Carmen Ruiz de Almodóvar

TACKLE-CSVD

Targeting autophagic networks and the lysosome in cerebral small vessel disease

Project Coordinator:
Carmen Ruiz de Almodóvar, Institute for Neurovascular Cell Biology, University Hospital Bonn, University of Bonn, Bonn, Germany

Project Partners:
Karina Yaniv, Department of Immunology and Regenerative Biology, Weizmann Institute of Science, Rehovot, Israel

Ainhoa Plaza Zabala, Dept Pharmacology, University of the Basque Country - UPV/EHU, Spain

Gabor Petzold, German Center for Neurodegenerative Diseases (DZNE), Bonn, Germany

Cerebral small vessel disease (CSVD) is caused by dysfunction of small blood vessels particularly in a part of the brain called the white substance, in which nerve cells are enwrapped by an insulating sheath called myelin that is produced by cells called oligodendrocytes. CSVD causes a breakdown of myelin, but the reasons for this are unclear. We hypothesize that CSVD does not only arise from defects in blood vessels of the brain, but that oligodendrocyte dysfunction contributes to initiation and progression of the disease. This project will answer the question of what is the role of oligodendrocytes in CSVD. A particular focus will be on lysosomes, which are cellular organelles that allow cells to degrade and recycle their components, but which we hypothesize to be perturbed in oligodendrocytes, leading to their dysfunction.

In this project, we will characterize at the cellular and molecular level how oligodendrocyte dysfunction contributes to CSVD pathology. We expect to gain a deeper understanding of the molecular mechanisms contributing to the dysfunction of lysosomes in oligodendrocytes and the development of the disease. Through this, we aim to identify molecules that can be tested as new targets for potential therapies.