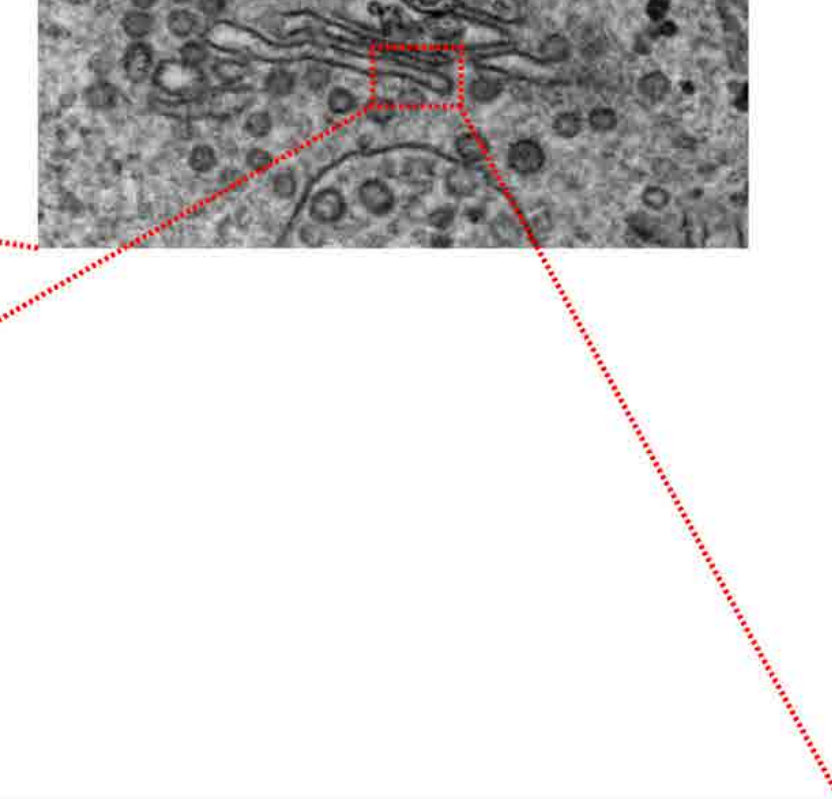

Discovering the mysteries of the cell

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The cell is a complex system in which each molecule fulfills a specific function that maintains homeostasis and proper functioning.

The membrane transport system is one of the most important within the cell. This system controls the size, shape, and composition for the majority of cellular components. Moreover, membrane transport is responsible for the secretion of hormones, proteins, and antibodies.

Alterations in the membrane transport system may produce diverse pathologies, including cystic fibrosis, hypercholesterolemia, coagulation defects, leukemia, diabetes, and neurodegenerative diseases, among others. Therefore, fully understanding the mechanisms of membrane transport might indicate a way in which to prevent these pathologies or, eventually, provide treatment.

Recent research by Dr. Jorge Cancino, investigator for the Faculty of Biological Sciences at the Universidad Andrés Bello, Viña del Mar Campus, established that this system is modulated by a protein called the KDEL receptor, representing a novel finding that goes against what was previously thought. This receptor is also involved in modulating autophagy, the process by which the cell eliminates defective proteins.

"This system is of great importance to the cell as it can detect decreases or increases in the flow of proteins. If proteins accumulate in the Golgi apparatus, this could produce dysfunctions in later stages or, in other words, at the moment when proteins should fulfill their roles," states Dr. Cancino.

Finally, Dr. Cancino highlighted that the upcoming stages of this research will examine and define the molecular basis and functional significance of coordination between membrane transport and other cellular functions. "We hope that describing the structure and molecular composition of this control system in detail will contribute towards understanding the physiopathology of the membrane transport system and, consequently, provide tools that will allow us to manipulate this process. This manipulation could prevent or treat cells affected by pathologies resulting from an improper functioning of this system," adds Dr. Cancino.