).

Risk Statements: Very toxic by inhalation, in contact with skin and if swallowed.

Safety Statements: Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Statements: Biomedical material. May cause human disease.

Target organ(s): Central nervous system. Cardiovascular system.

This product is regulated by US HHS regulation, 42CFR Part 73.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: No

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: No

NDSL: No

Section 16 - Other Information

DISCLAIMER

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

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Material Safety Data Sheet

Version 4.0
Revision Date 02/27/2010
Print Date 06/02/2010

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	Staphylococcal enterotoxin A, from *Staphylococcus aureus*
Product Number	:	S9399
Brand	:	Sigma
Company	:	Sigma-Aldrich Canada, Ltd 2149 Winston Park Drive OAKVILLE ON L6H 6J8 CANADA
Telephone	:	+19058299500
Fax	:	+19058299292
Emergency Phone #	:	800-424-9300

2. HAZARDS IDENTIFICATION

Emergency Overview

Target Organs

Small intestine.

WHMIS Classification

D1A	Very Toxic Material Causing Immediate and Serious Toxic Effects	Highly Toxic

GHS Label elements, including precautionary statements

Pictogram

Signal word: Warning

Hazard statement(s)

H302 + H332	Harmful if swallowed or if inhaled.

Precautionary statement(s)

P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P330	Rinse mouth.
P501	Dispose of contents/container to an approved waste disposal plant.

HMIS Classification

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical hazards:	0

Potential Health Effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Ingestion May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS-No.	EC-No.	Index-No.	Concentration
Staphylococcal enterotoxin A from Staphylococcus aureus			
-	-	-	-

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

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

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

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

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation.

Environmental precautions
Do not let product enter drains.

Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature: 2 - 8 °C

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a dust mask type N95 (US) or type P1 (EN 143) respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
For prolonged or repeated contact use protective gloves.

Eye protection
Safety glasses with side-shields conforming to EN166

Skin and body protection
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	solid

Safety data

pH	no data available
Melting point	no data available
Boiling point	no data available
Flash point	no data available
Ignition temperature	no data available
Lower explosion limit	no data available
Upper explosion limit	no data available
Water solubility	no data available

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Conditions to avoid
no data available

Materials to avoid
Strong oxidizing agents

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Nature of decomposition products not known.

11. TOXICOLOGICAL INFORMATION

Acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitization
Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

Germ cell mutagenicity
no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity
no data available

Specific target organ toxicity - single exposure (GHS)
no data available

Specific target organ toxicity - repeated exposure (GHS)
no data available

Aspiration hazard
no data available

Potential health effects

Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. May cause skin irritation.
Eyes	May cause eye irritation.

Signs and Symptoms of Exposure
Diarrhoea, Gastrointestinal disturbance

Additional Information
RTECS: KA8082500

12. ECOLOGICAL INFORMATION

Toxicity

no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

Product
Observe all federal, state, and local environmental regulations.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN-Number: 3462 Class: 6.1 Packing group: I
Proper shipping name: Toxins, extracted from living sources, solid, n.o.s. (Staphylococcal enterotoxin A from Staphylococcus aureus)
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN-Number: 3462 Class: 6.1 Packing group: I EMS-No: F-A, S-A
Proper shipping name: TOXINS, EXTRACTED FROM LIVING SOURCES, SOLID, N.O.S. (Staphylococcal enterotoxin A from Staphylococcus aureus)
Marine pollutant: No

IATA
UN-Number: 3462 Class: 6.1 Packing group: I
Proper shipping name: Toxins, extracted from living sources, solid, n.o.s. (Staphylococcal enterotoxin A from Staphylococcus aureus)

15. REGULATORY INFORMATION

DSL Status
This product contains the following components that are not on the Canadian DSL nor NDSL lists.

	CAS-No.
Staphylococcal enterotoxin A from Staphylococcus aureus	-

WHMIS Classification

D1A	Very Toxic Material Causing Immediate and Serious Toxic Effects	Highly Toxic

16. OTHER INFORMATION

Further information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

Attachment 7

Laboratory safety policies for members of the McCormick laboratory located on level H0 in the Lawson Health Research Institute at St. Joseph's Health Care London.

"The laboratory" is considered to include H004 (main lab), H005 (DNA room), H007 (Biosafety room), H011 (equipment room), H014 (equipment and media room), H015 (walk-in refrigerator) and H019 (microscopy room).

1. Eating, drinking, chewing gum and/or smoking is prohibited in the laboratory.
2. Storage of food or applying cosmetics is prohibited in the laboratory.
3. I have read and understood the laboratory safety manual located in H004 outside of Dr. McCormick's office.
4. I have read and understood the Biosafety manual located in H004 outside of Dr. McCormick's office.
5. I have read and understood the yellow St. Joseph's Health Care emergency manual located in the hall outside H004.
6. I will follow operational protocols for experiments working with BSL Class II agents.
7. Lab coats must be worn when working in the laboratory.
8. Gloves are to be worn when directly contacting infectious materials.
9. Gloves will be disposed of in the infectious material waste and will not be disposed of in the regular garbage.
10. Hands are to be washed after working with infectious material.
11. Hands are to be washed before exiting the laboratory.
12. Paper work inside the laboratory is to be done at your desk and not on the work benches.
13. Procedures that generate aerosols with BSL Class II agents will be done in the Biological Safety Cabinet located in H007.
14. No open toed or open heeled footwear is permitted.
15. Long hair must be tied back to prevent contact with hands, specimens and equipment.
16. Contaminated work surfaces must be decontaminated at the end of the day using 70% ethanol or 10% bleach.
17. When autoclaving BSL Class II agents for disposal, the efficacy of the autoclave must be monitored using autoclave strips and records must be kept.
18. All class II bio-hazardous material must be decontaminated by autoclaving for 20 min at 121°C. This includes liquid cultures and plates and other disposal contaminated materials. All class II bio-hazardous materials must be decontaminated prior to disposal.
19. In the event of a class II biohazard spill, cultures should be covered at least ten minutes with a cloth or paper towels soaked in 10% bleach. The contaminated material should be cleared away and the area swabbed with 10% bleach or 70% ethanol. The material, swab, and other cleaning equipment should be placed in a biological wastes container for autoclaving. All necessary personnel protective equipment should be used.

I have taken the following safety training courses through the University of Western Ontario:

Course	Date Taken	Initial
Workplace Hazardous Materials Information System – WHMIS	_____	_____
Biosafety Training	_____	_____
Laboratory and Environmental/Waste Management Safety Workshop	_____	_____
Occupational Health and Safety for Supervisors	_____	_____
Radiation training	_____	_____

My signature below indicates that I have been instructed in these laboratory safety policies for the McCormick laboratory at the Lawson Health Research Institute and that I understand and agree to abide by these policies.

Name (print)	_____	Supervisor (print)	_____
Signature	_____	Signature	_____
Date	_____	Date	_____