



able

The advantage of sustainability

To provide added value to the mineral resources of Chile and to create environmentally friendly and at the same time industry applicable technologies, Dr. José Manuel Pérez-Donoso, researcher from the Center for Bioinformatics and Integrative Biology, Faculty of Biological Sciences at Universidad Andrés Bello, is leading research on the use of microorganisms isolated from extreme environments in Chile in the production of lithium and copper nanoparticles.

Dr. Pérez-Donoso explains that an additional objective is to explore the distinct applications that these new nanoparticles could have. "In the case of copper, we are characterizing its possible use as a photosensitizer in solar cells. [If applied, this research will be the first to] develop solar cells from copper and with a biological origin."

The research lead by Dr. José Manuel Pérez-Donoso has already achieved important advances. Specifically, a series of unique bacteria have been isolated from samples extracted during expeditions to Antarctica and the Atacama Salt Flats. "These organisms are highly resistant to copper and lithium and are able to synthesize nanoparticles of these metals," adds Dr. Pérez-Donoso.

Likewise, Dr. Pérez-Donoso states that these bacterial isolates could have applications in making the mining industry more sustainable. "With these bacteria, we are developing methods to decontaminate solutions with copper or cadmium. The remediation of these metals enables the generation of high-value copper nanoparticles," continues Dr. Pérez-Donoso.

Finally, Dr. Pérez-Donoso is evaluating the application of synthesized lithium nanoparticles in rechargeable batteries. "These types of batteries represent the new generation of rechargeable batteries, and we hope to incorporate our nanoparticles [into their development] to promote ecofriendly batteries production."