



Nanoscience applied to medicine

In recent years, scientific advances have focused on searching for new technological tools able to solve a wide range of problems efficiently, rapidly, and locally.

In response to this need, the field of bionanotechnology is dedicated to the design and construction of highly specialized microscopic structures. These structures present modifiable properties that can be adjusted to specific objectives.

Research led by Dr. Ramiro Arratia-Pérez, Director for the Millennium Nucleus of Catalysis and Biosensor Molecular Engineering and for the Doctorate Program in Molecular Physicochemistry of the Faculty of Exact Sciences at the Universidad Andrés Bello, aims to design new molecules, clusters, and luminescent nanostructures based on the mineral resources of Chile.

“To build these structures, we apply molecular engineering concepts in computational simulations; the goal of this being to design biosensors applicable to a number of fields, such as in medicine, agrosciences, the textile industry, and even in some LED and OLED screens,” highlights Dr. Arratia-Pérez.

Dr. Arratia-Pérez further explains that, “our research is performed in direct and synergetic relationship with the area of molecular modeling, which is used as a predictive tool to design new nanostructures and molecules.”

One of the primary applications for these technologies is in the creation of new methods for detecting certain types of cancers. Once inside the patient, these luminescent molecules bind to cancerous tissue, and, using imaging techniques, it is possible to observe the illumination of these molecules. Therefore, these molecules act as markers of tumor masses.

Dr. Arratia-Pérez’s team includes eight researchers from the Universidad Andrés Bello, four post-doctorate fellows, and fifteen doctoral candidate students. Together, this team has published more than 270 ISI-indexed manuscripts.

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