The University *of* Western Ontario
BIOLOGICAL AGENTS REGISTRY FORM
Approved Biohazards Subcommittee: October 14, 2011
Biosafety Website: www.uwo.ca/humanresources/biosafety/

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

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

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

Electronically completed forms are to be 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 bold print, highlighted in yellow. Please re-submit forms electronically.

PRINCIPAL INVESTIGATOR:	**Christopher G. Guglielmo**
DEPARTMENT:	**Biology**
ADDRESS:	**1151 Richmond St. N. London, ON N6A 5B7**
PHONE NUMBER:	**519-661-2111 X81204**
EMERGENCY PHONE NUMBER(S):	**519-642-2453**
EMAIL:	**cguglie2@uwo.ca**

Location of experimental work to be carried out :

Building :	**Biological and Geological Sciences**	Room(s):	**3012**
Building :	**Adanced Facility for Avian Research**	Room(s):	**216**
Building :		Room(s):	

***For work being performed at Institutions affiliated with the University of Western Ontario, the Safety Officer for the Institution where experiments will take place must sign the form prior to its being sent to the University of Western Ontario Biosafety Officer (See Section 15.0, Approvals).**

FUNDING AGENCY/AGENCIES: **NSERC**

GRANT TITLE(S): **Mechanisms of fuel use and water balance during flight and refueling in migratory birds and bats**

UNDERGRADUATE COURSE NAME(IF APPLICABLE):

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

Name	UWO E-mail Address	Date of Biosafety Training
Liam McGuire	**lmcguir5@uwo.ca**	**Oct 2006**
Alexander Gerson	**agerson2@uwo.ca**	**Oct 2011**
Silke Nebel	**snebel2@uwo**	**Sep 2009**
Kristin Jonasson	**kjonasso@uwo.ca**	**Dec 2011**
Caitlin Vandermeer	**cvande67@uwo.ca**	**Oct 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.

Primarily we work with wild birds and bats of unknown health status. All blood and tissue samples are handled accordingly and anything that comes in contact with them is autoclaved or disinfected before disposal or reuse. Anyone working with bats is vaccinated for rabies and tracked by UWO Health Services (McGuire, Jonasson). Samples are stored in a labeled freezer and only those approved to handle the materials are allowed access.

We also use micro-organisms for "bacterial killing assays". For this the organisms are plated onto agar plates with and without the addition of blood collected from birds. The ability of the blood to reduce the survival of organisms and colony formation is used as an index of the immunocompetence of the bird. These microbes are stored and handled in room 216 of the AFAR only which has a biosafety cabinet, autoclave, refrigerator (where they are stored) and sink. We mostly use level 1 organisms but may use level 2.

We use lipopolysaccharide (LPS), a cell wall derivitive of bacteria to induce the acute phase response in birds. By injecting LPS we can mimic an infection and test for effects on bird behaviour and metabolism.

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

My lab conducts physiological studies of migratory birds and bats. In the laboratory we work with captive birds that have been obtained from the wild. They are trained to fly in our wind tunnel to simulate migration. We manipulate the atmospheric conditions the birds fly in to study how factors like humidity, temperature and altitude affect metabolism. We also manipulate the physiology of the birds through changes in photoperiod, endocrine factors, or immune status to see how these affect migration ability. Finally we use flight as an exercise treatment to see how it affects immunocompetence, energy status and behaviour.

In the field we conduct studies of free living birds and bats. Birds and bats are captured during migratory refueling and their physiology is measured through blood sampling and body composition analysis (magnetic resonance analysis). Some animals are marked with radio transmitters so that we can track their movements after capture. We also intend to manipulate the animal's immune status by challenging them with a simulated infection (LPS) and then following how they respond. In some cases birds are held for several days to study their digestive function during refueling. Birds and bats are occassionally held for a day to measure their metabolic rates using a respirometry system.

The objective of these studies is to understand the physiological aspects of migration in birds and bats so that we can improve long term conservation efforts. Changes in the atmosphere due to climate change may affect fuel use and water balance during flight. Changes in habitat will affect refueling. If we better understand the factors influencing migratory flight and refueling then we can better predict how birds and bats will respond to environmental change.

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 **Staphylococcus aureus subsp. aureus Rosenbach**
What is the origin of the microorganism(s)? **Pulse Scientific Inc., Burlington, Ontario, http://www.pulsescientific.com**

Please describe the risk (if any) of escape and how this will be mitigated:
The microorganism is contained in pellet form inside a secure tube with a screw lid. The risk of escape is therefore minimal. All handling will take place in biosafety cabinet with the doors of the room closed.

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
Staphylococcus aureus subsp. aureus Rosenb.	☐ Yes ☒ No	☐ Yes ☒ No	☒ Yes ☐ No	**40mL**	**Pulse Scientific Inc**	☐ 1 ☒ 2 ☐ 2+ ☐ 3
Escherichia coli ATCC#8739	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**40mL**	**Pulse Scientific Inc**	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Escherichia coli ATCC #51813	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**40mL**	**Pulse Scientific Inc**	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Candida albicans (ATCC #10231)	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No	**40mL**	**Pulse Scientific Inc**	☒ 1 ☐ 2 ☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 2+ ☐ 3
	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No			☐ 1 ☐ 2 ☐ 2+ ☐ 3

ATCC - Level 1 (per website) ↑
PHAC - Level 2 (per MSDS)

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		Not applicable
Rodent	☐ Yes ☐ No		
Non-human primate	☐ Yes ☐ No		
Other (specify)	☐ Yes ☐ No		

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

Cell Type	Is this cell type used in your work?	Specific cell line(s)*	Containment Level of each cell line	Supplier / Source of cell line(s)
Human	☐ Yes ☐ No			
Rodent	☐ Yes ☐ No			
Non-human primate	☐ Yes ☐ No			
Other (specify)	☐ Yes ☐ No			

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

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

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		☐ Yes ☐ Unknown		☐1 ☐2 ☐2+ ☐3
Human Blood (fraction) or other Body Fluid		☐ Yes ☐ Unknown		☐1 ☐2 ☐2+ ☐3
Human Organs or Tissues (unpreserved)		☐ Yes ☐ Unknown		☐1 ☐2 ☐2+ ☐3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

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?

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

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

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

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 Animal Experiments

7.1 Will live animals be used? ☒ YES ☐ NO If **NO**, please proceed to section 8.0

7.2 Name of animal species to be used **Birds and Bats**

7.3 AUS protocol # **2010-216, 2010-020**

7.4 List the location(s) for the animal experimentation and housing. **AFAR and Field**

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

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

8.0 Use of Animal species with Zoonotic Hazards

8.1 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 9.0

8.2 Will live animals be used? ☒ YES ☐ NO

8.3 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 # **birds and bats** ☐ NO
- Birds ☒ YES, species **songbirds and shorebirds** ☐ NO
- Others (wild or domestic) ☒ YES, specify **bats** ☐ NO

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

9.0 Biological Toxins and Hormones

9.1 Will toxins or hormones of biological origin be used? ☒ YES ☐ NO If **NO**, please proceed to Section 10.0

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

9.3 What is the LD_{50} (specify species) of the toxin or hormone **unknown - see MSDS**

9.4 How much of the toxin or hormone is handled at one time*? **5mg**

9.5 How much of the toxin or hormone is stored*? **20mg**

9.6 Will any biological toxins or hormones be used in live animals? ☒ YES ☐ NO
If **YES**, Please provide details: **Birds are injected i.p. at 1mg/kg using a 0.25 mg/ml solution. This induces a transient sickness response (elevated body temperature, lethargy) which we measure.**

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

Additional Comments: _____

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
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

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

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 Christopher G. Guglielmo ***Date:*** December 21, 2011

14.0 Containment Levels

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

14.2 Has the facility been certified by OHS for this level of containment?
☒ YES, location and date of most recent biosafety inspection: **BGS 3012, AFAR 216**
☐ 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:
If there is an exposure the individual will be sent to University Health Services or other medical facility for assessment and treatment, and an accident report form will be filed. Individuals working with bats are rabies vaccinated and have up to date titre testing, but would still be sent for assessment. Other agents are low risk, but again assessment and treatment would occur.

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

An X in the check box indicates you agree with the above statement... ☒
Enter Your Name **Christopher G. Guglielmo** ***Date:*** **December 21, 2011**

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: _____
Date: _____

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

Special Conditions of Approval:

Subject: RE: Biological Agents Registry Form: Guglielmo
From: Christopher Guglielmo <cguglie2@uwo.ca>
Date: Tue, 24 Jan 2012 15:25:40 -0500
To: 'Jennifer Stanley' <jstanle2@uwo.ca>

New Info

Dear Jennifer,

Please do change the sections to S. aureus.

I contacted Pulse Scientific and they directed me to the Microbiologics website since they just distribute their products. The only MSDS they provide on their website is the one we sent. It is very general and uninformative, but I do not see one for that particular strain. I hope that can suffice.

Thanks, Chris

Christopher G. Guglielmo
Associate Professor
Department of Biology, Advanced Facility for Avian Research
University of Western Ontario
1151 Richmond St. N
London, ON N6A 5B7
Canada
Voice: 519-661-2111 X81204 or X84648 (AFAR)
Fax: 519-661-3935
http://www.birds.uwo.ca

From: Jennifer Stanley [mailto:jstanle2@uwo.ca]
Sent: January 24, 2012 2:29 PM
To: Christopher Guglielmo
Subject: Biological Agents Registry Form: Guglielmo

Hi there -

Your form was recently reviewed by the Biohazards Subcommittee. Here are the comments:

> In Section 1.2 it states that *Staphylococcus aureus* is zoonotic – thus it is a human and animal pathogen. (I can correct this on the form)
> The MSDS for *S. aureus* needs to be from the supplier (Pulse Scientific). Please send this by e-mail
> Regards
> Jennifer

-------- Original Message --------
Subject:RE: Re: Fwd: RE: Biological Agents Registry Form (Guglielmo) - EXPIRING SOON
Date: Tue, 10 Jan 2012 15:35:04 -0500
From: Christopher Guglielmo <cguglie2@uwo.ca>
To:'Jennifer Stanley' <jstanle2@uwo.ca>

E-mail

Dear Jennifer,

I have 2 students working with bats and they are rabies vaccinated and on record with Health Services (McGuire and Jonasson). I have filled in section 15.2 on the attached form. Please let me know if what I have entered is acceptable.

Yes, we should do another inspection. I am leaving tomorrow morning for a conference and will be back late Friday. Next week is pretty booked up, but could we do AFAR and BGS on Friday the 20th?

Thanks, Chris

Christopher G. Guglielmo
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Department of Biology, Advanced Facility for Avian Research
University of Western Ontario
1151 Richmond St. N
London, ON N6A 5B7
Canada
Voice: 519-661-2111 X81204 or X84648 (AFAR)
Fax: 519-661-3935
http://www.birds.uwo.ca

Staphylococcus aureus - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

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

SECTION II - HEALTH HAZARD

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

SECTION III - DISSEMINATION

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

SECTION IV - VIABILITY

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

SECTION V - MEDICAL

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

SECTION VI - LABORATORY HAZARDS

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

SECTION VII - RECOMMENDED PRECAUTIONS

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

SECTION VIII - HANDLING INFORMATION

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

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

Bacteria

ATCC® Number:	**8739™** Order this Item	Price:	**$155.00**

Organism:	*Escherichia coli* (Migula) Castellani and Chalmers
Designations:	Crooks
Isolation:	feces
Depositor:	IC Gunsalus
History:	ATCC <<--IC Gunsalus<<--G.C. Crooks
Biosafety Level:	1
Shipped:	freeze-dried
Growth Conditions:	ATCC medium3: Nutrient agar or nutrient broth **Temperature:** 37.0°C
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Cross References:	Escherichia coli C str. ATCC 8739 finished genomeJGI Project ID4002730 Nucleotide (GenBank) : CP000946Escherichia coli ATCC 8739, complete genome
Comments:	Genome sequenced strain
Applications:	assay of [92287] assay of antimicrobial preservatives [4101] [11020] [21514] [21603] bioresistance testing [92589] detection of [92381] [92805] [92834] efficacy testing [92779] media testing [11019] [21509] [21511] [21613] [92345] [92390] [92845] preparatory test control [21613] quality control strain [92096] testing [92304] [92305] [92307] [92349] [92403] testing antimicrobial handwashing formulations [32196] reduces dehydroascorbic acid [6118] quality control strain for Biosynth and Difco products
Related Products:	also available as SafeTsource™:ATCC 8739NA purified DNA: ATCC 8739D-5 also available as Certified Reference Material, ATCC CRM-8739

4101: ASTM International Standard Test Method for Preservatives in Water-Containing Cosmetics. West Conshohocken, PA

6118: J. Biol. Chem. 141: 853, 1941.

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Bacteria

ATCC® Number: **51813™** Order this Item Price: **$255.00**

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Organism:	*Escherichia coli* (Migula) Castellani and Chalmers
Designations:	DG1H9
Isolation:	food, Minnesota
Depositor:	3M Health Care
Biosafety Level:	1
Shipped:	freeze-dried
Growth Conditions:	ATCC medium3: Nutrient agar or nutrient broth **Temperature:** 37.0°C
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Comments:	Quality control of 3M products

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Fungi ,Yeasts and Yeast Genetic Stock

ATCC® Number:	**10231™** Order this Item	Price:	**$155.00**

Organism:	*Candida albicans* (Robin) Berkhout, anamorph
Designations:	3147 [CBS 6431, CCY 29-3-106, CIP 48.72, DSM 1386, IFO 1594, NCPF 3179, NCYC 1363, NIH 3147, VTT C-85161]
Isolation:	man with bronchomycosis
Depositors:	CW Emmons
History:	ATCC <<-- CW Emmons<<-- Wright
Biosafety Level:	1
Shipped:	freeze-dried
Growth Conditions:	ATCC medium 200: YM agar or YM broth **Temperature:** 25.0°C
Permits/Forms:	In addition to the MTA mentioned above, other ATCC and/or regulatory permits may be required for the transfer of this ATCC material. Anyone purchasing ATCC material is ultimately responsible for obtaining the permits. Please click here for information regarding the specific requirements for shipment to your location.
Antigenic Properties:	serotype A [19210]

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

Canada

Candida albicans - Material Safety Data Sheets (MSDS)

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: ***Candida albicans***

SYNONYM OR CROSS REFERENCE: Candidiasis, Thrush, Moniliasis

CHARACTERISTICS: Oval, budding yeast, produces pseudohyphae in culture and in tissues and exudates

SECTION II - HEALTH HAZARD

PATHOGENICITY: Mycosis of superficial layers of skin or mucous membranes (oral thrush, vulvovaginitis, paronychia, onychomycosis, intertrigo); ulcers or pseudomembranes in esophagus, gastrointestinal tract or bladder; hematogenous dissemination may produce lesions in kidney, spleen, lung, liver, prosthetic cardiac valve, eye, meninges, brain

EPIDEMIOLOGY: Worldwide

HOST RANGE: Humans

INFECTIOUS DOSE: Unknown

MODE OF TRANSMISSION: Endogenous spread (part of normal human flora); by contact with excretions of mouth, skin, and feces from patients or carriers; from mother to infant during childbirth; disseminated candidiasis may originate from mucosal lesions, unsterile narcotic injections, catheters

INCUBATION PERIOD: Variable

COMMUNICABILITY: Communicable for duration of lesions

SECTION III - DISSEMINATION

RESERVOIR: Humans (normal human flora)

ZOONOSIS: None

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: Sensitive to nystatin, clotrimazole, ketoconazole, fluconazole, amphotericin B for invasive candidiasis

DRUG RESISTANCE: Resistant strains have been described for all the above antifungal drugs

SUSCEPTIBILITY TO DISINFECTANTS: Sensitive to 1% sodium hypochlorite, 2% glutaraldehyde, formaldehyde; only moderately sensitive to 70% ethanol (phenolic may be substituted)

PHYSICAL INACTIVATION: Inactivated by moist heat (121°C for at least 15 min)

SURVIVAL OUTSIDE HOST: Survives outside of host, especially in moist, dark areas

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; microscopic demonstration of pseudohyphae and/or yeast cells in infected tissue or fluid; confirmation by culture

FIRST AID/TREATMENT: Administer antibiotic therapy as required

IMMUNIZATION: None

PROPHYLAXIS: None

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: 2 reported laboratory-acquired infections with *Candida*

SOURCES/SPECIMENS: Sputum, bronchial washings, stool, urine, mucosal surfaces, skin or wound exudates, CSF, blood

PRIMARY HAZARDS: Accidental parenteral inoculation, exposure of mucous membranes to droplets and aerosols, ingestion

SPECIAL HAZARDS: None

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for the manipulation of this organism

PROTECTIVE CLOTHING: Laboratory coat; gloves when contact with infectious materials is 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: November 1999

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

MSDS'

SIGMA-ALDRICH

Material Safety Data Sheet

Version 3.1
Revision Date 06/18/2009
Print Date 03/09/2010

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Lipopolysaccharides, from *Salmonella enterica* serotype typhimurium

Product Number : L7261
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. COMPOSITION/INFORMATION ON INGREDIENTS

CAS-No.	EC-No.	Index-No.	Concentration
Lipopolysaccharides Salmonella enterica serotype typhimurium			
-	-	-	-

3. HAZARDS IDENTIFICATION

Emergency Overview

Other hazards which do not result in classification
Pyrogen. May cause fever.

WHMIS Classification
Not WHMIS controlled. Not WHMIS controlled.

HMIS Classification
Health Hazard: 0
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.

4. FIRST AID MEASURES

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

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

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.

5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point	no data available
Ignition temperature	no data available

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
Avoid dust formation.

Environmental precautions
Do not let product enter drains.

Methods for cleaning up
Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Handling
Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

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
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. 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

Hygiene measures
General industrial hygiene practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	powder, lyophilized

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

Storage stability
Stable under recommended storage conditions.

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

11. TOXICOLOGICAL INFORMATION

Acute toxicity

no data available

Irritation and corrosion

no data available

Sensitisation

no data available

Chronic exposure

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.

Signs and Symptoms of Exposure

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

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.

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

no data available

Ecotoxicity effects

no data available

Further information on ecology

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)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

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

	CAS-No.
Lipopolysaccharides Salmonella enterica serotype typhimurium	-

WHMIS Classification
Not WHMIS controlled. Not WHMIS controlled.

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.

Microbiologics®

LYOPHILIZED MICROORGANISM PREPARATIONS

Section 1 – General Information

Product: Lyophilized microorganism preparations
Manufacturer: Microbiologics, Inc.
Telephone: 320-253-1640
Address: 217 Osseo Avenue North
St. Cloud, Minnesota 56303 USA

Section 2 – Composition

Each lyophilized, cylinder-shaped pellet contains a pure or mixed microorganism population. The microorganisms are classified as either Risk Group 1or Risk Group 2 by the World Health Organization (WHO). These microorganisms may cause human infection, may pose a hazard to laboratory personnel, but are unlikely to spread in the community. Exposure to these microorganisms in the laboratory rarely causes infection. Effective prevention and treatment is typically available.

Section 3 – Hazard Information

Physio-chemical: Not applicable
Health: Risk of infection
Environmental: Not applicable

Section 4 – First Aid Measures

Eyes: Avoid contact with eyes. If contact occurs, wash with plenty of water and seek medical attention immediately.
Skin: Non-irritant. If skin contact occurs, wash with an appropriate biocidal solution.
Inhalation: Avoid the production of aerosols. If inhalation occurs, move to an area of fresh air and seek medical advice.
Ingestion: Avoid hand to mouth contact. If ingested, seek medical advice.

Section 5 – Fire Fighting Measures

Not applicable

Section 6 – Accidental Release Measures

In case of accidental spillage, contain the spilled material and immediately notify nearby personnel of the incident. Decontaminate the spillage by flooding and soaking the spilled material with a suitable disinfectant. Allow sufficient time for the biocidal activity of the disinfectant according to the manufacturer's instructions for use. Clean the area and material using disposable paper towels or tissues. Towels and tissues containing microorganisms should be treated as biohazard material.

Section 7 – Handling and Storage

The lyophilized microorganism preparation must be stored at 2°- 8°C in the original sealed container. The lyophilized preparations contain viable microorganisms that may, under certain circumstances, produce disease. Proper techniques must be employed to avoid exposure and contact with microorganism growth. The microbiology laboratory must be equipped, and have the facilities to receive, process, maintain, store and dispose of biohazard material. The microbiology laboratory personnel using these devices must be trained, experienced and demonstrate proficiency in processing, maintaining, storing and disposing of biohazard material.

Section 8 – Exposure Control – Personal Protection

Good laboratory practices must be observed and followed at all times. The use of a biological safety cabinet, the prevention of aerosols and the use of gloves, moisture impervious aprons, and other protective clothing must be dictated by the standard operational procedures of each individual laboratory.

Section 9 – Physical and Chemical Properties

Inert, odorless and dry material.

Section 10 – Stability and Reactivity

When stored as directed, the lyophilized microorganism preparations are stable until the last day of the stated month of the expiration date. The length of storage does not affect the risk of infection.

Section 11 – Toxicology Information

Not applicable.

Section 12 – Ecological Information

Not applicable.

Section 13 - Disposal

The lyophilized materials, and subsequent growth of these microorganisms on culture media, are considered to be biohazard material. Agencies and statutes regulate the disposal of all biohazard materials. Each laboratory must be aware of, and comply with, the proper disposal of biohazard materials.

Section 14 – Transport Information

Refer to national and international regulations regarding the shipment and transport of biohazard materials. **UN Classification:** UN3373 Biological Substance, Category B and UN2814, Infectious Substances affecting humans for Microbiologics catalog numbers 0617 and 0730.

Section 15 – Regulatory Information

Not Listed.

Section 16 – Other Information

To the best of our knowledge, the information contained herein is accurate. Microbiologics Inc. assumes no liabilities for accuracy or completeness of the information contained herein.

The statements contained herein are offered for informational purposes only and are intended to be followed by persons having related technical skills and at their own discretion and risk. Since conditions and manner of use are outside of our control, we make no warranties, expressed or implied, and assume no liability in connection with any use of this information.

Western

TOXIN USE RISK ASSESSMENT

Name of Toxin:	Lipopolysaccharide
Proposed Use Dose:	5000 µg
Proposed Storage Dose:	20000 µg
LD $_{50}$ (species):	250000 µg

Calculation:

250000 µg/kg x 50 kg/person

Dose per person based on LD $_{50}$ in µg = 12500000

LD_{50} per person with safety factor of 10 based on LD_{50} in µg = 1250000

Comments/Recommendations: The LD50 used was for E. coli LPS.