contra las

urodegenerativas

The scientific fight against neurodegenerative diseases

Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease of unknown origin. This disease affects motor neurons (or motoneurons) in the human body and, over time, these motoneurons die. This impedes self-control of the body and generates rigidity, the inability to move and, in the later stages of the disease, impairs breathing.

The Center for Biomedical Investigation (CIB) of Universidad Andrés Bello is one of two laboratories in Chile researching this disease. The CIB team, led by Dr. Brigitte van Zundert and supported by CIB Director Dr. Martín Montecino and Dr. Lorena Varela, has achieved important advancements that have increased our knowledge on the nature of ALS.

Dr. van Zundert highlights that this line of research has so far demonstrated that ALS begins at a very young age, decades before even the first motor symptoms appear. "Taking this into account, our goals are to uncover the exact mechanisms that trigger ALS at a young age and, through this, identify pre-symptomatic biomarkers. If we achieve this, the patient will be able to prevent disease onset through specific medicines, a healthy diet, and frequent physical activity. This early diagnosis will also prevent the psychological stress that many ALS patients suffer." Other advancements made by the CIB team include the identification of cells in the brain that are involved in ALS. "We discovered that astrocytes, which are very important in the metabolic support of neurons, can provoke motoneuron death by releasing a toxic factor. We found that the target of this factor is a voltage-gated channel located on the motoneuron's membrane. When the channel is activated by the toxic factor, the motoneuron becomes overactive and dies," adds Dr. van Zundert.

Dr. van Zundert concludes, "In our most recent work, we are generating brain cells through the reprogramming of induced pluripotent stem cells (iPSC). These cells give rise to skin cells (fibroblasts) in healthy and ALS patients. The objective of this study is to establish if these reprogrammed human cells harm the motoneurons through the same primary mechanisms observed in other models."