

Using neuroimaging to reveal the role of myelin in cognitive impairment

Within its GIPUZKOA NEXT call, the Charter Provincial Council of Gipuzkoa has awarded funding to CIC biomaGUNE's MIELIMAGEN project

The aim is to study the role of myelin in the deterioration associated with healthy aging, compared with the deterioration associated with pathological processes

Donostia-San Sebastian. 26 October, 2022. As part of its [Gipuzkoa Science, Technology and Innovation Network Program](#), the Charter Provincial Council of Gipuzkoa has awarded funding to the MIELIMAGEN project led by CIC biomaGUNE's Ikerbasque research professor Pedro Ramos-Cabrer. The MIELIMAGEN project aims to study the role played by myelin in cognitive impairment processes; myelin is a substance that surrounds and protects the axons of neurons and its main function is to increase the speed of nerve impulse transmission. In the project, the [Magnetic Resonance Imaging Lab](#) team will be studying the role of myelin in the processes of mild cognitive impairment, naturally associated with healthy aging, and comparing it with severe cognitive impairment associated with pathological neurodegeneration processes (Alzheimer's disease, Parkinson's disease, vascular dementia, multiple sclerosis, etc.).

"If we are better acquainted with how demyelination processes affect the structure and functioning of neuronal networks in healthy and pathological subjects, we will be able to design early diagnostic tools to detect neurodegenerative diseases earlier and develop more effective therapies to combat them," explained Pedro Ramos, head researcher of the aforementioned research group.

This is a preclinical research project applied in animal models of aging and in models of neurodegenerative diseases; it is based on the use of functional neuroimaging techniques, which will be carried out entirely in the Magnetic Resonance Imaging Lab. "As this will be conducted using non-invasive functional imaging techniques, we hope that the new diagnostic and therapeutic techniques emerging from our research will be directly transferable to the clinical setting in the near future," said the Ikerbasque research professor. In this work, Dr David Otaegui of the Multiple Sclerosis group at the Bionostia Health Research Institute will be collaborating with CIC biomaGUNE.

The grants awarded through the GIPUZKOA NEXT program run by the Charter Provincial Council of Gipuzkoa seek to support centers in the Basque Science, Technology and Innovation Network of Gipuzkoa as they develop R&D projects geared towards the lines included in the Euskadi Next Basque Recovery and Resilience Program for recovery, transformation and resilience, which aims to promote, strengthen and take advantage of synergies generated in

these areas. The 2022 call has focused on the field of cognitive impairment prevention and is directly related to the Adinberri strategy, which aims to achieve healthier aging.

About CIC biomaGUNE

The Center for Cooperative Research in Biomaterials CIC biomaGUNE, member of the Basque Research and Technology Alliance ([BRTA](#)), conducts state-of-the-art research at the interface between Chemistry, Biology and Physics, devoting particular attention to studying the properties of biological nanostructures on a molecular scale and their biomedical applications. It was recognized in 2018 as a “María de Maeztu” Unit of Excellence for meeting requirements of excellence, which are characterized by a high impact and level of competitiveness in its field of activity on the global scientific stage.

Image caption: Image illustrating the MIELIMAGEN project. Myelin is the substance that surrounds and protects the axons of neurons. The insets at the bottom are MRI images of the brains of two mice displaying the difference between healthy neurons, protected by myelin (left inset), and damaged neurons, lacking myelin (right inset). Top left, a Magnetic Resonance Imaging machine and, top right, a functional image showing an active neural network in a mouse brain. (Pedro Ramos-Cabrer / CIC biomaGUNE).