Western University

BIOLOGICAL AGENTS REGISTRY FORM

Approved Biohazards Subcommittee: April 13, 2012

Biosafety Website: www.uwo.ca/humanresources/biosafety/

This form must be completed by each Principal Investigator holding a grant administered by the University of Western Ontario (UWO) or in charge of a laboratory/facility where the use of Level 1, 2 or 3 biological agents is described in the laboratory or animal work proposed. The form must also be completed if any work is proposed involving animals carrying zoonotic agents infectious to humans or involving plants, fungi, or insects that require Public Health Agency of Canada (PHAC) or Canadian Food Inspection Agency (CFIA) permits.

This form must be updated at least every 3 years or when there are changes to the biological agents being used.

Containment Levels will be established in accordance with Laboratory Biosafety Guidelines, 3rd edition, 2004, Public Health Agency of Canada (PHAC) or Containment Standards for Veterinary Facilities, 1st edition 1996, Canadian Food Inspection Agency (CFIA).

Electronically completed forms are to be submitted to Occupational Health and Safety, (OHS), (Support Services Building, Room 4190 or to jstanle2@uwo.ca) for distribution to the Biohazards Subcommittee. For questions regarding this form, please contact the Biosafety Officer at extension 81135 or biosafety@uwo.ca. If there are changes to the information on this form (excluding grant title and funding agencies), contact Occupational Health and Safety for a modification form. See website: www.uwo.ca/humanresources/biosafety.

Please ensure that all questions are fully and clearly answered. Failure to do so will lead to the form being returned, which will cause delays in your approval and frustration for you and your colleagues on the Committee.

If you are re-submitting this form as requested by the Biohazards Subcommittee, please make modifications to the form in capitals. Please re-submit forms ONLY electronically.

PRINCIPAL INVESTIGATOR:	**David Hess**
DEPARTMENT:	**Physiology and Pharmacology, UWO**
ADDRESS:	**Robarts Research Institute, 100 Perth Drive**
PHONE NUMBER:	**519-663-5777 x24152**
EMERGENCY PHONE NUMBER(S):	**Home 519-601-1989, Cell 519-670-9919**
EMAIL:	**dhess@robarts.ca**

Location of experimental work to be carried out :

Building :	**Robarts Research Institute, Main Lab**	Room(s):	**4250**
Building :	**Robarts Research Institute, Tissue Cult.**	Room(s):	**4244A**
Building :	**Robarts Research Institute, Animal Fac.**	Room(s):	**1284**

***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 16.0, Approvals).**

FUNDING AGENCY/AGENCIES: **Heart and Stroke Foundation of Canada**

GRANT TITLE(S): **Progenitor cell regulation of the vascular regenerative nicche**

UNDERGRADUATE COURSE NAME(IF APPLICABLE): **Not Applicable**

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

Name	UWO E-mail Address Only	Date of Biosafety Training
Gillian Bell	**gbell22@uwo.ca**	**09/2007**
David Putman	**dputman2@uwo.ca**	**09/2008**
Ayesh Seneviratne	**asenevir@uwo.ca**	**09/2010**
Grace Nasri	**gnasri@uwo.ca**	**09/2011**

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

Our research programs involves the isolation of stem cells from primary human bone marrow samples and from primary human umbilical cord blood samples. As such, all of our tissue culture and animal transplantation procedures involve the use of potentially biohazzardous human materials. As such all level 2 Biohazard precautions are followed at all times. Human samples and derived stem cell lines are stored in liquid nitrogen, in a locked room within the main lab, Robarts 4250. Active tissue culture is performed in our locked tissue culture room, Robarts 4244A. Human cells are also transplanted into immunodeficient mice with diabetes or limb ischemia in the Robarts Barrier Facility, Room 1284. All human cell samples, flasks, pipettes etc. are bleached before discarding into the level 2 Biohazzardous waste, and sent for autoclaving before disposal. Mice containing human cells are transported in hepa-filtered cages, processed in a certified biological safety cabnet designated for animal use, and animal carcasses are subsequently incinerated.

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

RATIONALE. Rapid revascularization of diseased or ischemic organs is critical to all regenerative processes, allowing the delivery of circulating cells that formulate a regenerative niche. We have previously established that transplanted human bone marrow (BM) progenitor cells, transiently engrafted ischemic regions, and induced mouse capillary formation and accelerated recovery of limb perfusion. This concept termed "stem cell-mediated vascular regeneration" has emerged as a central process during tissue repair after injury. Recent discoveries describing the functional roles of multipotent mesenchymal-stromal cells (MSC), naturally found as vascular pericytes, and BM-derived hemangiocytes, circulating pro-angiogenic cells of the hematopoietic lineage, have increased the cellular complexity governing the vascular regenerative niche. Limitations persist regarding the capacity of transplanted human cells to stimulate vascular regeneration. Long-term survival of circulating pro-angiogenic cells in the ischemic limb is minimal, limiting the exposure of damaged vasculature to regenerative stimuli. Also, endogenous endothelial cells (EC) that respond to regenerative cues are damaged by chronic ischemic diseases such as atherosclerosis. These barriers provide strong rationale to determine how endothelial precursors, pro-angiogenic hematopoietic cells, and perivascular MSC may be used in concert to produce stable vessels, and to develop improved cell growth and delivery technologies to improve cell therapies.

BACKGROUND. Using high aldehyde dehydrogenase (ALDHhi) activity, an enzyme involved the protection of long-lived cells from oxidative insult, we have identified a novel population of mixed-lineage progenitor cells based on a conserved stem cell function. High ALDH-activity isolates hematopoietic progenitor cells that reconstitute human hematopoiesis in immune-deficient mice, also enriched human BM and UCB samples for expandable colony forming cells with endothelial and mesenchymal functions, rare regenerative cell types difficult to procure using stem cell surface markers. Intravenously transplanted ALDHhi cells exhibit widespread tissue infiltration by non-hematopoietic cells, home to ischemic tissues, and augmented the endogenous revascularization of ischemic muscle tissue. Thus, cell selection using high ALDH-activity isolates multiple expandable progenitor lineages that together direct vessel formation through paracrine mechanisms. Furthermore, our previous studies have identified the novel morphogen Nodal is upregulated in MSC that exhibit a pro-angiogenic secretion profile, and that Nodal may act as a key micro-environmental regulator of angiogenesis.

HYPOTHESES.

(1) Hypoxia will upregulate pro-angiogenic molecule secretion by ALDH-purified progenitor cells from hematopoietic, endothelial and mesenchymal lineages in vitro.

(2) MSC-expression of Nodal (MSC-Nodal) will promote EC or ALDHhi endothelial progenitor survival, proliferation, migration and tubule assembly in 3D tissue scaffolds.

(3) MSC-Nodal combined with endothelial colony forming cells (ECFC) seeded into 3D tissue scaffolds and implanted into the ischemic limb will form new blood vessels, connect with the murine circulation, resulting in recovered perfusion in the ischemic limb.

OBJECTIVES.

(1) To characterize the paracrine activities of ALDHhi hematopoietic, endothelial or mesenchymal progenitor subtypes that co-ordinate pro-angiogenic endothelial cell (EC) functions under low (2%) versus high (20%) oxygen conditions.

(2) To determine the regulatory functions of Nodal expression by MSC (MSC-Nodal, MSC-shNodal) on the generation of a pro-angiogenic niche within 3D tissue scaffolds in vitro.

(3) To optimize neovessel assembly and recovery of perfusion following tissue scaffold implantation into immunodeficient mice with femoral artery ligation-induced limb ischemia.

1.0 Microorganisms

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

Do you use microorganisms that require a permit from the CFIA? ☐ YES ☐ NO
If YES, please give the name of the species ____________________
What is the origin of the microorganism(s)? ____________________

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

Please attach the CFIA permit.

Please describe any CFIA permit conditions:

1.2 Please complete the table below:

Full Scientific Name of Biological Agent(s)* (Be specific)	Is it known to be a human pathogen? YES/NO	Is it known to be an animal pathogen? YES/NO	Is it known to be a zoonotic agent? YES/NO	Maximum quantity to be cultured at one time? (in Litres)	Source/ Supplier	PHAC or CFIA Containment Level
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3

Please attach a Material Safety Data Sheet or equivalent from the supplier if the bacterium used is not on this link:
http://www.uwo.ca/humanresources/docandform/docs/ohs/CFIA_Ecoli_list.pdf

Additional Comments: ____________________

2.0 Cell Culture

2.1 Does your work involve the use of cell cultures? ☒ YES ☐ NO
(If NO, please proceed to Section 3.0)

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

Cell Type	Is this cell type used in your work?	Source of Primary Cell Culture Tissue	AUS Protocol Number
Human	☒ Yes ☐ No	**Bone Marrow and Umbilical Cord Blood**	Not applicable
Rodent	☐ Yes ☒ No		
Non-human primate	☐ Yes ☒ No		
Other (specify)	☐ Yes ☒ No		

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Containment Level of each cell line	Supplier / Source of cell line(s)
Human	☒ Yes ☐ No	**HUVEC, PANC-1**	**1**	**ATCC**
Rodent	☒ Yes ☐ No	**beta TC-6 Cells**	**2**	**ATCC**
Non-human primate	☐ Yes ☒ No			
Other (specify)	☐ Yes ☒ No			

Please attach a Material Safety Data Sheet or equivalent from the supplier. (For more information, see www.atcc.org)

2.4 For above named cell types(s) indicate PHAC or CFIA containment level required ☒ 1 ☒ 2 ☐ 2+ ☐ 3

Additional Comments: _____

3.0 Use of Human Source Materials

3.1 Does your work involve the use of human source materials? ☒ YES ☐ NO
If no, please proceed to Section 4.0

3.2 Indicate in the table below the Human Source Material to be used.

Human Source Material	**Source/Supplier /Company Name**	**Is Human Source Material Infected With An Infectious Agent? YES/UNKNOWN**	**Name of Infectious Agent (If applicable)**	**PHAC or CFIA Containment Level (Select one)**
Human Blood (whole) or other Body Fluid	**LHSC Birthing Center-UCB**	☐ Yes ☒ Unknown		☐1 ☒2 ☐2+ ☐3
Human Blood (fraction) or other Body Fluid		☐ Yes ☐ Unknown		☐1 ☐2 ☐2+ ☐3
Human Organs or Tissues (unpreserved)	**LHSC Oncology Huma Bone Marrow**	☐ Yes ☒ Unknown		☐1 ☒2 ☐2+ ☐3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

Additional Comments: _____

4.0 Genetically Modified Organisms and Cell lines

4.1 Will genetic modifications be made to the microorganisms, biological agents, or cells described in Sections 1.0 and 2.0? ☐ YES ☒ NO If **NO**, please proceed to Section 5.0

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

Bacteria Used for Cloning *	Plasmid(s) **	Source of Plasmid	Gene Transformed or Transfected	Will there be a change due to transformation of the bacteria?	Will there be a change in the pathogenicity of the bacteria after the genetic modification?	What are the consequences due to the transformation of the bacteria?	If plasmids are being used to transfect cells what is the consequence on the eukaryotic cells?

**** Please attach a Material Safety Data Sheet or equivalent if available.***
***** Please attach a plasmid map.***
******No Material Safety Data Sheet is required for the following strains of E. coli:***
http://www.uwo.ca/humanresources/docandform/docs/ohs/CFIA_Ecoli_list.pdf

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

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

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

4.3.1 Will virus be replication defective? ☐ YES ☐ NO

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

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

5.0 Will genetic sequences from the following be involved?

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

5.1 Is any work being conducted with prions or prion sequences? ☒ NO ☐ YES

Additional Comments: _____

6.0 Human Gene Therapy Trials

6.1 Will human clinical trials be conducted involving a biological agent? ☐ YES ☒ NO
(including but not limited to microorganisms, viruses, prions, parasites or pathogens of plant or animal origin)
If no, please proceed to Section 7.0

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

6.3 Will the biological agent be able to replicate in the host? ☐ YES ☐ NO

6.4 How will the biological agent be administered?

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

6.6 Has human ethics approval been obtained? ☐ YES, number: ☐ NO ☐ PENDING

7.0 Biological Toxins and Hormones

7.1 Will toxins or hormones of biological origin be used? ☒ YES ☐ NO If **NO**, please proceed to Section 8.0

7.2 If YES, please name the toxin(s) or hormones(s) **streptozotocin**
Please attach information, such as a Material Safety Data Sheet, for the toxin(s) used.

7.3 What is the LD_{50} (specify species) of the toxin or hormone **5,150mg/kg (rat)**

7.4 How much of the toxin or hormone is handled at one time*? **15mg powder aliquots are solubilized for each day of injections**

7.5 How much of the toxin or hormone is stored*? **Ordered in a 1g vial (powder)**

7.6 Will any biological toxins or hormones be used in live animals? ☒ YES ☐ NO
If **YES**, Please provide details: **STZ is i.p. injected into mice at 35mg/kg/day for 5 days**

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

Additional Comments: **may cause cancer if injested in large quantities.**

8.0 Animal Experiments

8.1 Will live animals be used? ☒ YES ☐ NO If **NO**, please proceed to section 9.0

8.2 List animal species to be used: **NOD/SCID, NOD/SCID Il-2R gamma null**

8.3 AUS protocol number(s): **2006-122, 2006-126**

8.4 List the location(s) for the animal experimentation and housing: **Robarts Barrier Facility**

8.5 Will any of the agents listed in Sections 1-7 be used in live animals
☐ NO ☒ YES, specify: **STZ**

8.6 Will the agent(s) be shed by the animal:
☒ YES ☐ NO, please justify:

8.7 Indicate the PHAC or CFIA containment level used: ☐ 1 ☒ 2 ☐ 2+ ☐ 3

9.0 Use of Animal species with Zoonotic Hazards

9.1 Will any animals with zoonotic hazards or their organs, tissues, lavages or other body fluids including blood be used (see list below)? ☐ YES ☒ NO - If **NO**, please proceed to section 10.0

9.2 Will live animals be used? ☐ YES ☒ NO

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

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

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

10.0 Insects

10.1 Do you use insects? ☐ YES ☒ NO - If **NO**, please proceed to Section 11.0

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

10.3 What is the origin of the insect?

10.4 What is the life stage of the insect?

10.5 What is your intention? ☐ Initiate and maintain colony, give location:
☐ "One-time" use, give location:

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

10.7 Do you use insects that require a permit from the CFIA permit? ☐ YES ☐ NO
If **YES**, Please attach the CFIA permit & describe any CFIA permit conditions:

11.0 Plants

11.1 Do you use plants? ☐ YES ☒ NO - If **NO**, please proceed to Section 12.0

11.2 If YES, please give the name of the species.

11.3 What is the origin of the plant?

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

11.5 What is your intention? ☐ Grow and maintain a crop ☐ "One-time" use

11.6 Do you do any modifications to the plant? ☐ YES ☐ NO
If yes, please describe:

11.7 Please describe the risk (if any) of loss of the material from the lab and how this will be mitigated:

11.8 Is the CFIA permit attached? ☐ YES ☐ NO ☐ PENDING
If **YES**, Please attach the CFIA permit & describe any CFIA permit conditions:

12.0 Import Requirements

12.1 Will any of the above agents be imported? ☐ YES, country of origin ☒ NO
If **NO**, please proceed to Section 13.0

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

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

12.4 Has the import permit been sent to OHS? ☐ YES, please provide permit # ☐ NO

13.0 Training Requirements for Personnel Named on Form

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

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

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

An X in the check box indicates you agree with the above statement... ☒
Enter Your Name David Hess ***Date:*** July 17, 2012

14.0 Containment Levels

14.1 For the work described in sections 1.0 to 9.0, please indicate the highest PHAC or CFIA Containment Level required. ☐ 1 ☒ 2 ☐ 2+ ☐ 3

14.2 Has the facility been certified by OHS for this level of containment?
☒ YES, location and date of most recent biosafety inspection: **Feb. 2012**
☐ NO, please certify
☐ NOT REQUIRED for Level 1 containment

14.3 Please indicate permit number (not applicable for first time applicants):

15.0 Procedures to be Followed

15.1 Are additional risk reduction measures necessary beyond containment level 1, 2, 2+ or 3 measures that are unique to these agents? ☐ YES ☒ NO
If **YES** please describe:

15.2 Please outline what will be done if there is an exposure to the biological agents listed such as a needlestick injury or an accidental splash:
The supervisor will be notified immediately of any exposure. Exposure site will be washed with soap and water for 15-20 minutes. Laboratory staff will be brought to the Staff/Faculty Health Services and treated accordingly. Supervisor will notify Safety Officer (Ron Noseworthy) and an Accident/Incident Investigation Form will be completed by the supervisor and sent to Rehabilitation Services

15.3 As the Principal Investigator, I will ensure that this project will follow the Western Biosafety Guidelines and Procedures Manual for Containment Level 1 & 2 Laboratories (and the Level 3 Facilities Manual for Level 3 projects). I will ensure that UWO faculty, staff and students working in my laboratory have an up-to-date Hazard Communication Form, found at http://www.shs.uwo.ca/workplace/workplacehealth.html

Please print and sign this page and submit it. This signature page is needed for approval.

Researcher: SIGNATURE: David Hess
Date: August 6, 2012

15.4 Additional Comments: _____

16.0 Approvals

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

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

3) Safety Officer for Institution where experiments will take place (~~if not UWO~~):
SIGNATURE: Ronald Noseworthy
Date: August 07, 2012

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

Special Conditions of Approval:

ATCC

Product Information S

Cell Line Info

Cell Line Designation: HUV-EC-C
ATCC Catalog No. CRL-1730™

Table of Contents:

Cell Line Description

Organism: *Homo sapiens* (human)
Tissue: umbilical vein; vascular endothelium
Morphology: endothelial
Growth Properties: adherent
Tumorigenic: the cells were not tumorigenic in immunosuppressed mice, but did form colonies in semisolid medium.
DNA profile (STR analysis):

Amelogenin: X
CSF1PO: 11,12
D13S317: 9,11
D16S539: 11,12
D5S818: 11,12
D7S820: 8,12
TH01: 6,9.3
TPOX: 8,11
vWA: 16

Products: factor VIII
Depositors: H. Hoshi
Comments: Endothelial Cell Growth Supplement (ECGS) and unidentified factors from bovine pituitary, hypothalamus or whole brain extracts are mitogenic for this line.
The cells have a life expectancy of 50 to 60 population doublings.
Karyotype: Karyology performed for one batch of CRL-1730™ .in 1996 reflected a hypodiploid human cell line with a modal chromosome number of 45 occurring in 72% of the cells counted, all of which had monosomic N13. The rate of polyploid cells among this population was 15.8%. This karyology differed from earlier work-ups performed on the cells that showed approximately 60% of the cells retained 2 chromosomes 13. The apparent clonal variation in cultures of CRL-1730 (most likely dependent upon passage and growth conditions) has also been noted in STR profiles with unstable alleles at D13S317 allele #9, D13S317 allele #11, and D7S820 allele #12. Other coexisting subclones include those with 46,XX,-11,-13,i(11p),i(11q) and 46,XX,+11,-13 karyotypes. For all karyotypes performed, both X chromosomes appear normal.

Biosafety Level: 1

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: *Biosafety in Microbiological and Biomedical Laboratories,* 5th ed. HHS Publication No. (CDC) 93-8395. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Washington DC: U.S. Government Printing Office; 2007. The entire text is available online at www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm

Use Restrictions

These cells are distributed for research purposes only. ATCC recommends that individuals contemplating commercial use of any cell line first contact the originating investigator to negotiate an agreement. Third party distribution of this cell line is discouraged, since this practice has resulted in the unintentional spreading of contaminated cell lines.

Handling Procedure for Frozen Cells

To insure the highest level of viability, thaw the vial and initiate the culture as soon as possible upon receipt. If upon arrival, continued storage of the frozen culture is necessary, it should be stored in liquid nitrogen vapor phase and not at –70°C. Storage at –70°C will result in loss of viability.

SAFETY PRECAUTION: ATCC highly recommends that protective gloves and clothing always be used and a full face mask always be worn when handling frozen vials. *It is important to note that some vials leak when submersed in liquid nitrogen and will slowly fill with liquid nitrogen. Upon thawing, the conversion of the liquid nitrogen back to its gas phase may result in the vessel exploding or blowing off its cap with dangerous force creating flying debris.*

1. Thaw the vial by gentle agitation in a 37°C water bath. To reduce the possibility of contamination, keep the O-ring and cap out of the water. Thawing should be rapid (approximately 2 minutes).

2. Remove the vial from the water bath as soon as the contents are thawed, and decontaminate by dipping in or spraying with 70% ethanol. *All of the operations from this point on should be carried out under strict aseptic conditions.*

3. Transfer the vial contents to a centrifuge tube containing 9.0 ml complete culture medium. and spin at approximately 125 xg for 5 to7 minutes.

4. Resuspend cell pellet with the recommended complete medium (see the specific batch information for the culture recommended dilution ratio). and dispense into

5. a new culture flask. *It is important to avoid excessive alkalinity of the medium during recovery of the cells. It is suggested that, prior to the addition of the vial contents, the culture vessel containing the complete growth medium be placed into the incubator for at least 15 minutes to allow the medium to reach its normal pH (7.0 to 7.6). pH (7.0 to 7.6).*

6. Incubate the culture at 37°C in a suitable incubator. A 5% CO_2 in air atmosphere is recommended if using the medium described on this product sheet

Handling Procedure for Flask Cultures

The flask was seeded with cells (see specific batch information) grown and completely filled with medium at ATCC to prevent loss of cells during shipping.

1. Upon receipt visually examine the culture for macroscopic evidence of any microbial contamination. Using an inverted microscope (preferably equipped with phase-contrast optics), carefully check for any evidence of microbial contamination. Also check to determine if the majority of cells are still attached to the bottom of the flask; during shipping the cultures are sometimes handled roughly and many of the cells often detach and become suspended in the culture medium (but are still viable).

2. **If the cells are still attached,** aseptically remove all of the growth medium except for approximately 5 to 10 ml to cover the floor of the flask. The old medium can be saved for reuse. Incubate the cells at 37°C in a 5% carbon dioxide gas phase until they are ready to be subcultured.

3. **If the cells are not attached,** aseptically remove the entire contents of the flask and centrifuge at 125 xg for 5 to 10 minutes to spin down the suspended cells into a soft pellet. Remove all but 5 ml of supernatant medium, then resuspend the cells in the remaining medium and add back to a 25 cm^2 flask. The old medium can be saved for reuse. Incubate at 37°C in a 5% carbon dioxide gas phase until they are ready to be subcultured.

Subculturing Procedure

Volumes used in this protocol are for 75 cm2 flask; proportionally reduce or increase amount of dissociation medium for culture vessels of other sizes.

1. Remove and discard culture medium.

2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin-0.53mM 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 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.
Subcultivation ratio : 1:2 to 1:3.

6. Incubate cultures at 37°C.

Note: For more information on enzymatic dissociation and subculturing of cell lines consult Chapter 13 in **Culture Of Animal Cells: A Manual Of Basic Technique** by R. Ian Freshney, 5th edition, published by Wiley-Liss, N.Y., 2005.

Medium Renewal

Two to three times weekly.

Complete Growth Medium

The base medium for this cell line is ATCC-formulated of F-12K Medium, Catalog No. 30-2004.
To make the complete growth medium, add the following components to the base medium:

- 0.1mg/ml heparin
- 0.03-0.05 mg/ml endothelial cell growth supplement (ECGS)
- fetal bovine serum to a final concentration of 10%

This medium is formulated for use with a 5% carbon dioxide gas phase.
ATCC tested fetal bovine serum is available as ATCC Catalog No. 30-2020.
Note: A high quality ECGS prepared from bovine neural tissue (Sigma Cat # E-2759 or equivalent) should be used to propagate CRL-1730™. It is best to initiate the cells with the highest recommended concentration of ECGS.

Cryoprotectant Medium

Complete growth medium described above supplemented with 5% (v/v) DMSO. Cell culture tested DMSO is available as ATCC Catalog No. 4-X.

Additional Information

Additional product and technical information can be obtained from the catalog references and the ATCC Technical Information site at www.atcc.org, or by e-mail at tech@atcc.org.

References

(additional references may be available in the catalog at www.atcc.org)

Hoshi H. And McKeehan W.L. (1984), **Brain- and liver cell-derived factors are required for growth of human endothelial cells in serum-free culture.** Proc. Natl. Acad. Sci. USA 81:6413-6417. PubMed: 6333682.

Zahedi K. (1997), **Characterization of the binding of serum amyloid P to laminin**. J. Biol. Chem. 272:2143-2148. PubMed: 97152982.

Soker S. et al. (1996), **Characterization of novel vascular endothelial growth factor (VEGF) receptors on tumor cells that bind VEGF165 via its exon 7-endoded domain**. J. Biol. Chem. 271:5761-5767. PubMed: 96215040.

Hay, R. J., Caputo, J. L., and Macy, M. L., Eds. (1992), **ATCC Quality Control Methods for Cell Lines**. 2nd edition, Published by ATCC.

Caputo, J. L., **Biosafety procedures in cell culture**. J. Tissue Culture Methods **11**:223-227, 1988.

Fleming, D.O., Richardson, J. H., Tulis, J.J. and Vesley, D., (1995) **Laboratory Safety: Principles and Practice**. Second edition, ASM press, Washington, DC.

ATCC Warranty

The viability of ATCC products is warranted for 30 days from the date of shipment. If you feel there is a problem with this product, contact Technical Services by phone at 800-638-6597 (U.S., Canada, and Puerto Rico) or 703-365-2700 (elsewhere) or by e-mail at tech@atcc.org.

Disclaimers

This product is intended for laboratory research purposes only. It is not intended for use in humans.

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This product is sent with the condition that you are responsible for its safe storage, handling, and use. ATCC is not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to insure authenticity and reliability of strains on deposit, ATCC is not liable for damages arising from the misidentification or misrepresentation of cultures.

Please see the enclosed Material Transfer Agreement (MTA) for further details regarding the use of this product. The MTA is also available on our Web site at www.atcc.org.

Cell Line Designation: PANC-1
ATCC® Catalog No. CRL-1469

Table of Contents:

Cell Line Description

Organism: *Homo sapiens* (human)
Tissue: pancreas; duct; epithelioid carcinoma
Age: 56 years
Gender: male
Ethnicity: caucasian
Morphology: epithelial
Growth properties: adherent
DNA profile (STR analysis)

Amelogenin: X
CSF1PO: 10,12
D13S317: 11
D16S539: 11
D5S818: 11,13
D7S820: 8,10
TH01: 7,8
TPOX: 8,11
vWA: 15

Depositors: M. Lieber
Comments: Growth is inhibited by 1 unit/ml L-asparaginase. The cells will grow in soft agar.
Karyotype: Chromosome studies indicate a modal number of 63 with 3 distinct marker chromosomes and a small ring chromosome. This is a hypertriploid human cell line. The modal chromosome number was 61, occurring in 32% of cells. However, cells with 63 chromosomes also occurred at a high frequency (22%). The rate of cells with higher ploidies was 8.5%.
Note: Cytogenetic information is based on initial seed stock at ATCC. Cytogenetic instability has been reported in the literature for some cell lines.

Biosafety Level: 1

This cell line is not known to harbor an agent known to cause disease in healthy adult humans. Handle as a potentially biohazardous material under at least Biosafety Level 1 containment. This cell line has **NOT** been screened for Hepatitis B, human immunodeficiency viruses or other adventitious agents. Cell lines derived from primate lymphoid tissue may fall under the regulations of 29 CFR 1910.1030 Bloodborne Pathogens. ATCC recommends that appropriate safety procedures be used when handling all cell lines, especially those derived from human or other primate material. Detailed discussions of laboratory safety procedures are provided in **Laboratory Safety: Principles and Practice** (Fleming et al., 1995) the ATCC manual on quality control (Hay et al., 1992), the Journal of Tissue Culture Methods(Caputo, 1988), and in the U.S. Government Publication, ***Biosafety in Microbiological and Biomedical Laboratories***, 4th ed. HHS Publication No. (CDC) 93-8395. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Washington DC: U.S. Government Printing Office; 1999. The entire text is available online at www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm

Use Restrictions

These cells are distributed for research purposes only. ATCC recommends that individuals contemplating commercial use of any cell line first contact the originating investigator to negotiate an agreement. Third party distribution of this cell line is discouraged, since this practice has resulted in the unintentional spreading of cell lines contaminated with inappropriate animal cells or microbes.

Handling Procedure for Frozen Cells

To insure the highest level of viability, thaw the vial and initiate the culture as soon as possible upon receipt. If upon arrival, continued storage of the frozen culture is necessary, it should be stored in liquid nitrogen vapor phase and not at –70°C. Storage at –70°C will result in loss of viability.

SAFETY PRECAUTION: ATCC highly recommends that protective gloves and clothing always be used and a full face mask always be worn when handling frozen vials. *It is important to note that some vials leak when submersed in liquid nitrogen and will slowly fill with liquid nitrogen. Upon thawing, the conversion of the liquid nitrogen back to its gas phase may result in the vessel exploding or blowing off its cap with dangerous force creating flying debris.*

1. Thaw the vial by gentle agitation in a 37°C water bath. To reduce the possibility of contamination, keep the O-ring and cap out of the water. Thawing should be rapid (approximately 2 minutes).

2. Remove the vial from the water bath as soon as the contents are thawed, and decontaminate by dipping in or spraying with 70% ethanol. *All of the operations from this point on should be carried out under strict aseptic conditions.*

3. Transfer the vial contents to a centrifuge tube containing 9.0 ml complete culture medium and spin at approximately 125 xg for 5 to7 minutes.

4. Resuspend cell pellet with the recommended complete growth medium (see the specific batch information for the culture recommended dilution ratio) and dispense into a 25 cm^2 or a 75 cm^2 culture flask. *It is important to avoid excessive alkalinity of the medium during recovery of the cells. It is suggested that, prior to the addition of the vial contents, the culture vessel containing the complete growth medium be placed into the incubator for at least 15 minutes to allow the medium to reach its normal pH (7.0 to 7.6).*

American Type Culture Collection
P.O. Box 1549
Manassas, VA 20108 USA
www.atcc.org

800-638-6597 (U.S., Canada, and Puerto Rico)
703-365-2700
Fax: 703-365-2750
E-mail: tech@atcc.org

5. Incubate the culture at 37°C in a suitable incubator. A 5% CO_2 in air atmosphere is recommended if using the medium described on this product sheet.

Handling Procedure for Flask Cultures

The flask was seeded with cells (see specific batch information) grown and completely filled with medium at ATCC to prevent loss of cells during shipping.

1. Upon receipt visually examine the culture for macroscopic evidence of any microbial contamination. Using an inverted microscope (preferably equipped with phase-contrast optics), carefully check for any evidence of microbial contamination. Also check to determine if the majority of cells are still attached to the bottom of the flask; during shipping the cultures are sometimes handled roughly and many of the cells often detach and become suspended in the culture medium (but are still viable).

2. **If the cells are still attached,** aseptically remove all but 5 to 10 ml of the shipping medium. The shipping medium can be saved for reuse. Incubate the cells at 37°C in a 5% CO_2 in air atmosphere until they are ready to be subcultured.

3. **If the cells are not attached,** aseptically remove the entire contents of the flask and centrifuge at 125 xg for 5 to 10 minutes. Remove shipping medium and save. Resuspend the pelleted cells in 10 ml of this medium and add to 25 cm^2 flask. Incubate at 37°C in a 5% CO_2 in air atmosphere until cells are ready to be subcultured.

Subculturing Procedure

Volumes used in this protocol are for 75 cm2 flask; proportionally reduce or increase amount of dissociation medium for culture vessels of other sizes.

1. Remove and discard culture medium.

2. Briefly rinse the cell layer with 0.25% (w/v) Trypsin-053mM 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 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.
Subcultivation Ratio: 1:2 to 1:4.

6. Incubate cultures at 37°C.

Note: For more information on enzymatic dissociation and subculturing of cell lines consult Chapter 10 in ***Culture of Animal Cells, a manual of Basic Technique*** by R. Ian Freshney, 3rd edition, published by Alan R. Liss, N.Y., 1994.

Medium Renewal

2 to 3 times weekly.

Complete Growth Medium

The base medium for this cell line is ATCC-formulated Dulbecco's Modified Eagle's Medium, Catalog No. 30-2002.
To make the complete growth medium, add the following components to the base medium:

- fetal bovine serum to a final concentration of 10%

This medium is formulated for use with a 5% CO_2 in air atmosphere. (Standard DMEM formulations contain 3.7 g/L sodium bicarbonate and a 10% CO_2 in air atmosphere is then recommended).
ATCC tested fetal bovine serum is available as ATCC Catalog No. 30-2020.

Cryoprotectant Medium

Complete growth medium described above supplemented with 5% (v/v) DMSO.

Cell culture tested DMSO is available as ATCC Catalog No. 4-X.

Additional Information

Additional product and technical information can be obtained from the catalog references and the ATCC Web site at www.atcc.org, or by e-mail at tech@atcc.org.

References

(additional references are available in the catalog at www.atcc.org)

Lieber, M. et al. **Establishment of a continuous tumor-cell line (panc-1) from a human carcinoma of the exocrine pancreas.** Int. J. Cancer 15: 741-747, 1975 PubMed: 75188660

Wu, M.C. et al. **Mechanism of sensitivity of cultured pancreatic carcinoma to asparaginase.** Int. J. Cancer 22: 728-733, 1978 PubMed: 79066904

Hay, R. J., Caputo, J. L., and Macy, M. L., Eds. (1992), **ATCC Quality Control Methods for Cell Lines.** 2nd edition, Published by ATCC.

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Fleming, D.O., Richardson, J. H., Tulis, J.J. and Vesley, D., (1995) **Laboratory Safety: Principles and Practice.** Second edition, ASM press, Washington, DC.

Centers for Disease Control (1993), **Biosafety in Microbiological and Biomedical Laboratories** Human Health Service Publication No. (CDC) 93-8395. U.S. Dept. of Health and Human Services; 3rd Edition U.S. Government Printing Office Washington D.C.

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07/07

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ATCC Advanced Catalog Search » **Product Details**

Product Description

Before submitting an order you will be asked to read and accept the terms and conditions of ATCC's **Material Transfer Agreement** (NEW) or, in certain cases, an MTA specified by the depositing institution.

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

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Cell Biology

ATCC® Number: CRL-11506™ Order this Item

Price: **$431.00 (for-profit list price)**
$359.17 (non-profit list price)
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Designations:	Beta-TC-6
Depositors:	CytoTherapeutics, Inc.
Biosafety Level:	2 [Cells contain SV40 viral DNA Sequences]
Shipped:	frozen
Medium & Serum:	See Propagation
Growth Properties:	adherent
Organism:	*Mus musculus*, transgenic for SV40 large T antigen deposited as mouse, transgenic for SV40 large T antigen
Morphology:	epithelial
	PHOTO
Source:	**Organ:** pancreas **Disease:** insulinoma **Cell Type:** beta cell;
Cellular Products:	insulin, glucagon and somatostatin
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:	The cell line was derived from a pancreatic tumor (insulinoma) arising in a transgenic mouse. They secrete insulin in response to glucose.
Comments:	The cell line was derived from a pancreatic tumor (insulinoma) arising in a transgenic mouse. The mouse carried the pseudogene construct composed of the SV40 early region controlled by the rat insulin II gene promotor. The cells contain abundant insulin and small amounts of glucagon and somatostatin. They secrete insulin in response to glucose.

Related Links

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

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Biosafety Levels

ATCC products are sent with the condition that you are responsible for their safe storage, handling, and use. ATCC is not liable for damages or injuries resulting from receipt and/or use of ATCC materials.

ATCC has classified cultures and related products by biosafety level (BSL) for purposes of packaging for safe shipment. The classification is based on assessment of the potential risk using U.S. Public Health Service guidelines, background information on the material provided by the depositor and review of the material by ATCC scientists familiar with the material. Each item is evaluated individually and in some cases the ATCC assigned biosafety level is more restrictive. Those items in BSL-1 are not known to cause disease in healthy adult humans. Materials in BSL-2 present a moderate risk and should be handled under BSL-2 guidelines. Handling of BSL-3 strains requires the use of BSL-3 laboratory practices and containment. All infectious materials should be handled under the supervision of a competent and knowledgeable scientist. It is ultimately the recipient's and their institution's responsibility to determine the biosafety level and work with the material under the appropriate containment for the laboratory manipulations being performed.

The Web site for the CDC's Office of Health and Safety has complete descriptions of the biosafety levels in the text of the publication *Biosafety in Microbiological and Biomedical Laboratories*, (BMBL) 5th Edition (HHS Publication No. (CDC) 93-8395. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Institutes of Health; U.S. Government Printing Office: Washington DC; 2007). It is available in its entirety online. Information on agent risk assessment may be found in the Agent Summary Statements of this publication.

The actual risk associated with handling a biological agent depends not only on the nature of the agent, but also on the laboratory manipulations employed during its handling. It is incumbent upon each recipient of an ATCC culture or product to fully assess the potential risk of working with it in their laboratory. To help you in that assessment we have provided the references below.

- For further information on the classification of human etiologic agents, please consult the U.S. Department of Health and Human Services, Centers for Disease Control and Prevention's Office of Health and Safety.
- For guidelines for research involving recombinant DNA molecules, please consult the U.S. Department of Health and Human Services, National Institutes of Health Office of Biotechnology Activities.
- For further information on the classification of contagious or infectious diseases of animals or plant pests, please consult the U.S. Department of Agriculture, Animal and Plant Health Inspection Service.
- American Biological Safety Association
- Public Health Agency of Canada - Population and Public Health Branch

Toxin Info

SIGMA-ALDRICH

sigma-aldrich.com

Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Version 4.4 Revision Date 04/26/2012 Print Date 07/18/2012

: Sigma-Aldrich Corporation 3050 Spruce St. St. Louis, Missouri 63103 USA

Product name :

Streptozocin

Product Number Brand Product Use

Supplier

Telephone Fax Emergency Phone # (For both supplier and manufacturer) Preparation Information

2. HAZARDS IDENTIFICATION Emergency Overview

Target Organs

: S0130 : Sigma : For laboratory research purposes.

: Sigma-Aldrich Canada, Ltd 2149 Winston Park Drive OAKVILLE ON L6H 6J8 CANADA

: +1 9058299500 : +1 9058299292 : 1-800-424-9300

: Sigma-Aldrich Corporation Product Safety - Americas Region 1-800-521-8956

Manufacturer

Pancreas., Liver, Kidney, Blood, Reproductive system.Pancreas., Liver, Kidney, Blood, Reproductive system.

WHMIS Classification

D2A Very Toxic Material Causing Other Toxic Effects D2BToxic Material Causing Other Toxic Effects

GHS Classification

Carcinogenicity (Category 1B)

GHS Label elements, including precautionary statements

Carcinogen Mutagen

Pictogram

Signal word

Hazard statement(s) H350

Precautionary statement(s) P201 P308 + P313

HMIS Classification Health hazard:

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

Potential Health Effects Inhalation

Danger May cause cancer.

Obtain special instructions before use. IF exposed or concerned: Get medical advice/ attention.

0 * 0 0

May be harmful if inhaled. May cause respiratory tract irritation.**Skin Eyes Ingestion**

May be harmful if absorbed through skin. May cause skin irritation. May cause eye irritation. May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms

Formula Molecular Weight

4. FIRST AID MEASURES General advice

: *N*-(Methylnitrosocarbamoyl)-α-D-glucosamine Streptozotocin

: C8H15N3O7 : 265.22 g/mol

CAS-No.

EC-No.

Index-No.

Concentration

Streptozocin

18883-66-4

242-646-8

-

-
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

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

Flush eyes with water as a precaution.

If swallowed

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

5. FIREFIGHTING MEASURES Conditions of flammability

Not flammable or combustible.

Suitable extinguishing media

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

Special protective equipment for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

Explosion data - sensitivity to mechanical impact

no data available

Explosion data - sensitivity to static discharge

no data available

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. 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.

Conditions for safe storage

Keep container tightly closed in a dry and well-ventilated place. Recommended storage temperature: -20 °C hygroscopic Store under inert gas. Moisture sensitive. Keep in a dry place.

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 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. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Immersion protection Material: Nitrile rubber Minimum layer thickness: 0.11 mm Break through time: > 480 min Material tested:Dermatril® (Aldrich Z677272, Size M)

Splash protection Material: Nitrile rubber Minimum layer thickness: 0.11 mm Break through time: > 30

min Material tested:Dermatril® (Aldrich Z677272, Size M)
data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 873000, e-mail sales@kcl.de, test method: EN374 If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an Industrial Hygienist familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Eye protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin and body protection

impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures

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

Specific engineering controls

Use mechanical exhaust or laboratory fumehood to avoid exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES Appearance

Form powder Sigma - S0130

Colour

Safety data

pH
Melting point/freezing point
Boiling point
Flash point
Ignition temperature
Autoignition temperature
Lower explosion limit Upper explosion limit Vapour pressure Density
Water solubility
Partition coefficient: n-octanol/water
Relative vapour density
Odour Odour Threshold Evaporation rate
light yellow
no data available Melting point/range: 121 °C (250 °F) - dec.
no data available no data available no data available no data available
no data available no data available no data available no data available soluble
no data available no data available
no data available no data available no data available

10. STABILITY AND REACTIVITY Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

no data available

Conditions to avoid

no data available

Materials to avoid

Strong oxidizing agents, Strong acids, Strong bases

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx) Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION Acute toxicity

Oral LD50

LD50 Oral - rat - 5,150 mg/kg

Inhalation LC50

no data available

Dermal LD50

no data available

Other information on acute toxicity

no data available
Skin corrosion/irritation
no data available
Serious eye damage/eye irritation
no data available
Respiratory or skin sensitization
no data available
Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
Genotoxicity in vitro - Human - Kidney DNA damage
Genotoxicity in vitro - rat - Liver Unscheduled DNA synthesis
Genotoxicity in vitro - Hamster - Lungs Sister chromatid exchange
Genotoxicity in vivo - rat - Oral DNA damage
Genotoxicity in vivo - rat - Intraperitoneal Unscheduled DNA synthesis
Carcinogenicity
Possible human carcinogen
IARC: 2B - Group 2B: Possibly carcinogenic to humans (Streptozocin)
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
Reproductive toxicity
no data available
Teratogenicity
no data available
Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available
Aspiration hazard
no data available
Potential health effects
Inhalation Ingestion Skin Eyes
May be harmful if inhaled. May cause respiratory tract irritation. May be harmful if swallowed. May be harmful if absorbed through skin. May cause skin irritation. May cause eye irritation.
Signs and Symptoms of Exposure
Vomiting
Synergistic effects
no data available
Additional Information
RTECS: LZ5775000
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
Offer surplus and non-recyclable solutions to a licensed disposal company. 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.

Contaminated packaging
Dispose of as unused product.
14. TRANSPORT INFORMATION
DOT (US)
UN number: 3077 Class: 9 Packing group: III Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Streptozocin) Reportable Quantity (RQ): 1 lbs Marine pollutant: No Poison Inhalation Hazard: No
IMDG
Not dangerous goods
IATA
Not dangerous goods
15. REGULATORY INFORMATION WHMIS Classification

D2A D2B
Very Toxic Material Causing Other Toxic Effects Toxic Material Causing Other Toxic Effects Carcinogen Mutagen
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.
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 Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Western
UNIVERSITY · CANADA

TOXIN USE RISK ASSESSMENT

Name of Toxin:	Streptozotocin
Proposed Use Dose:	15000 µg
Proposed Storage Dose:	1000000 µg
LD $_{50}$ (species):	5150000 µg

Calculation:

5150000 µg/kg x 50 kg/person

Dose per person based on LD $_{50}$ in µg = 257500000

LD_{50} per person with safety factor of 10 based on LD_{50} in µg = 25750000

Comments/Recommendations: