

CESAR ALEJANDRO PEREZ FERNANDEZ, Ph.D. – MICROBIAL ECOLOGIST

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EDUCATION

2019 University of Puerto Rico, Río Piedras campus, Puerto Rico. Ph.D. in Biology.

2014 Universidad Católica San Pablo, Cochabamba, Bolivia. Certified in higher education based on competency-learning methodology.

2013 Universidad Mayor de San Simón, Cochabamba, Bolivia. Bachelor in Biology.

PROFESSIONAL EXPERIENCE

2023 – to date Assistant Professor, Bolivian Private University.

2019 – 2023 Johns Hopkins University, Maryland. Postdoctoral Fellow in Microbial Ecology of Extreme Environments.

2016 – 2019 Teaching Assistant. General Microbiology – BIOL3705. University of Puerto Rico, Río Piedras campus.

2014 – 2016 Teaching Assistant. General Biology II – BIOL3102. University of Puerto Rico, Río Piedras campus.

2011 – 2012 Research assistant. Center of Water and Environmental Sanitation. Universidad Mayor de San Simón.

2010 Research assistant. Center of Biotechnology. Universidad Mayor de San Simón.

PUBLICATIONS

Research papers

Lily Zhao, **Cesar A. Perez-Fernandez**, Jocelyne DiRuggiero, K. T. Ramesh (*In preparation*).

Dynamic limits of life using *D. radiodurans* as a model.

Claudia Coleine, Manuel Delgado Baquerizo, Eleonora Egidi, Antoine Harfouche, Laura Selbmann, **Cesar A. Perez-Fernandez**, Jocelyne DiRuggiero, Emilio Guirado, Farid Nakhle (2024). The microbiome of drylands: challenges to thrive in arid environments under desertification and climate change. *The ISME Journal*. <https://doi.org/10.1093/ismejo/wrae056>.

Perez-Fernandez, C. A., Wilburn, P., Davila, A., & DiRuggiero, J. (2022). Adaptations of endolithic communities to abrupt environmental changes in a hyper-arid desert. *Scientific Reports*. <https://doi.org/10.1038/s41598-022-23437-w>.

Huang, W., Wang, T., **Perez-Fernandez, C.**, DiRuggiero, J., & Kisailus, D. (2022). Iron acquisition and mineral transformation by cyanobacteria living in extreme environments. *Materials Today Bio*. <https://doi.org/10.1016/j.mtbio.2022.100493>.

Murray, B.; Ertekin, E.; Dailey, M.; Soulier, N.T.; Shen, G.; Bryant, D.A.; **Perez-Fernandez, C.**; DiRuggiero, J. (2022). Adaptation of Cyanobacteria to the Endolithic Light Spectrum in Hyper-Arid Deserts. *Microorganisms*. <https://doi.org/10.3390/microorganisms10061198>.

Cesar A. Perez-Fernandez, Ana Maria Romero Jaldin, Rosario Montaña Mérida, Gary A. Toranzos (2020). Case study at the Laguna Alalay Lake, Cochabamba: thirteen years of environmental dynamics at a eutrophied lake. *AIDIS Journal*. <http://dx.doi.org/10.22201/iingen.0718378xe.2020.13.3.68194>.

Pérez-Fernández, C. A., Iriarte, M., Rivera-Pérez, J., Tremblay, R. L., & Toranzos, G. A. (2019). Microbiota dispersion in the Uyuni salt flat (Bolivia) as determined by community structure analyses. *International Microbiology*. <https://doi.org/10.1007/s10123-018-00052-2>.

Mora-Ruiz, M. D. R., Cifuentes, A., Font-Verdera, F., **Pérez-Fernández, C.**, Farias, M. E., González, B., ... & Rosselló-Móra, R. (2017). Biogeographical patterns of bacterial and archaeal communities from distant hypersaline environments. *Systematic and applied microbiology*. <https://doi.org/10.1016/j.syapm.2017.10.006>.

Cesar A. Perez-Fernandez, Mercedes Iriarte, Wilber Hinojosa-Delgadillo, Andrea Veizaga-Salinas, Raul J. Cano, Jessica Rivera-Perez, Gary A. Toranzos. (2016). First insight into microbial diversity and ion concentration in the Uyuni salt flat in Bolivia. *Caribbean Journal of Science*. <https://doi.org/10.18475/cjos.v49i1.a6>.

Conference papers

Lily Zhao, **Cesar A. Perez-Fernandez**, Jocelyne DiRuggiero, K.T. Ramesh. (2024). Mechanisms in Extremophiles Subjected to Planetary Impact Conditions. 55th Lunar and Planetary Science Conference.

Lily Zhao, **Cesar A. Perez-Fernandez**, Jocelyne DiRuggiero, K.T. Ramesh. (2023). Microbial response to extreme impact stresses. 54th Lunar and Planetary Science Conference.

Lily Zhao, **Cesar A. Perez-Fernandez**, Jocelyne DiRuggiero, K.T. Ramesh. (2022). Experiments on the survivability of extremophiles. 16th Hypervelocity Impact Symposium.

PRESENTATIONS

Oral Presentations

- 2023** Presentation of the Nobel Prize in Medicine and Physiology 2023. UPB Post-graduate Department and Swedish Embassy in Bolivia.
- 2023** “Microorganisms in extreme environments: Exploring the limits of life”, VRI Colloquium, UPB, Cochabamba, Bolivia.
- 2023** “Merchants of doubt”, Science Book Movement, La Paz, Bolivia.
- 2022** “Adaptation of endolithic microorganisms to abrupt changes in the environmental conditions”. 1st Bolivian Symposium of Molecular Biology.
- 2022** “Microbiota dispersion in the Uyuni salt flat (Bolivia) as determined by community structure analyses”. SEMI meeting. Mayagüez, Puerto Rico.
- 2020** “Roles of the regulatory RNA in the adaptation of microbial communities to environmental stress”. 2ND International Congress of Biotechnology. Santa Cruz, Bolivia.
- 2019** “Insights into regional and global dispersion of microorganisms: biogeography of halophiles as a model”. II Scientific Journeys, La Paz, Bolivia.
- 2019** “Multiple working hypotheses to approach complexity in microbial communities”. ASM Microbe 2019, San Francisco, CA.
- 2018** “Detection of ubiquitous and confined microorganisms at a global scale in saline and hypersaline environments: meta-analysis perspective of halophilic communities”. 6th Student research symposium: Passing the torch to the next generations. Interamerican University of Puerto Rico, Ponce campus, Puerto Rico.
- 2017** “Molecular techniques for the study of environmental microbiology”. Science Fridays, Universidad Mayor de San Simón, Cochabamba, Bolivia.
- 2016** “Ecology of microbial communities”. Universidad Mayor de San Francisco Xavier, Sucre, Bolivia.
- 2016** “Microbial ecology and the study of saline environments”. Science Fridays, Universidad Mayor de San Simón, Cochabamba, Bolivia.
- 2015** “Rank-abundance’s tail presents DNA from some possible fecal contamination indicators in the largest hypersaline environment in the world”.

4th Student research symposium: Passing the torch to the next generations.
University of Puerto Rico, Cayey campus, Puerto Rico.

2009

12th Job Fair. Universidad Mayor de San Simón.

Poster presentations

2023

“The Effect of Dynamic Pressure on the Gene Expression of *Deinococcus radiodurans* R1”. Cold Spring Harbor Laboratory Genome Informatics Conference.

2021

“Microbial endolithic communities are resilient to dramatic changes in humidity and temperature at the Atacama Desert”. Cold Spring Harbor Laboratory Genome Informatics Conference.

2019

“Roles of the regulatory small RNAs in the adaptation of endolithic microbial communities to environmental stress”. Extreme Biology/Biophysics meeting, San Diego, CA.

2019

“Multiple working hypotheses to approach complexity on microbial communities”. ASM Microbe 2019, San Francisco, CA.

2019

“Global scale analyses of ubiquitous and confined microorganisms in saline and hypersaline environments”. ASM Microbe 2019, San Francisco, CA.

2018

“Thirteen years of environmental dynamics in Laguna Alalay Lake, Bolivia, a eutrophic lake”. ASM Microbe 2018, Atlanta, Georgia.

2016

“Microbial community assembly at the biggest natural salt flat in the world: Uyuni salt flat, Bolivia”. Halophiles 2016, 11th General meeting. San Juan. Puerto Rico.

2015

“Rank-abundance’s tail presents DNA from some possible fecal contamination indicators in the largest hypersaline environment in the world”. 18th International Symposium on health-related water microbiology. Lisbon, Portugal.

2015

“Microbial community structure at the biggest natural salt flat in the world: Salar de Uyuni, Bolivia”. ASM 115th General Meeting, New Orleans.

Courses and workshops

2020

“Introduction to Bioinformatics: Applications and concepts in microbial genetics”. iGEM, Bolivia.

MENTORING

Graduate students

PhD students

2021-to date Lily Zhao

Project: Dynamic limits of life. The Johns Hopkins University.

Master students

2023-to date Faviola Pinto Estrada

Project: Effect of biofertilizers on the quinoa rhizosphere fungal communities. Universidad Mayor de San Andres.

Conecta Mentora (Mentoring Network)

2022

Paula Lino Laguna

Milena Zara Mendoza Mendoza

Magaly Lucana Mamani

Conecta Mentora is an initiative to connect Bolivian students with mentors with experience in different fields, I guided the three students in pursuing international scientific careers in Biology.

IGEM competition

2021

Bolivian team advisor. Project: Arsemaphore, a biosensor to detect arsenic pollution in drinking water.

Gold medal in the general synthetic biology competition, best human practices, and best inclusivity awards.

RESEARCH EXPEDITIONS

2020 Atacama Desert, Chile

Project: Microbial adaptations to extreme dryness as Mars analog environments.

2012 Uyuni Salt Flat, Bolivia

Project: Biodiversity of the Uyuni Salt Flat.

OTHER PROFESSIONAL ACTIVITIES

Invited *ad-hoc* reviewer

Scientific Reports

Archives of Microbiology

Frontiers in Microbiology

Environmental Microbiome

PROFESSIONAL REFERENCES

Dr. Jocelyne DiRuggiero (Post-doc advisor) – Johns Hopkins University, Homewood campus – email: jdiruggiero@jhu.edu, Phone number: +1 410-516-8498.

Dr. Alfonso Davila (Post-doc research colleague) – NASA Ames Research Center, Exobiology branch – email: alfonso.davila@nasa.gov, Phone number: +1 650-604-0695.

Dr. Gary Toranzos (Ph.D. thesis advisor) – University of Puerto Rico, Rio Piedras campus – email: gary.toranzos@upr.edu, Phone number: +1 787-764-0000 ex. 88118.