



Professor Alfredo Ramirez

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The main objective of Professor Ramirez's laboratory is the identification of the genetic and epigenetic causes of cognitive disorders such as Alzheimer's disease. His group has created the basis for research on the genetics and epigenetics of prodromal Alzheimer's disease and its progression through the creation of international collaborations. In this context, Professor Ramirez has been able to collect large genetic and epigenetic data sets in the context of international consortia dedicated to the genetics of neurodegeneration.

He is an active member of the steering committee of the largest European consortium in Alzheimer's disease genetics, the "European DNA Bank for deciphering the missing heritability of Alzheimer's disease" (EADB consortium). Within the EADB, Professor Ramirez has genotyped more than 14,000 DNA samples collected from different centers in Germany, Europe, and South America. The investigation of candidate genes for Alzheimer's disease in this sample has already led Professor Ramirez to important findings that have been published in leading international peer-reviewed journals.

In 2016, he started the division of Neurogenetics and Molecular Psychiatry in the Department of Psychiatry at the University of Cologne expanding his research area to the molecular biology of aging as a major risk factor for Alzheimer's disease. His division has been specifically interested in cellular senescence as one of the fundamental processes occurring during aging. In this regard, Professor Ramirez's team has explored whether the levels of specific proteins in cerebrospinal fluid belonging to the so-called senescence-associated secretory phenotype (SASP) are associated with accelerated biological aging and whether this acceleration influences the progression to Alzheimer's type dementia. This work has already led to the identification of a SASP protein, matrix metalloproteinase 10, as an independent age-related biomarker that informs progression along the Alzheimer's disease continuum.