THE UNIVERSITY OF WESTERN ONTARIO
BIOLOGICAL AGENTS REGISTRY FORM
Approved Biohazards Subcommittee: October 14, 2010
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).

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

PRINCIPAL INVESTIGATOR	Scott MacDougall-Shackleton
DEPARTMENT	Psychology
ADDRESS	AFAR room 200
PHONE NUMBER	ext 84629
EMERGENCY PHONE NUMBER(S)	519-639-1534
EMAIL	smacdou2@uwo.ca

Location of experimental work to be carried out: Building(s) ___AFAR_____ Room(s)__216 and others_

*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): _____
____Neural, behavioural, and physiological responses of birds to their environment____
_____

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

Name	UWO E-mail Address	Date of Biosafety Training
Haruka Wada	hwada@uwo.ca	Oct 11, 2010
Kimberly Schmidt	kschmi5@uwo.ca	Oct 11, 2010
Palle Kriengwatana	bkrieng@uwo.ca	Aug 27, 2008
Tara Farrell	tfarrel2@uwo.ca	Aug 27, 2008

Please explain the biological agents and/or biohazardous substances used and how they will be stored, used and disposed of. Projects without this description will not be reviewed.

My research is on songbirds, and takes place in the field and in the lab. Work is aimed at understanding how the physical and social environment affects development and seasonal changes in reproductive physiology.

The primary biological agents are the birds and their tissues (blood, brain tissue etc) that are handled in the field as well as in the lab. As well, we will conduct immune assays on avian plasma to determine microbicidal properties of avian blood.

Avian Tissues

In the lab and the field we routinely collect blood samples and brain samples for hormone assays and histological analysis. There is a risk of zoonotic disease, but this risk is low. The primary concern here would be west Nile virus, but this risk is low for several reasons. First, birds with west Nile are sick or dying and unlikely to be caught by us. Second, infection is via blood-blood transfer, which is easily controlled.

In the field, researchers use sanitizers after handling birds. Processing of blood samples or other tissue is performed wearing gloves. This work is generally considered Biohazard Level 1.

Microbicidal Assays

Microbicidal assays are conducted in the biosafety cabinet located in room 216 AFAR building. There is an autoclave in this room, so all procedures can be conducted within the same room.

Whole blood samples are mixed with known dilution of microorganism within CO2 independent media, then incubated, plated, and incubated again overnight. We use standard low-pathogenic strains of microbes (E. Coli and C. albicans) that have been used in other studies in order to relate immune functioning in our work to prior research. The differential capacity of the blood to kill microorganisms is assessed as the reduced growth of colonies on the plates relative to controls. Following the colony counts the samples are autoclaved and disposed.

216 AFAR is a Level 2 lab -JS

Please include a one page research summary or teaching protocol.

My research consists of two interrelated lines of inquiry aimed at understanding the cognitive, neural and endocrine mechanisms that underlie avian reproductive behaviour. (1) The first line of research will address the extent to which birdsong and other cognitive abilities in songbirds are affected by stress during development. Because males learn song early in life and use song to attract mates, birdsong is a classic example of a sexually selected cognitive trait. The Developmental Stress Hypothesis posits that song can act as an honest signal to females, because only high quality males can buffer themselves from environmental stressors during early life to develop their brain and learn high quality songs. I will test several predictions of this hypothesis in the field and the lab, using correlational and experimental approaches. Questions to be addressed include: Is song repertoire size correlated to other indicators of developmental stress? Does experimental manipulation of stress in early development also affect these parameters and song? Does early stress affect neural and cognitive systems other than the song control system and song, such as spatial memory or general cognitive flexibility? How does early stress affect female song perception and ability to make good mate choice decisions? (2) The second line of research will address how songbirds use photoperiod and other social and environmental cues to time reproduction. Species vary in how strongly they rely on day length versus other cues (e.g., temperature, presence of a mate) to time reproduction, and this may affect how flexibly they can respond to global change. This ongoing research compares different songbird species to understand how flexibility in reproductive timing is related to flexibility in response to photoperiod and other cues. Combined, these two lines of research will provide an integrative framework for understanding the cognitive, neural and endocrine mechanisms underlying reproduction in birds.

1.0 Microorganisms

1.1 Does your work involve the use of biological agents? **X** YES O 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? O YES **X** NO
If YES, please give the name of the species. _____
What is the origin of the microorganism(s)? ____VWR_____
Please describe the risk (if any) of escape and how this will be mitigated: ____Shipped and stored freeze-dried and reconstituted immediately before use. After use, waste will be autoclaved._____
____All use will be in biosafety /post-mortem room 216 at AFAR and conducted in a biosafety cabinet. The autoclave is within the same room_____
Please attach the CFIA permit.
Please describe any CFIA permit conditions:
_____
_____
_____

C. albicans
ATCC Level 1
PHAC Level 2 (MSDS)

1.2 Please complete the table below:

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
Candida albicans (ATCC #10231)	☐ Yes X No	☐ Yes X No	☐ Yes X No	0.1	VWR	X 1 ☐ 2 ☐ 2+ ☐ 3
Escherichia coli (ATCC# 8739)	☐ Yes X No	☐ Yes X No	☐ Yes X No			X 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.

2.0 Cell Culture

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

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

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

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

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

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

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

3.0 Use of Human Source Materials

3.1 Does your work involve the use of human source materials? YES X 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		O 1 O 2 2+ O 3
Human Blood (fraction) or other Body Fluid		Yes Unknown		O 1 O 2 2+ O 3
Human Organs or Tissues (unpreserved)		Yes Unknown		O 1 O 2 2+ O 3
Human Organs or Tissues (preserved)		Not Applicable		Not Applicable

4.0 Genetically Modified Organisms and Cell lines

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

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

Bacteria Used for Cloning *	Plasmid(s) **	Source of Plasmid	Gene Transfected	Describe the change that results from transformation or tranfection

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

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

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

* Please attach a Material Safety Data Sheet or equivalent.

4.4 Will genetic sequences from the following be involved?

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

4.5 Will virus be replication defective? YES NO

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

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

5.0 Human Gene Therapy Trials

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

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

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

5.3 How will the biological agent be administered? _____

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

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

6.0 Animal Experiments

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

6.2 Name of animal species to be used___songbirds (various species)_____

6.3 AUS protocol # ____2007-089_____

6.4 Will any of the agents listed in section 4.0 be used in live animals YES, specify: _____ X NO

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

_____

_____

7.0 Use of Animal species with Zoonotic Hazards

7.1 Will any animals with zoonotic hazards or their organs, tissues, lavages or other body fluids including blood be used (see list below)? X YES No If no, please proceed to section 8.0

7.2 Will live animals be used? X YES No

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

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

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

_____

8.0 Biological Toxins

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

8.2 If YES, please name the toxin(s)_____
Please attach information, such as a Material Safety Data Sheet, for the toxin(s) used.

8.3 What is the LD_{50} (specify species) of the toxin_____

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

8.5 How much of the toxin is stored*? _____

8.6 Will any biological toxins be used in live animals? YES, Please provide details:_____ NO

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

9.0 Insects

9.1 Do you use insects? YES X NO If no, please proceed to Section 10.0

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

9.3 What is the origin of the insect? _____

9.4 What is the life stage of the insect? _____

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

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

_____
_____

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

_____

_____

10.0 Plants

10.1 Do you use plants? ☐ YES X NO If no, please proceed to Section 11.0

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

10.3 What is the origin of the plant? _____

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

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

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

_____

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

_____

_____

_____

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

_____

_____

11.0 Import Requirements

11.1 Will any of the above agents be imported? ☐ YES, please give country of origin_____ X NO
If no, please proceed to Section 12.0

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

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

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

12.0 Training Requirements for Personnel Named on Form

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

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

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

SIGNATURE  _____

13.0 Containment Levels

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

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

X YES, date of most recent biosafety inspection: ___2010_____

☐ NO, please certify

☐ NOT REQUIRED for Level 1 containment

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

14.0 Procedures to be Followed

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

_____No additional risk reduction measures required beyond standard protocol._____

_____

_____

14.2 Please outline what will be done if there is an exposure to the biological agents listed, such as a needlestick injury or an accidental splash:

_____Immediately disinfect contaminated areas. In the event of a needlestick first aid will be conducted immediately and student or staff will consult health services._____

_____

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

SIGNATURE ____ _____ Date:_____31 July 2011_____

15.0 Approvals

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

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

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

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

Special Conditions of Approval:

-------- Original Message --------
Subject: Re: Biological Agents Registry Form: MacDougall-Shackleton
Date: Mon, 01 Aug 2011 20:59:42 -0400
From: Scott A. MacDougall-Shackleton <smacdou2@uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>

Dear Jennifer,
I have added the following statement:
We use standard low-pathogenic strains of microbes (E. Coli and C. albicans) that have been used in other studies in order to relate immune functioning in our work to prior research

I have also amended 14.1 and 14.2.

Please let me know if you need copies of the MSDS again or if the ones I sent originally suffice.

Thanks, Scott

New Info

Fungi ,Yeasts and Yeast Genetic Stock
ATCC® Number: **10231™**

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]

Applications:

assay of amphotericin B fungizone [58605] assay of antimicrobial preservatives [11020] [21514] [21603] assay of haloprogin [58605] assay of nystatin fungicidin [58605] detection of [92841] media testing [21613] [11019] [92390] [92845] [92428] [21569] [11018] [21509] [21529] membrane filter testing [92565] preparatory test control [21613] produces D-arabinolactone oxidase [20456] produces DNA topoisomerase [17682] produces aspartic proteinases aspartyl proteinases [20538] produces estrogen-binding protein [1694] produces lanosterol synthase 2,3-oxidosqualene lanosterol cyclase [20455] produces phenethyl alcohol [594] produces polyamine oxidase [57063] [54167] produces tryptophol [594] quality control strain [92096] [92144] [92409] sterility testing [21604] [58442] [92306] [92277] testing [92402] [92307] [92305] [92403] testing fungicides [92789] [92802] [92837] [92824] [92831] [92784] [92836] [92443] produces farnesoic acid, an autoregulatory substance capable of regulating morphological transition [53041]

Comments:

This strain is recommended by ATCC for use in the tests described in ASTM Standard Test Method E979-91 where only the taxon is specified. For sterility testing, not more than five passages from the ATCC culture should be used. Growth and invasiveness in mouse [19748] Steroid interference with antifungal activity [19749] Cell wall hydrophobicity enhances corticosterone incorporation. [20319] Ultraviolet microscopy [20321] Calcification [20476] Morphology and physiology of strain sectors [20157] Use of impedance for preservative efficacy testing [1968] Fungitoxicity of alcohols and fatty acids [16096] Esterase activity [19297] Lipid composition [20072] Effect of antineoplastic drugs [19796]

Related Products: genomic DNA: ATCC 10231D-5

Subcollection: Yeasts

References:

594: Lingappa BT, et al. Phenethyl alcohol and tryptophol: autoantibiotics produced by the fungus Candida albicans. Science 163: 192-194, 1969. PubMed: 5762768

1694: Skowronski R, Feldman D. Characterization of an estrogen-binding protein in the yeast Candida albicans. Endocrinology 124: 1965-1972, 1989. PubMed: 2647470

1968: Connolly P, et al. The use of impedance for preservative efficacy testing of pharmaceuticals and cosmetic products. J. Appl. Bacteriol. 76:

68-74, 1994. PubMed: 8144407
2024: Klig LS, et al. Comparison of INO1 gene sequences and products in Candida albicans and Saccharomyces cerevisiae. Yeast 10: 789-800, 1994. PubMed: 7975896
4101: ASTM International Standard Test Method for Preservatives in Water-Containing Cosmetics. West Conshohocken, PA
11018: British Pharmacopoeia Commission Test for sterility. London, UK:British Pharmacopoeia Commission;British Pharmacopoeia Appendix XVI A, 2003
11019: British Pharmacopoeia Commission Tests for microbial contamination. London, UK:British Pharmacopoeia Commission;British Pharmacopoeia Appendix XVI B, 2003
11020: British Pharmacopoeia Commission Efficacy of antimicrobial preservation. London, UK:British Pharmacopoeia Commission;British Pharmacopoeia Appendix XVI C, 2003
16096: Gershon H, Shanks L. Antifungal properties of n-alkanols, alpha, omega-n-alkanediols, and omega-chloro-alpha-alkanols. J. Pharm. Sci. 69: 381-384, 1980. PubMed: 7373528
17682: Shen LL, et al. DNA topoisomerases from pathogenic fungi: targets for the discovery of antifungal drugs. Antimicrob. Agents Chemother. 36: 2778-2784, 1992. PubMed: 1336349
19210: Wagner T, et al. pH-dependent denaturation of extracellular aspartic proteinases from Candida species. J. Med. Vet. Mycol. 33: 275-278, 1995. PubMed: 8531028
19297: Rudek W. Esterase activity in Candida species. J. Clin. Microbiol. 8: 756-759, 1978. PubMed: 370150
19748: Phillips AW, Balish E. Growth and invasiveness of Candida albicans in the germ-free and conventional mouse after oral challenge. Appl. Microbiol. 14: 737-741, 1966. PubMed: 5970461
19749: Zygmunt WA, Tavormina PA. Steroid interference with antifungal activity of polyene antibiotics. Appl. Microbiol. 14: 865-869, 1966.
19796: Ghannoum MA, Al-Khars A. Effect of antineoplastic agents on the growth and ultrastructure of Candida albicans. Mykosen 27: 452-464, 1984. PubMed: 6438503
20072: . . Dev. Ind. Microbiol. 21: 373-378, 1980.
20157: Saltarelli CG. Morphological and physiological variations between sectors isolated from giant colonies of Candida albicans and C. stellatoidea. Mycopathol. Mycol. Appl. 34: 209-220, 1968.
20319: Braun PC. Surface hydrophobicity enhances corticosterone incorporation in Candida albicans. Infect. Immun. 62: 4087-4090, 1994. PubMed: 8063431
20321: Balish E, Svihla G. Ultraviolet microscopy of Candida albicans. J. Bacteriol. 92: 1812-1820, 1966. PubMed: 5958110
20455: Balliano G, et al. Inhibition of sterol biosynthesis in Saccharomyces cerevisiae and Candida albicans by 22,23-epoxy-2-aza-2,3-dihydrosqualene and the corresponding N-oxide. Antimicrob. Agents Chemother. 38: 1904-1908, 1994. PubMed: 7810997
20456: Huh WK, et al. Characterisation of D-arabinono-1,4-lactone oxidase from Candida albicans ATCC 10231. Eur. J. Biochem. 225: 1073-1079, 1994. PubMed: 7957197
20476: Ennever J, Summers FE. Calcification by Candida albicans. J. Bacteriol. 122: 1391-1393, 1975. PubMed: 238948
20538: Lerner CG, Goldman RC. Stimuli that induce production of Candida albicans extracellular aspartyl proteinase. J. Gen. Microbiol. 139: 1643-1651, 1993. PubMed: 7690395
21509: European Pharmacopoeia Commission Microbial contamination of products not required to comply with the test for sterility (total viable aerobic count). Strasbourg, France:European Pharmacopoeia Commission;European Pharmacopoeia EP 2.6.12, 1997
21514: European Pharmacopoeia Commission Efficacy of antimicrobial preservation. Strasbourg, France:European Pharmacopoeia Commission;European Pharmacopoeia EP 5.1.3, 1997
21529: CLSI Quality Control for Commercially Prepared Microbiological Culture Media; Approved Standard - 3rd Edition. Wayne, PA:Clinical and Laboratory Standards Institute;CLSI M22-A3.
21569: US Food & Drug Administration. GENERAL BIOLOGICAL PRODUCTS STANDARDS; General Provisions; Sterility Code of Federal Regulations Title 21: 21CFR610.12, Subpart B, 2005
21603: U.S. Pharmacopeia General Chapters:<51> ANTIMICROBIAL EFFECTIVENESS TESTING. Rockville, MD:U.S. Pharmacopeia;USP USP28-NF23, 2005
21604: U.S. Pharmacopeia General Chapters: <71> STERILITY TESTS. Rockville, MD:U.S. Pharmacopeia;USP USP28-NF23, 2005
21613: U.S. Pharmacopeia Dietary Supplement Chapters: <2021> MICROBIAL ENUMERATION TESTS-NUTRITIONAL AND DIETARY SUPPLEMENTS . Rockville, MD:U.S. Pharmacopeia;USP USP28-NF23, 2005
40135: Kondoh O, et al. Cloning of the RHO1 gene from Candida albicans and its regulation of beta-1,3-glucan synthesis. J. Bacteriol. 179: 7734-7741, 1997. PubMed: 9401032
43501: Huh WK, Kang SO. Molecular cloning and functional expression of alternative oxidase from Candida albicans. J. Bacteriol. 181: 4098-4102, 1999. PubMed: 10383980
53041: Oh KB, et al. Purification and characterization of an autoregulatory substance capable of regulating the morphological transition in Candida albicans. Proc. Natl. Acad. Sci. USA 98: 4664-4668, 2001. PubMed: 11274356
54167: et al., Isobe K. Differential determination procedure for putrescine, spermidine and spermine with polyamine oxidase from fungi and putrescine oxidase. Agric. Biol. Chem. 45: 727-733, 1981.
57063: et al., Yamada H. Oxidation of polyamines by fungal enzymes. Agric. Biol. Chem. 44: 2469-2476, 1980.
58442: Bowman FW, et al. Collaborative study of aerobic media for sterility testing by membrane filtration. J. Pharm. Sci. 60: 1087-1088, 1971. PubMed: 5000479
58605: Harrison EF, Zygmunt WA. Haloprogin: Mode of action studies in Candida albicans. Can. J. Microbiol. 20: 1241-1245, 1974. PubMed: 4608935
92096: Applied Biosystems MicroSeq Pharmaceutical Panel #1. :Applied Biosystems;MicroSeq
92144: Biolog YT MicroPlate. :Biolog;Biolog
92277: Supplemental assay method for testing for preservative interference with sterility tests. :US Department of Agriculture;USDA, Center for Veterinary Biologics STSAM0903.01, 1999
92287: Efficacy of Preservation on Non-Eye Area Water-Miscible Cosmetic and Toiletry Formulations. Gaithersburg, MD:AOAC International;AOAC "Official Methods of Analysis of the AOAC International" 998.10.
92305: Microbial limit test for crude drugs. Tokyo, Japan:Japanese Pharmacopoeia;JP JP14e.part I.36.
92306: Sterility test, Growth promotion test. Tokyo, Japan:Japanese Pharmacopoeia;JP JP14e.part I.54.
92307: Preservatives-effectiveness test. Tokyo, Japan:Japanese Pharmacopoeia;JP JP14e.part II.12.
92390: Microbiology of food and animal feeding stuffs--Guidelines on preparation and production of culture media-- Part 2: Practical guidelines on performance testing of culture media.. Geneva (Switzerland):International Organization for Standardization/ANSI;ISO ISO 11133-2:2003.

92402: Ophthalmic optics--Contact lens care products--Microbiological requirements and test methods for products and regimens for hygienic management of contact lenses. Geneva (Switzerland):International Organization for Standardization/ANSI;ISO ISO 14729:2001.
92403: Ophthalmic optics--Contact lens care products--Antimicrobial preservative efficacy testing and guidance on determining discard date. Geneva (Switzerland):International Organization for Standardization/ANSI;ISO ISO 14730:2000.
92409: Applied Biosystems MicroSeq PHL Panel #1. :Applied Biosystems;MicroSeq
92428: Medical microbiology -- Culture media -- Part 2: Ready-to-use blood culture systems. Berlin, Germany:Deutsches Institut für Normung;DIN DIN 58942-2: 2004, 2004
92443: Chemical disinfectants and antiseptics -- Quantitative suspension test for the evaluation of fungicidal activity of chemical disinfectants and antiseptics used in food, industrial, domestic and institutional areas -- Test method and requirements (phase 2, step 1). London, UK:British Standards Institution;British Standard BS EN 1650:1998.
92565: Standard Test Method for Confirming the Sterility of Membrane Filters. West Conshohocken, PA:ASTM International;ASTM Standard Test Method D 4196-05.
92575: Standard Test Method for Efficacy of Fungal Control Agents as Preservatives for Aqueous-Based Products Used in the Paper Industry. West Conshohocken, PA:ASTM International;ASTM Standard Test Method E 0875-00 (Reapproved 2005).
92784: Chemical disinfectants and antiseptics - Preservation of test organisms used for the determination of bactericidal, sporicidal and fungicidal activity. London, UK:British Standards Institution;British Standard BS EN 12353:2006.
92789: Chemical disinfectants and antiseptics --- Quantitative non-porous surface test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas --- Test method and requirements without mechanical action (phase 2/step 2). London, UK:British Standards Institution;British Standard BS EN 13697:2001.
92802: Chemical disinfectants and antiseptics --- Quantitative suspension test for the evaluation of fungicidal activity of chemical disinfectants for instruments used in the medical area --- Test method and requirements (phase 2, step 1). London, UK:British Standards Institution;British Standard BS EN 13624:2003.
92824: Chemical disinfectants and antiseptics --- Quantitative suspension test for the evaluation of basic fungicidal or basic yeasticidal activity of chemical disinfectants and antiseptics --- Test method and requirements (phase 1). London, UK:British Standards Institution;British Standard BS EN 1275:2005.
92831: Chemical disinfectants and antiseptics --- Quantitative carrier test for the evaluation of fungicidal or yeasticidal activity for instruments used in the medical area --- Test method and requirements (phase 2, step 2). London, UK:British Standards Institution;British Standard BS EN 14562:2006.
92836: Chemical disinfectants and antiseptics --- Quantitative suspension test for the evaluation of fungicidal or yeasticidal activity of chemical disinfectants and antiseptics used in the veterinary area --- Test method and requirements (phase 2, step 1). London, UK:British Standards Institution;British Standard BS EN 1657:2005.
92837: Chemical disinfectants and antiseptics --- Application of European Standards for chemical disinfectants and antiseptics. London, UK:British Standards Institution;British Standard BS EN 14885:2006.
92841: Cosmetics --- Microbiology --- Enumeration of yeast and mould. London, UK:British Standards Institution;British Standard Draft ISO 16212:2007.
92845: Microbiology of food and animal feeding stuffs --- Guidelines on preparation and production of culture media --- Part 2: Practical guidelines on performance testing of culture media - Annex B: Recommended test microorganisms for commonly used culture media. London, UK:British Standards Institution;British Standard DD CEN ISO/TS 11133:2003.

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

Bacteria
ATCC® Number: 8739™

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) : CP000946 Escherichia 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

References:

4101: ASTM International Standard Test Method for Preservatives in Water-Containing Cosmetics, West Conshohocken, PA 6118: J. Biol. Chem. 141: 853, 1941.
11019: British Pharmacopoeia Commission Tests for microbial contamination. London, UK:British Pharmacopoeia Commission;British Pharmacopoeia Appendix XVI B, 2003
11020: British Pharmacopoeia Commission Efficacy of antimicrobial preservation. London, UK:British Pharmacopoeia Commission;British Pharmacopoeia Appendix XVI C, 2003
21509: European Pharmacopoeia Commission Microbial contamination of products not required to comply with the test for sterility (total viable aerobic count). Strasbourg, France:European Pharmacopoeia Commission;European Pharmacopoeia EP 2.6.12, 1997
21511: European Pharmacopoeia Commission Microbial contamination of products not required to comply with the test for sterility (tests for specified micro-organisms). Nutritive and selective properties of the media and validity of the test for specified micro-organisms. Strasbourg, France:European Pharmacopoeia Commission;European Pharmacopoeia EP 2.6.13, 1997
21514: European Pharmacopoeia Commission Efficacy of antimicrobial preservation. Strasbourg, France:European Pharmacopoeia Commission;European Pharmacopoeia EP 5.1.3, 1997
21603: U.S. Pharmacopeia General Chapters:<51> ANTIMICROBIAL EFFECTIVENESS TESTING Rockville, MD:U.S. Pharmacopeia;USP USP28-NF23, 2005
21613: U.S. Pharmacopeia Dietary Supplement Chapters: <2021> MICROBIAL ENUMERATION TESTS-NUTRITIONAL AND DIETARY SUPPLEMENTS . Rockville, MD:U.S. Pharmacopeia;USP USP28-NF23, 2005
32185: Jones CB, Platt JH. Propofol composition containing edetate. US Patent 5,714,520 dated Feb 3 1998
32196: Fendler EJ, et al. Antimicrobial cleansing composition containing chlorhexidine, an amphoteric surfactant, and an alkyl polyglucoside.

US Patent 5,719,113 dated Feb 17 1998
92096: Applied Biosystems MicroSeq Pharmaceutical Panel #1. :Applied Biosystems;MicroSeq
92287: Efficacy of Preservation on Non-Eye Area Water-Miscible Cosmetic and Toiletry Formaulations. Gaithersburg, MD:AOAC International;AOAC "Official Methods of Analysis of the AOAC International" 998.10.
92304: Microbial limit test. Tokyo, Japan:Japanese Pharmacopoeia;JP Jp14e.part I.35.
92305: Microbial limit test for crude drugs. Tokyo, Japan:Japanese Pharmacopoeia;JP JP14e.part I.36.
92307: Preservatives-effectiveness test. Tokyo, Japan:Japanese Pharmacopoeia;JP JP14e.part II.12.
92345: Food microbiology. Method 12.3: Microbiology of food and animal feeding stuffs -- Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococus aureus and other species)--Detection and MPN technique for low numbers. Sydney, NSW, Australia:Standards Australia;Standards Australia AS 5013.12.3:2004.
92349: Antimicrobial products - Test for antimicrobial activity and efficacy. Tokyo, Japan:Japanese Standards Association;JIS Z 2801, 2000
92381: Microbiology of food and animal feeding stuffs-- Horizontal method for the enumeration of coagulase-positive staphylococci (Staphylococcus aureus and other species)--Part3: Detection and MPN technique for low numbers. Geneva (Switzerland):International Organization for Standardization/ANSI;ISO ISO 6888-3:2003.
92390: Microbiology of food and animal feeding stuffs--Guidelines on preparation and production of culture media-- Part 2: Practical guidelines on performance testing of culture media.. Geneva (Switzerland):International Organization for Standardization/ANSI;ISO ISO 11133-2:2003.
92403: Ophthalmic optics--Contact lens care products--Antimicrobial preservative efficacy testing and guidance on determining discard date. Geneva (Switzerland):International Organization for Standardization/ANSI;ISO ISO 14730:2000.
92589: Standard Practice for Evaluating Water-Miscible Metalworking Fluid Bioresistance and Antimicrobial Pesticide. West Conshohocken, PA:ASTM International;ASTM Standard Test Method E 2275-03E01.
92779: Cosmetics - Microbiology - Enumeration and detection of aerobic mesophilic bacteria. London, UK:British Standards Institution;British Standard BS ISO 21149:2006.
92805: Cosmetics --- Microbiology --- Detection of Escherichia coli. London, UK:British Standards Institution;British Standard BS ISO 21150:2006.
92834: Microbiology of food and animal feeding stuffs --- Horizontal method for the determination of low numbers of presumptive Bacillus cereus --- Most probable number technique and detection method. London, UK:British Standards Institution;British Standard BS EN ISO 21871:2006.
92845: Microbiology of food and animal feeding stuffs --- Guidelines on preparation and production of culture media --- Part 2: Practical guidelines on performance testing of culture media - Annex B: Recommended test microorganisms for commonly used culture media. London, UK:British Standards Institution;British Standard DD CEN ISO/TS 11133:2003.

Candida albicans
Permits/Forms
ATCC Number: 10231
Country: Canada

- No additional permits and/or forms are required.

Choose the ultimate destination from the drop down box below for a list of the specific requirements. If your ultimate destination is not listed then ATCC does not currently ship to your country. **Information about permits is provided as a courtesy to ATCC customers.** While we use reasonable efforts to include accurate and up-to-date information on this page, we make no warranties or representation as to its accuracy.

Escherchia coli
Permits/Forms
ATCC Number: 51813
Country: Canada

- No addition

Not used - see e-mail

Choose the ultimate ... he specific requirements. If your ultimate desti... your country. **Information about permits is p...** se reasonable efforts to include accurate an... ...page, we make no warranties or representation as to its accuracy.

Escherchia coli
Permits/Forms
ATCC Number: 8739
Country: Canada

- No additional permits and/or forms are required.

Choose the ultimate destination from the drop down box below for a list of the specific requirements. If your ultimate destination is not listed then ATCC does not currently ship to your country. **Information about permits is provided as a courtesy to ATCC customers.** While we use reasonable efforts to include accurate and up-to-date information on this page, we make no warranties or representation as to its accuracy.

http://www.atcc.org/

------- Original Message --------
Subject: Re: Biological Agents Registry Form (MacDougall-Shackleton) - expired
Date: Thu, 05 May 2011 06:43:42 -0700
From: Scott MacDougall-Shackleton <smacdou2@uwo.ca>
To: Jennifer Stanley <jstanle2@uwo.ca>

Whoops, sorry
I copied those ATCC from another file.
We will only be using 8739 and C. albicans.

Thanks! Scott