

Alireza Saidi-Mehrabad, Ph.D.
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CURRENT ACADEMIC AFFILIATION

Postdoctoral Fellow at Desert Research Institute (DRI) 2021 - present
Division of Hydrologic Sciences
Las Vegas Campus

PROFESSIONAL INTERESTS

I am a microbial ecologist interested in studying the microbial ecology of extreme environments such as terrestrial and marine subsurface, lakes and deep oceans, and permafrost.

EDUCATION

University of Alberta (PhD), Edmonton, Alberta, Canada 2015 - 2020
PhD, Microbiology and Biotechnology
Advisor: Dr. Brian Lanoil
Dissertation: *The effect of climate change on soil microorganisms in Pleistocene-Holocene and Holocene-Anthropocene* (Published)

University of Calgary (MSc), Calgary, Alberta, Canada 2011 - 2013
MSc, Environmental Microbiology
Advisor: Dr. Peter Dunfield
Dissertation: *Characterization of aerobic methane oxidizing bacteria in oil sands tailings ponds* (Published)

Azad University North Tehran Branch (IAU) (BSc), Tehran, Tehran province, Iran 2007 - 2010
BSc, Cellular, Molecular and Microbial Biology.

PUBLICATIONS, PRESENTATIONS

Scopus ID: 55523148700
ORCID ID: orcid.org/0000-0002-2855-9493

PEER REVIEWED PUBLICATIONS

Saidi-Mehrabad, A., Kits, D.K., Kim, J.J., Tamas, I., Schumann, P., Khadka, R., Strilets, T., Smirnova, A.V., Rijpstra, W.I., Sinninghe Damsté, J.S., and Dunfield, P.F. (2020). *Methylicorpusculum oleiharenae* gen. nov., sp. nov., an aerobic methanotroph isolated from an oil sands tailings pond. *IJSEM*. 70:2499-508.

Saidi-Mehrabad, A., Neuberger, P., Cavaco, M., Froese, D., and Lanoil, B. (2020). Optimization of subsampling, decontamination, and DNA extraction of difficult peat and silt permafrost samples. *Sci Rep*. 10:14295.

Saidi-Mehrabad, A., Neuberger, P., Hajihosseini, M., Froese, D., and Lanoil, B. (2020). Permafrost microbial community structure changes across the Pleistocene-Holocene boundary. *Front environ sci*. 8:133.

Dubnick, A., Sharp, M., Danielson, B., **Saidi-Mehrabad, A.**, and Barker, J. (2019). Basal thermal regime affects the biogeochemistry of subglacial systems. *Biogeosci Discuss*. 9:1-22.

Rochman, F.F., Sheremet, A., Tamas, I., **Saidi-Mehrabad, A.**, Kim, J.J., Dong, X., Sensen, C.W., Gieg, L.M., Dunfield, P.F. (2017). Benzene and naphthalene degrading bacterial communities in an oil sands tailings pond. *Front Microbiol*. 8:1845.

Saidi-Mehrabad, A., He, Z., Tamas, I., Sharp, C.E., Brady, A.L., Rochman, F.F., Bodrossy, L., Abell, G.C., Penner, T., Dong, X., Sensen, C.W. (2013). Methanotrophic bacteria in oilsands tailings ponds of northern Alberta. *ISME*. 7:908-21.

An, D., Caffrey, S.M., Soh, J., Agrawal, A., Brown, D., Budwill, K., Dong, X., Dunfield, P.F., Foght, J., Gieg, L.M., Hallam, S.J., Hanson, N.W., He, Z., Jack, T.R., Klassen, J., Konwar, K.M., Kuatsjah, E., Li, C., Larter, S., Leopatra, V., Nesbø C.L., Oldenburg, T., Page A.P., Ramos-Padron, E., Rochman, F.F., **Saidi-Mehrabad, A.**, Sensen, C.W., Sipahimalani, P., Song, Y.C., Wilson, S., Wolbring, G., Wong, M.L., and Voordouw, G. (2013). Metagenomics of hydrocarbon resource environments indicates aerobic taxa and genes to be unexpectedly common. *Environ Sci Technol*. 47:10708-17.

SUBMITTED OR IN PREPARATION

Saidi-Mehrabad, A., Strilets, T., Forster, M., Froese, D., and Lanoil, B. (2020). A major shift in activity and composition of methanotrophs in permafrost active layer soil in response to soil disturbance and temperature changes. (In preparation for publication)

Neuberger, P., **Saidi-Mehrabad, A.**, Froese, D., and Lanoil, B.D. (2020). Bacterial community composition changes independently of edaphic parameters with anthropogenic permafrost thaw. (In preparation for publication).

MacDonald, E., Tank, S., **Saidi-Mehrabad, A.**, and B. Lanoil. (2020). Variable permafrost-DOM biodegradation leached from thaw slump headwalls on the Peel Plateau, NT. (In preparation for publication).

Hajihosseini, M., Amini, P., **Saidi-Mehrabad, A.**, Kozyrskyj, A., and Dinu, I. (2020). A comparative study on statistical methods for infants' gut microbiome data. (In preparation for publication).

BOOK CHAPTERS

Saidi-Mehrabad, A., Kits, D.K., Kim, J.J., Tamas, I., Schumann, P., Khadka, R., Strilets, T., Smirnova, A.V., Rijpstra, W.I., Sinninghe Damsté, J.S., and Dunfield, P.F. (2020). *Methylicorpusculum oleiharenae*. Bergey's Manual of Systematic Bacteriology. (Submitted).

CONFERENCE PRESENTATIONS

Dubnick, A., Sharp, M. J., Danielson, B., **Saidi-Mehrabad, A.**, Barker, J.D. (2020). The biogeochemistry of subglacial systems. AGU Fall Meeting, Online. (Oral presentation).

MacDonald, E., Tank, S., Froese, D.G., Kokelj, S., Lanoil, B., **Mehrabad-Saidi, A.** (2020). Towards linking permafrost history to DOM composition and biodegradation across the western Canada Arctic. AGU Fall Meeting, Online. (Oral presentation).

Saidi-Mehrabad, A. (2019). ACUNS conference, Edmonton Canada. (Guest speaker).

Saidi-Mehrabad, A. (2019). RENR GSA Conference, Edmonton Canada. (Guest speaker).

Saidi-Mehrabad, A., Neuberger, P., Hajihosseini, M., Froese, D., and Lanoil, B. (2019). Soil chemistry, not age, is the primary driving factor correlated to difference in Pleistocene-aged and Holocene-aged permafrost microbiomes. ASM-Arctic Net, Halifax Canada (Oral and poster presentations).

Lanoil, B., Neuberger, P., **Saidi-Mehrabad, A.**, and Froese, D. (2019). AGU conference, San Francisco USA. (Oral and poster presentations).

Saidi-Mehrabad, A., Neuberger, P., Hajihosseini, M., Froese, D., and Lanoil, B. (2017). Microbial community structure is distinct across the Holocene-Pleistocene boundary in ancient Beringian permafrost. ASM-Arctic Net, Québec Canada (Poster presentation).

Saidi-Mehrabad, A., He, Z., Tamas, I., Sharp, C.E., Brady, A.L., Rochman, F.F., Bodrossy, L., Abell, G.C., Penner, T., Dong, X., Sensen, C.W. (2012). Methane oxidizing bacteria in surface layers of oil sands tailings ponds. CSM conference, Vancouver Canada. (Poster presentation).

Saidi-Mehrabad, A., He, Z., Tamas, I., and Dunfield, P. (2012). Methanotrophic bacteria in oil sands tailings ponds of Northern Alberta. 13th ISME conference, Copenhagen Denmark. (Poster presentation).

MANUSCRIPT REVIEWS FOR JOURNALS

Journal of Microbiome

2021

SCHOLARSHIPS, GRANTS, AND AWARDS

Graduate Research Assistant Fellowship (\$3,242 CAD)

2020

University of Alberta Faculty of Graduate Studies and Research

Alberta Innovates Graduate Student Scholarship (\$31,500 CAD)

2017-2019

Government of Alberta

Alberta Graduate Excellence Scholarship (\$12,000 CAD) Government of Alberta	2018-2019
University of Alberta Northern Research Grant (\$2,300 CAD) The University of Alberta Northern Research Awards Committee	2018-2019
Northern Scientific Training Program (\$3,800 CAD) Polar knowledge Canada/Government of Canada	2018-2019
Queen Elizabeth II Graduate Scholarship - Doctoral level (\$15,000 CAD) Government of Alberta (eligible students are nominated by the department)	2016-2017
Steve and Elaine Antoniuk Graduate Award in Arctic Research (\$7,000 CAD) University of Alberta Faculty of Graduate Studies and Research	2016
Graduate Student Research Award (\$5,000 CAD) University of Calgary Faculty of Graduate Studies	2013
Alberta Advanced Education's Achievement Award (\$3,000 CAD) Government of Alberta	2013
Queen Elizabeth II Graduate Scholarship - Master's level (\$10,000 CAD) Government of Alberta (eligible students are nominated by the department)	2012-2013

TEACHING AND SUPERVISION

TEACHING ASSISTANT

Introductory Microbiology, University of Alberta, MICRB265

Teaching Assistant Eight (8) Times, 2015-2020

Responsibilities: 20-25 students per term: hands-on instruction, presentations to lab classes of 60 students, marking of lab reports and assignments, and assisting with exam marking.

Microbiology, University of Calgary, CMMB 343

Teaching Assistant Three (3) Times, 2011-2013

Responsibilities: 23 students per term: instruction in lab methods, supervision lab section open to all enrolled students, and marking of lab reports.

Energy flow in biological systems (BIOL241)

Teaching assistant Two (2) Times, 2011-2013

Responsibilities: 44 students per term: instruction in laboratory techniques and computer based ecosystem modeling and marking lab and online assignments.

STUDENT RESEARCH SUPERVISION

Directly supervised 5 students (4 undergraduates and 1 high school student)

Responsibilities: Designed projects, taught laboratory techniques, aided in data handling and data interpretation, supervised and edited written report and the oral presentation.

- Ashley Gilliland, BIOL 298 2015
Final Report: *Method optimization to extract microbial dna from ancient permafrost: extraction efficiency, contamination control, and the removal of background noise.*
- Tania Strilets, BIOL 398 2018
Final Report: *Methanotrophic responses to active layer disturbances and temperature changes.*
- Nimra Hooda, High school student 2019
Final Report: *Methanotrophs in active layer soil.*
- Malcolm Forster, BIOL 398 2020
Final Report: *Changes in identity of active methane-oxidizing bacteria in permafrost active layer with soil disturbance and changing temperature.*
- Cora Laidlaw, Summer student 2020
Final Report: *Characterization of disturbed and undisturbed permafrost active layer bacteria.*

LEADERSHIP

- Lanoil Laboratory SOP Developer: developed or assisted in developing, writing, and updating laboratory SOPs and procedures (2015 – 2020).
- Lanoil Laboratory Safety Coordinator: trained new graduate and undergraduate researchers on laboratory safety (2015 – 2020).
- Undergraduate Student Posters Judge at the Richard E. Peter Biology conference (2020).
- Member of the Nevada NASA Space Grant Consortium review panel (2021).

METHODS

- Molecular-based methodologies: PCR, qPCR, DNA extraction, DNA stable isotope probing, and high-throughput sequencing.
- Microbial physiology methodologies: gas flux measurements, culture techniques including difficult to culture cryophilic methanotrophic bacteria, and microscopy.

- Computer-based analytical methods: bioinformatics pipelines (such as R, QIIME2, DADA2), phylogenetic analysis (such as Seaview, MEGA-X and ARB), statistical analysis (such as community dynamics, multivariate and diversity analysis), and modeling analysis with the aid of the R language.
- Chemical analysis: analysis of soil edaphic parameters.
- Trained in science ethics, academic integrity, and field work in harsh environments of Northern Canada.

PUBLIC OUTREACH AND VOLUNTEER EXPERIENCE

- Interviewed twice by CJSR FM88.5 radio channel about my PhD research.
- Volunteered and assisted in organizing Association of Canadian Universities for Northern Studies Conference (2018-2019).
- Volunteered and assisted in organizing the 3rd International Symposium on Applied Microbiology and Molecular Biology in Oil Systems (2011).
- General executive member in Circumpolar Students' Association (2018-2020).

CERTIFICATES

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| • Teaching in Canadian classrooms | University of Calgary (2011-present) |
| • Biosafety level 1 and 2 | University of Toronto (2014-present) |
| • Health and safety awareness program | University of Toronto (2014-present) |
| • WHMIS | (2011-present) |
| • Graduate ethic training course | University of Alberta (2015-present) |
| • Teachers' pedagogy training course | University of Alberta (2015-present) |
| • Standard first aid course/CPR/AED | St. John Ambulance Canada (2015-2020) |
| • Supervisory professional development | University of Alberta (2019-present) |
| • Hazardous waste management | University of Alberta (2019-present) |
| • Graduate teaching and learning program level 1 | University of Alberta (2015-present) |
| • Bloodborne pathogens | DRI (2021) |

- Defensive driving training program DRI (2021)
- Biosafety level 2 DRI (2021)

MEDIA AND NEWS

My findings resulted in the public interest where it was featured at the University of Alberta’s scientific news under the title “A climatic crystal ball: How changes in ancient soil microbes could predict the future of the Arctic”. <https://www.ualberta.ca/science/news/2020/august/arctic-soil-climate-change.html>.

CTV Edmonton “Soil microbes may be ‘crystal ball’ in future climate”.

<https://www.facebook.com/watch/?v=365633934429447>

NATIONALITY

American and Canadian dual citizen

REFERENCES

Dr. Brian Lanoil (Associate Professor)

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 CW405 Biol Sci Bldg
 Edmonton AB, Canada T6G 2E9
 lanoil@ualberta.ca
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Dr. Duane Froese (Professor)

University of Alberta
 Department of Earth and Atmospheric Sciences,
 1-26 Earth Sciences Building
 Edmonton AB, Canada T6G 2E3
 duane@ualberta.ca
 (780) 492-1968

Dr. Peter Dunfield (Professor)

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 Department of Biological Sciences
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 Calgary AB, Canada T2N 1N4
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