

Daniel Plaza Sáez

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Education

- 2016: **PhD student in Chemical Engineering and Biotechnology**, University of Chile. Centre for Biotechnology and Bioengineering (CEBIB).
- 2014: **Master of Biochemistry** (with honours), University of Chile. Thesis: “**Isolation of Antarctic bacteria resistant to cadmium and tellurite capable to produce fluorescent nanoparticles**”. Dr. José Pérez-Donoso. Center for Bioinformatics and Integrative Biology (CBIB), University Andrés Bello.
- 2010: **Food Science Engineer** (second best-ranked student), University of La Serena. Thesis: “**Genetic diversity of Algarrobo (*Prosopis chilensis*) in Coquimbo region and its correlation with the proximate composition of their fruits**”. Dr. Ximena Moncada. Plant Molecular Biology Lab, Center for Advanced Studies in Arid Zones (CEAZA).
- 2008: **Bachelor of Food Sciences** (first graduate of generation), University of La Serena.

Awards and Honours

- 2016: **Young Scientists Program**. Awarded by International Union of Biochemistry and Molecular Biology (IUBMB) to the most outstanding 40 young scientists worldwide (Vancouver, Canada).
- 2016: **Pacific Alliance Scholarship**. Awarded by the Pacific Alliance for advanced human capital training in a member country.
- 2016: **Fellowship for National Doctoral Programmes**. Awarded by National Commission for Scientific and Technological Research (CONICYT). Ministry of Education, Chile. Funding for excellence graduate students.
- 2016: **Ecology and Diversity of Marine Microorganisms (ECODIM IX) Program**. Research trainee award for international young scientists. University of Concepcion, Chile.
- 2013: **Fellowship for Postgraduate Thesis on Antarctic Issues**. Awarded by Chilean Antarctic Institute (INACH), Ministry of Foreign Affairs, Chile.
- 2013 and 2012: **Graduate School Fellowship for National Conferences**. Funded by University of Chile.
- 2013: **International Research Fellowship for Graduate Students**. Awarded by University of Chile. Ludwig-Maximilians-Universität München (University of Munich). Munich, Germany.
- 2012: **Fellowship “Canada-Chile Leadership Exchange”**. Awarded by Department of Foreign Affairs, Trade and Development, Canadian Government. McGill University. Montreal, Canada.
- 2011: **Fellowship for National Master Programmes**. Awarded by National Commission for Scientific and Technological Research (CONICYT), Ministry of Education, Chile.
- 2006: **Bicentennial Scholarship**. Awarded by Ministry of Education, Chile. Funding for undergraduates with outstanding academic performance.

Research Experience

- 2017: Research training: **“Development of novel synthetic antimicrobial peptides”**. Prof. Dr. Sergio Orduz. Faculty of Sciences, National University of Colombia. (Mar-present)
- 2015–2016: Collaboration: **“Effects of fungal endophytes on ecophysiological performance and biochemical responses in *Deschampsia antarctica* plants under current and future global climate change scenarios”**. Dr. Rómulo Oses. Plant Ecophysiology Lab, CEAZA. La Serena, Chile. (Aug-Dec)
- 2015: Assistant Researcher: **“Unravelling the regulatory mechanisms that modulate grain yield performance during water stress of *Chenopodium quinoa*: Relationship between drought tolerance and senescence during grain filling”**. Dr. Luisa Bascuñan. Biotechnology Lab, CEAZA. La Serena, Chile. (May-Dec)
- 2014: Assistant Researcher: **“Identification of antimicrobial peptides from Chilean coastal mollusks and its potential biotechnological use”**. Dr. María Inés Becker. Foundation Science and Technology for Development. Santiago, Chile. (Mar-Dec)
- 2012–2013: **Master thesis**. Bionanotechnology and Microbiology Group, Center for Bioinformatics and Integrative Biology (CBIB). Santiago Chile. (May-Nov)
- 2013: Research stay: **“Evaluation of fluorescent nanoparticles biosynthesized by magnetotactic bacterium *Magnetospirillum gryphiswaldense*”**. Prof. Dr. Dirk Schüler. Magnetic Bacteria Group, Biocenter from Faculty of Biology, Ludwig–Maximilians–Universität München. Munich, Germany. (Jun-Aug)
- 2012–2013: Research trainee: **“Characterization of nanoparticles biosynthesized by Antarctic bacteria”**. Prof. Dr. Jay Nadeau. Department of Biomedical Engineering, McGill University. Montreal, Canada. (Oct-Jan)
- 2011–2012: Research unit: **“Isolation and characterization of bacteria resistant to heavy metals producers of quantum dots from mining wastes”**. Dr. José Manuel Pérez. Biochemistry and Molecular Biology Lab, University of Chile. Santiago, Chile. (Dec-Jan)
- 2011: Research unit: **“Assesment of genotoxic potential of methyl methanesulfonate using the zebrafish model”**. Dr. Manuel Ellahueñe. Bioassays Lab, National Center of Environment (CENMA). Santiago, Chile. (Aug-Nov)
- 2009–2011: Research Assistant: **“Genetic diversity analysis of *Prosopis flexuosa* populations located in “Quebrada Morel” priority site”**. Dr. Alexandra Stoll. Plant Molecular Biology Lab, CEAZA. La Serena, Chile. (Dec-Feb)
- 2009: Research Assistant: **“High hydrostatic pressure effect on physicochemical properties of proteins and their interactions with selected food additives”**. Prof. Dr. Gipsy Tabilo. Biochemistry Lab, University of La Serena. (Aug-Dec)
- 2007–2009: Research Assistant: **“Genetic divergence of Algarrobo (*Prosopis chilensis*): Basis for selection and breeding program”**. Dr. Ximena Moncada. Plant Molecular Biology Lab, CEAZA. La Serena, Chile. (Dec-Jun)
- 2006: Research unit: **“R&D Capacity of global aquaculture production: Balanced food for exportable species”**. Prof. Dr. Mario Pérez-Won. Processing Plant, Department of Food Engineering, University of La Serena. (Jul-Dec)

Publications

- 2016: **“Biological synthesis of fluorescent nanoparticles by cadmium and tellurite resistant bacteria from Antarctica: Exploring novel natural nanofactories”**. Plaza DO, Gallardo C, Straub YD, Bravo D and Pérez-Donoso JM. *Microbial Cell Factories Journal*. DOI: 10.1186/s12934-016-0477-8.
- 2017: **“Genetic diversity and population structure of the vulnerable tree *Prosopis chilensis* (Molina) Stuntz in the transversal valleys of the Coquimbo Region, Chile”**. Moncada X, Plaza DO, Stoll A, Payacán C, Seelenfreund D, Martínez E, and Squeo FA. Submitted to *New Zealand Journal of Botany*.
- 2014: **“Low-temperature biosynthesis of fluorescent semiconductor nanoparticles (CdS) by oxidative stress resistant Antarctic bacteria”**. Gallardo C(*), Monrás JP(*), Plaza DO, Collao B, Saona LA, Durán-Toro V, Venegas FA, Soto C, Ulloa G, Vásquez CC, Bravo D and Pérez-Donoso JM. *Journal of Biotechnology*. 187:108–115. (*)= Same contribution.
- 2012: **“Nanotechnology from Antarctic: Isolation of bacteria able to produce fluorescent nanoparticles”**. Gallardo C, Plaza DO, Monrás JP, San Martín C, Bravo D, Vásquez CC and Pérez-Donoso JM. *Chilean Antarctic Reviews*.
- 2011: **“Effect of air-temperature and diet composition on drying process of pellets for Japanese Abalone (*Haliotis discus hannai*) feeding”**. Vega-Galvez A, Lemus-Mondaca R, Plaza-Sáez D and Pérez-Won M. *Science and Food Technology*. 31:694–702.

In preparation:

- 2017: **“Emerging challenges and perspectives for microbial production of large polysaccharides: Hyaluronic acid as a case study”**. Plaza DO and Asenjo JM. *Intended for Biotechnology and Bioengineering Journal*.
- 2017: **“Biomimetic CdTe-GSH quantum dots as photosensitizers in photodynamic therapy: A perspective from photophysics to molecular biology”**. Straub YD, Monsalve AC, Plaza DO, Guimaraes F, Pérez-Donoso JM. *Intended for PNAS Journal*.

International Conferences

- 2016: **16th International IUBMB Congress: “Signalling Pathways in Development, Disease and Aging”**. Plaza DO, Gallardo C, Straub YD, Bravo D and Pérez-Donoso JM. “Synthesis of fluorescent nanoparticles by using bacteria from Antarctica: new prospects from mysterious inhabitants” (Poster). *Vancouver, Canada*.
- 2016: **Association for the Sciences of Limnology and Oceanography Summer Meeting**. Balooza M, Rodríguez C, Plaza DO, Yáñez S, Bailey J, and Hansselman K. “A novel approach for the enrichment of “macrobacteria” from anoxic sediment in Coliumo Bay, Chile”. *New Mexico, United States*.
- 2014: **XXII Latin American Congress of Microbiology and IV Colombian Conference of Microbiology**. Plaza DO, Gallardo C, Bruna N, Bravo D and Pérez-Donoso JM. “Potential of Antarctic bacteria to synthesize fluorescent nanoparticles: Exploiting the biomineralization of heavy metals” (Poster). *Cartagena de Indias, Colombia*.

- 2013: **XII Panamerican Association for Biochemistry and Molecular Biology (PABMB) Congress, XXXVI Meeting of Biochemistry and Molecular Biology Chilean Society, LVI Meeting of Biochemistry and Molecular Biology Argentinian Society, and 4th Latin American Protein Society Meeting.** *Plaza DO, Gallardo C, Straub Y and Pérez-Donoso J.* “Low temperature biosynthesis of fluorescent nanoparticles by a *Sherwanella* sp. isolated from Antarctica: Potential of a multiresistant genus to produce intracellular nanostructures from heavy metals” (Poster). *Puerto Varas, Chile.*
- 2013: **XII Panamerican Association for Biochemistry and Molecular Biology (PABMB) Congress, XXXVI Meeting of Biochemistry and Molecular Biology Chilean Society, LVI Meeting of Biochemistry and Molecular Biology Argentinian Society, and 4th Latin American Protein Society Meeting.** *Straub Y, Muñoz C, Plaza DO and Pérez-Donoso JM.* “Use of biomimetic CdTe-GSH quantum dots in Photodynamic Therapy (PDT): Understanding the molecular mechanism of phototoxicity” (Poster). *Puerto Varas, Chile.*
- 2013: **5th Congress of European Microbiologists (FEMS).** *Gallardo C, Plaza DO, Monrás JP, Venegas F, Saona L, Duran V, Pizarro J, Gran A, Órdenes N, Straub Y, Vega F, Ulloa G, Pradenas G, Bravo D and Pérez-Donoso JM.* “Isolation of oxidative stress resistant Antarctic bacteria able to biosynthesize fluorescent semiconductor nanoparticles (CdS and CdTe) at low temperatures” (Poster). *Leipzig, Germany.*
- 2013: **10th International Conference on Nanosciences and Nanotechnologies.** *Plaza DO, Straub Y, Gallardo C, Bruna N, Monrás JP, Bravo D and Pérez-Donoso JM.* “Low temperature biosynthesis of CdS and CdTe quantum dots by two *Pseudomonas* spp. isolated from Antarctica: New insights related to cadmium and tellurite resistance” (Poster). *Thessaloniki, Greece.*
- 2013: **10th International Conference on Nanosciences and Nanotechnologies.** *Gallardo C, Plaza DO, Venegas FA, Saona L, Durán-Toro V, Órdenes N, Straub YD, San Martín C, Monrás JP and Pérez-Donoso JM.* “Microbiology and nanotechnology: working for green synthesis of biocompatible nanoparticles with biotechnological applications” (Poster). *Thessaloniki, Greece.*
- 2013: **10th International Conference on Nanosciences and Nanotechnologies.** *Straub YD, Plaza DO, Tsutae F, Guimaraes F and Pérez-Donoso JM.* “Cost effective CdTe-GSH quantum dots as Photosensitizers in Photodynamic Therapy” (Poster). *Thessaloniki, Greece.*
- 2013: **10th International Conference on Nanosciences and Nanotechnologies.** *Venegas FA, Durán VM, Plaza DO, Monrás JP and Pérez-Donoso JM.* “Bacterial biosynthesis of CdS quantum dots: Relevance of metabolic state and cellular fate” (Poster). *Thessaloniki, Greece.*
- 2013: **VII Latin American Congress of Antarctic Science.** *Plaza DO, Straub, YD, Gallardo, C, Bruna N, Monrás JP, Bravo D and Pérez-Donoso JM.* “Biosynthesis of fluorescent nanoparticles using psychrotolerant bacteria genus *Psychrobacter*: Comparative advantages of Antarctic continent” (oral). *La Serena, Chile.*
- 2012: **10th Nacional Conference on Biology.** *Pérez-Donoso JM, Plaza DO, Gallardo C, Ordenes N, Gálvez F, Saona L, Soto L, Toro O, Estay N, Monrás JP and Bravo D.* “Antarctic continent as source of bioresources: Seeking microorganisms of biotechnological interest” (Conference). *Ica, Perú.*
- 2012: **10th Nacional Conference on Biology.** *Pérez-Donoso JM, Monrás JP, Plaza DO, Gallardo C, Venegas F, Straub Y, San Martín C, Pradenas G and Bravo D.* “Bacteria as factories of fluorescent nanoparticles: in search of a molecular mechanism of cadmium biomineralization” (Conference). *Ica, Perú.*

- 2010: **X Latin American Botanical Congress.** *Plaza DO, Moncada X, Martínez EA and Squeo FA.* “Diversity and genetic structure of Algarrobo (*Prosopis chilensis* Mol. Stuntz) in the Region of Coquimbo using nuclear microsatellites” (Poster). *La Serena, Chile.*
- 2010: **X Latin American Botanical Congress.** *Moncada X, Plaza DO, Stoll A, Martínez EA and Squeo FA.* “Genetic diversity of Algarrobo along a moisture gradient in the Region of Coquimbo, Chile” (Symposium). *La Serena, Chile.*
- 2010: **X Latin American Botanical Congress.** *Stoll A, Plaza DO, Moncada X, Muttoni FJ, López-Lauenstein D and Verga AR.* “*Prosopis flexuosa* in the Arid Chaco, El Monte and Atacama: Morphology of leaves as an index of adaptive and genetic differences” (Poster). *La Serena, Chile.*
- 2009: **VII Symposium on Genetic Resources for Latin America and the Caribbean.** *Moncada X, Plaza DO, Díaz D, Martínez EA, and Squeo FA.* “Diversity of Algarrobo (*Prosopis chilensis* Mol. Stuntz) in Coquimbo Region, Chile” (Symposium). *Pucón, Chile.*
- 2007: **III Binational Meeting of Ecology.** *Moncada XA, Plaza DO, Martínez EA and Squeo FA.* “Genetic diversity of Algarrobo (*Prosopis chilensis*) in arid Chile: First results using microsatellite markers” (Poster). *La Serena, Chile.*

Relevant National Conferences

- 2014: **III National Conference of Nanotechnology.** *Saona L, Monrás JP, Órdenes-Aenishanslins N, Durán-Toro V, Gallardo C, Plaza DO, Díaz V, Venegas F, Gran-Scheuch A, Schofield D, Ulloa G, Bravo D, Collao B and Pérez-Donoso JM.* “Using nanotechnology and microbiology to biosynthesize fluorescent semiconductor nanoparticles with biotechnological applications” (Symposium). *Puerto Varas, Chile.*
- 2013: **XXXV Conference of Microbiology Chilean Society.** *Soto L, Monrás JP, Saona L, Gran A, Órdenes N, Gallardo C, Plaza DO, Straub Y, and Pérez-Donoso JM.* “Use of the bacterial model for school education in sciences: Teaching microbiology from Antarctica” (Symposium). *Maitencillo, Chile.*
- 2013: **1st National Conference on Optics and Photonics.** *Straub Y, Plaza DO, Bagnato V, Guimaraes F, and Pérez-Donoso JM.* “Study of photophysical properties of CdTe-GSH synthesized by green chemistry” (Poster). *Santiago, Chile.*
- 2012: **II National Conference of Nanotechnology and V Nanostructures School.** *Plaza DO, Gallardo C, Vega F, San Martín C, Monrás JP and Pérez-Donoso JM.* “Potential of Antarctic bacteria to biosynthesize semiconductor fluorescence nanoparticles or quantum dots: First results” (Poster). *Valparaíso, Chile.*
- 2012: **XXXIV Conference of Microbiology Chilean Society.** *Plaza DO, Gallardo C, Vega F, Ulloa G, San Martín C, Durán Y, Monrás JP, Bravo D and Pérez JM.* “Finding Antarctic bacteria able to resist heavy metals to biosynthesize semiconductor nanoparticles or quantum dots” (Poster). *Valdivia, Chile.*
- 2012: **XXXIV Conference of Microbiology Chilean Society.** *Gallardo C, Plaza DO, Monrás JP, San Martín C, Bravo D and Pérez JM.* “Isolation of Antarctic microorganisms resistant to reactive oxygen species (ROS) and its potential use on biosynthesis of fluorescent nanoparticles at low temperatures” (Poster). *Valdivia, Chile.*

- 2012: **XXXIV Conference of Microbiology Chilean Society.** *Saona L, Monrás JP, Plaza DO, Gallardo C, Pradenas G, Durán Y, Gálvez F, San Martín C, Vega F, Ulloa G, Venegas F and Pérez JM.* “Biosynthesis of semiconductor fluorescence nanoparticles by *Bacillus mycoides* isolated from Eastern Island” (Poster). *Valdivia, Chile.*
- 2008: **XX Annual Meeting Botanical Society of Chile.** *Moncada X, Plaza DO, Díaz D, Martínez EA, and Squeo FA.* “Genetic diversity study of Algarrobo (*Prosopis chilensis* Mol. Stuntz) in Coquimbo Region (Chile) using nuclear and cytoplasmic microsatellites” (Symposium). *Pucón, Chile.*
- 2008: **59th Agronomic conference of Chile and 9th Congress of Chilean Society of Horticulture”.** *Plaza DO, Díaz D, Martínez E, Squeo FA, and Moncada X.* “Analysis of genetic diversity of Algarrobo (*Prosopis chilensis*), species with great potential to agroindustry” (Poster). *La Serena, Chile.*

Relevant Teaching

- 2016: **Auxiliar professor:** Laboratory of Microbiology. Finis Terrae University. Santiago, Chile.
- 2015: **High School Scientific Advisor: “XII Antarctic School Fair”.** Project: “Effect of increased Antarctic UV radiation on phenols production in macroalgae”. Competence organized by Chilean Antarctic Institute (INACH).
- 2014: **High School Scientific Advisor: “XI Antarctic School Fair”.** Project: “Are there contaminants in the Antarctica? ” (shortlisted). INACH.
- 2013: **Collaborator of the winners of “Stockholm Junior Water Prize”.** Project: “*Psychrobacter*: Antarctic Cooperation on Bioremediation of Oil-Contaminated Waters”. Stockholm, Sweden.
- 2012: **Collaborator of the winners “IX Antarctic School Fair”.** INACH.
- 2009: **Expositor of programme: “1,000 Scientists, 1,000 Classrooms”.** National Commission for Scientific and Technological Research (CONICYT), Ministry of Education, Chile.
- 2009: Seminar: **“Current Insights of Food Biotechnology”.** Prof. Elena Lara. Department of Food Engineering, University of La Serena.

Relevant Courses

- 2017: **“Synthetic Biology: Experimental Strategies”.** Institute of Biochemistry and Microbiology. Austral University of Chile. *Valdivia, Chile.*
- 2016: **“Fundamentals of Virology: Biochemical, Cellular, and Structural Aspects”.** University Andrés Bello. *Santiago, Chile.*
- 2015: **“Use of Molecular Tools for Characterisation of Microorganisms and their Interactions with Plants”.** Center for Advanced Studies in Arid Zones (CEAZA). *La Serena, Chile.*
- 2015: **II Workshop on Biophysics.** Pontifical Catholic University of Chile and University of Valparaíso. *Viña del Mar, Chile.*
- 2015: **“Plant–Soil Interaction: Ecophysiology of the Rhizosphere”.** Institute for Environmental and Evolutionary Sciences, Austral University of Chile. *Valdivia, Chile.*

- 2013: “**Biological Photoreceptors: Function, Structure, Photophysics and Photochemistry of Chromophores**”. Dr. Silvia Braslavsky, Max Planck Institute for Chemical Energy Conversion, Germany. University of Chile. *Santiago, Chile.*
- 2013: “**Bioinformatics: Functional Genomics Topics**”. Dr. Daniel Almonacid, Center of Bioinformatics and Integrative Biology (CBIB), University Andrés Bello. *Santiago, Chile.*
- 2012: “**Electronic Microscopy: Applications in Biology and Materials**”. Dr. Carmen López, University of Barcelona, Spain. University of Chile. *Santiago, Chile.*
- 2011: “**Molecular Biology**”. Dr. Daniela Seelenfreund and Dr. Sergio Lobos. University of Chile. *Santiago, Chile.*
- 2010: “**How to write scientific publications**”. Dr. Blanca Pérez-García, Metropolitan Autonomous University, and Dr. Yury Okolodkov, University Veracruzana, Mexico. University of La Serena. *La Serena, Chile.*
- 2008: “**Scientific writers**”. Dr. José Valderrama. Faculty of Engineering, University of La Serena. *La Serena, Chile.*
- 2007: “**General Genetics**”. Prof. Claudio Palma. Faculty of Sciences, University of La Serena. *La Serena, Chile.*

Languages

- 2009–2011: **German courses from DAAD** (4 levels: 1.1, 1.2, 2.1 and 2.2). University of La Serena.
- 2008–2009: **English courses** (Intermediate I–II, Conversational I–II). University of La Serena.
- IELTS Academic (English test): 6.5