

The University of Western Ontario
BIOLOGICAL AGENTS REGISTRY FORM
 Approved Biohazards Subcommittee: July 8, 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:	Amarjeet Bassi
DEPARTMENT:	Chemical and Biochemical Engineering
ADDRESS:	TEB 14 Faculty of Engineering
PHONE NUMBER:	88324
EMERGENCY PHONE NUMBER(S):	519 860 1494
EMAIL:	abassi@uwo.ca

Location of experimental work to be carried out :

Building :	TEB	Room(s):	14
Building :	TEB	Room(s):	313
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): **Discovery, NSERC Strategic Project**

UNDERGRADUATE COURSE NAME(IF APPLICABLE):

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

<u>Name</u>	<u>UWO E-mail Address</u>	<u>Date of Biosafety Training</u>
Priyanka Saxena	psaxena@uwo.ca	To be done
Claudia Sacasa	csacasac@uwo.ca	To be redone
Harpreet Kaur	hkaur22@uwo.ca	2009
Gureet Chandok	gchandho@uwo.ca	May 10, 2011
Ana Maria Aguirre	aaguirre@uwo.ca	15-Oct-2010
Ahmed Alasuity	alassui@uwo.ca	to be redone

Microalgae (*Chlorella vulgaris* UTEX 2714) are grown in liquid media for production of lipids under controlled conditions. Cultures are performed in sealed flasks to avoid any kind of contamination. Once experiments are done, microalgae cultures are sterilized in autoclave at 120C for 15 minutes. This ensures all the microalgae are dead, the sterile cultures are discarded through the sink.

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

Beneficial production of valuable products Part of the project with *Chlorella vulgaris* UTEX 2714 aims to explore the effect of physical and biochemical treatments on cell wall disruption for lipid extraction. The research focuses on studying the effect of changes in some culture conditions on lipid production and cell wall composition, and the subsequent treatment of microalgae biomass with steam explosion and enzymatic hydrolysis for lipid releasing (the later part has not been started yet). Other part of the project with this strain focuses only on ideal growth conditions for this strain of *Chlorella* in a tubular photobioreactor .

Use of wastewater as nutrient source for cultivation of microalgae : Effluents from 2 different sources were tested as a nutrient source for pilot scale cultivation of microalgae. Microalgae not only purify the waste water but also serve as a excellent source for vitamins, proteins and natural coloring agents.

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)? **Chlorella vulgaris 2714, Dunaliella Salina UTEX 200 and UTEX 1644 from UTEX collection.**

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

Non pathogenic

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
Chlorella vulgaris UTEX 2714	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No		UTEX	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Dunaliella Salina UTEX 200 and UTEX 1644	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No		UTEX	☒ 1 ☐ 2 ☐ 2+ ☐ 3
Escherichia coli BL21	☐ Yes ☒ No	☐ Yes ☒ No	☐ Yes ☒ No		Novagen	☒ 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		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 6.0

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 7.0

7.2 Name of animal species to be used

7.3 AUS protocol #

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

7.5 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 8.0

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 # | ☐ NO |
| ◆ Birds | ☐ YES, species | ☐ NO |
| ◆ Others (wild or domestic) | ☐ YES, specify | ☐ 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 9.0

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

9.3 What is the LD₅₀ (specify species) of the toxin or hormone

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

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

9.6 Will any biological toxins or hormones be used in live animals? ☐ YES ☐ NO
If YES, Please provide details:

*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 10.0

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 11.0
- 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 12.0
- 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 Amarjeet Bassi **Date:** Sept 2, 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:

☐ NO, please certify

☒ NOT REQUIRED for Level 1 containment

**Level 1 permit:
B10-UWO-0076**

14.3 Please indicate permit number (not applicable for fir

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:

Through washing with soap and water, Use of disinfectant on surfaces.

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/newposition.htm>

An X in the check box indicates you agree with the above statement... ☒

Enter Your Name Amarjeet Bassi **Date:** September 2, 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:



Canadian Food Inspection Agency
Agence canadienne d'inspection des aliments



Office of Biohazard Containment and Safety
Science Branch, CFIA
59 Camelot Drive, Ottawa, Ontario K1A 0Y9
Tel: (613) 221-7068 Fax: (613) 228-6129
Email: ImportZoopath@inspection.gc.ca

Bureau du confinement des biorisques et sécurité
Direction générale des sciences, ACIA
59 promenade Camelot, Ottawa, Ontario K1A 0Y9
Tél: (613) 221-7068 Téléc: (613) 228-6129
Courriel: ImportZoopath@inspection.gc.ca

October 20th, 2009

Ms. Shamila Survery / Mr. Michael Decosimo
Cedarlane Laboratories Ltd
4410 Paletta Court
Burlington, Ontario L7L 5R2

By Facsimile: (289) 288-0020

SUBJECT: Importation of *Escherichia coli* strains

Dear Ms. Survery / Mr. Decosimo:

Our office received your query about the importation of *Escherichia coli* from the American Type Culture Collection (ATCC) located in Manassas, Virginia, United States. The following *Escherichia coli* strains are considered to be level 1 animal pathogens:

• 5K	• CIE85	• J52	• MC4100 (MuLac)	• U5/41
• 58	• DH1	• J53	• MG1655	• W208
• 58-161	• DH10 GOLD	• JC3272	• MM294	• W945
• 679	• DH10B	• JC7661	• MS101	• W1485
• 1532	• DH5	• JC9387	• NC-7	• W3104
• AB284	• DH5-alpha	• JF1504	• Nissle 1917	• W3110
• AB311	• DP50	• JF1508	• One Shot STBL3	• WA704
• AB1157	• DY145	• JF1509	• OP50	• WP2
• AB1206	• DY380	• JJ055	• P678	• X1854
• AG1	• E11	• JM83	• PA309	• X2160T
• B	• EJ183	• JM101	• PK-5	• X2541
• BB4	• EL250	• JM109	• PMC103	• X2547T
• BD792	• EMG2	• K12	• PR13	• XL1-BLUE
• BL21	• EPI 300	• KC8	• Rri	• XL1-BLUE-MRF
• BL21 (DE3)	• EZ10	• KA802	• RV308	• XL0LR
• BM25.8	• FDA Seattle 1946	• KAM32	• S17-1λ -PIR	• Y10
• C	• Fusion-Blue	• KAM33	• SCS1	• Y1090 (1090)
• C-1a	• H1443	• KAM43	• SMR10	• YN2980
• C-3000	• HF4714	• LE450	• SOLR	• W3110
• C25	• HB101	• LE451	• SuperchargeEZ10	• WG1
• C41 (DE3)	• HS(PFAMP)R	• LE452	• SURE	• WG439
• C43 (DE3)	• Hfr3000	• MB408	• TOP10	• WG443
• C600	• Hfr3000 X74	• MBX1928	• TG1	• WG445
• Cavalli Hfr	• HMS174	• MC1061		

The Office of Biohazard Containment and Safety (BCS) of the Canadian Food Inspection Agency (CFIA) only issues import permits for microorganisms that are pathogenic to animals, or parts of microorganisms that are pathogenic to animals. As the products listed above are not considered pathogenic to animals, the Office of BCS does not have any regulatory requirements for their importation.

Please note that other legislation may apply. You may wish to contact the Public Health Agency of Canada's (PHAC) Office of Laboratory Security at (613) 957-1779.

Note: Microorganisms pathogenic to animals and veterinary biologics require an import permit from the CFIA.

Sincerely,

Cinthia Labrie
Head, Animal Pathogen Importation Program
Office of Biohazard Containment & Safety

Canada



UTEX The Culture Collection of Algae

at The University of Texas at Austin

Algae Detail

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UTEX Number: 2714

Class: Chlorophyceae

Strain: *Chlorella vulgaris*

Media: Proteose Medium

Origin: Santa fe de Bogota, Colombia

Description of Location: wastewater-treatment stabilization pond

Type Culture: No

Collection: L.E. Gonzalez (7/94)

Isolation: L.E. Gonzalez (8/94)

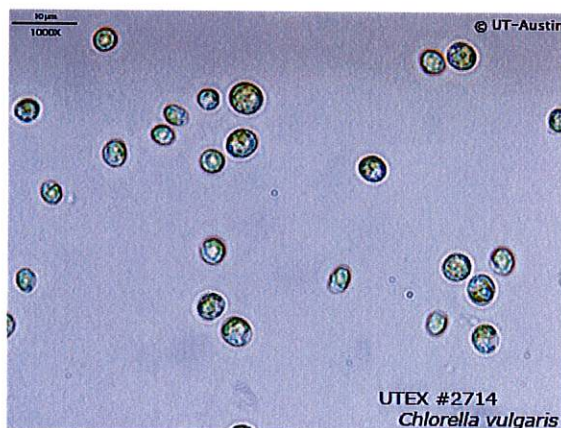
Isolator Number:

Deposition: Y. Bashan (1/24/00)

Relatives:

Also Known As:

Notes: (Gonzalez et al. 1997, Gonzalez & Bashan 2000, Gonzalez-Bashan et al. 2000, Lebsky et al. 2001, de-Bashan et al. 2002a, 2002b, Valderrama et al. 2002); (Hernandez et al. 2009); (de-Bashan et al. 2008b); (de-Bashan et al. 2008c); (de-Bashan et al. 2008d); (de-Bashan et al. 2008e)



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Revenue from Cultures



UTEX The Culture Collection of Algae

at The University of Texas at Austin

Algae Detail

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UTEX Number: LB 1644

Class: Chlorophyceae

Strain: *Dunaliella salina*

Media: 2X Erdschreiber's Medium

Origin: Baja, California, USA

Description of Location: Point Colorado Salinas; La Paz

Type Culture: No

Collection:

Isolation: L. Loeblich (1/67)

Isolator Number: D-18-f

Deposition: A.R. Loeblich III

Relatives:

Also Known As:

Notes: grows on high salinity seawater (5-15% NaCl);(Gonzalez et al. 2001)



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UTEX The Culture Collection of Algae

at The University of Texas at Austin

Algae Detail

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UTEX Number: LB 200

Class: Chlorophyceae

Strain: *Dunaliella salina*

Media: 2X Erdschreiber's Medium

Origin: Russia

Description of Location: dirty, salt lake

Type Culture: No

Collection:

Isolation: F. Mainx

Isolator Number:

Deposition: CCAP (1952-5)

Relatives: CCAP 19/3 aka ON402.PP28; SAG 19-3

Also Known As:

Notes: to CCAP from A. Pascher; somatic hybridization with *Porphyridium* (Lee & Tan 1988); (Gonzalez et al. 2001)



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