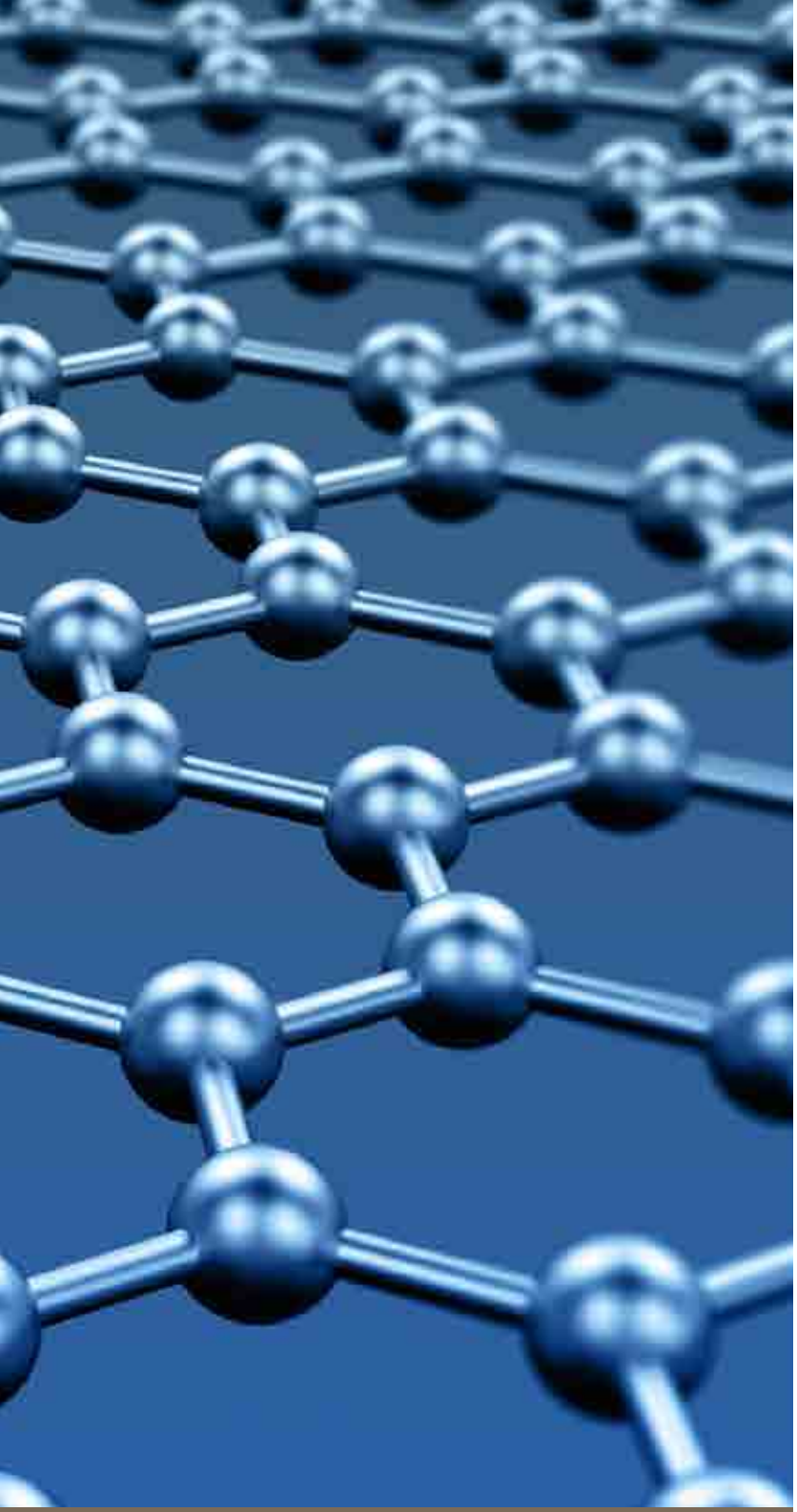

ara la purificación

Purifying water through nanotechnology

The effects of global warming, poor water resource management, a growing human population, and increased contamination have resulted in water shortages in certain regions of the world. This phenomenon not only endangers the existence of thousands of species across the planet, but will also greatly challenge the way in which humans live.

Addressing this problem, Dr. Walter Orellana –researcher for the Faculty of Exact Sciences at Universidad Andrés Bello– and the post-graduate student Raúl Guerrero, are working on using graphene to desalinize and purify water.

"Graphene is currently one of the most important nanomaterials in the world as it possesses unique characteristics. It is stronger than steel but has 1/6th of the weight and the width of one atom," explains Dr. Orellana.

The research objective of Dr. Orellana is to create a purification sieve from layers of nanoporous graphene used as a membrane. This graphene-based sieve could then filter water under standardized conditions of pressure and temperature. Importantly, water filtration through graphene would remove salts, such as chlorine and sodium ions, and eliminate highly toxic elements, such as arsenic.

"Through quantum computer simulations, we have obtained our first results. These indicate that pores 1.3 nanometers in diameter would effectively block saltwater ions while allowing an adequate flow of water molecules at relatively low pressures, taking into account the size of the pores," explains Dr. Walter Orellana.

Likewise, Dr. Orellana highlights that the results of this research could be significant to society. "We would be able to face water shortages in the world; in Northern Chile, for example, where a lack of uncontaminated freshwater is a growing problem."