

A new study identifies key genes related with human brain aging

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- The research aims to understand how the aging process affects each person, as well as to identify the regulatory genes that can affect the biological age.

This new study, carried out after the collection and integration of more than 2000 samples from four international research projects, has identified an important group of genes in our brain that are affected by age throughout life (from children aged 5-10 years, to adults and the elderly up to 90-100 years). The samples, from biopsies of healthy donors, belong to the cerebral regions of cortex, hippocampus and cerebellum. The analysis found altered the functions related with response to cellular stress, immune system, synapse, neurotransmission and the signaling pathway associated with calcium. In addition, when studying the genes associated with the cellular types of the central nervous system, a loss of signal was found in neuronal activity, which would mark the cognitive deterioration associated with aging or the passage of age in a normal non-pathological way. This result is relevant for studies that the Bioinformatics and Functional Genomics group of CIC-IBMCC is conducting on neuro-pathologies and dementias such as Alzheimer's, in which the affected genes may be others. The global study has also managed to identify possible regulatory genes that orchestrate the genetic signature of brain aging.

Finally, researchers have used an artificial intelligence algorithm, developed entirely by the research team, to calculate using this genetic signature obtained a bio-age associated with each individual, in order to better understand how the process affects individually of aging for each person, as well as the possible factors that may affect this biological age.

The study was carried out by the Bioinformatics and Functional Genomics group of the Cancer Research Center (CIC-IBMCC) in collaboration with the cell growth and regeneration group of the University of Paris (Université Paris Est Créteil (UPEC)).

Link paper: <https://doi.org/10.1016/j.bbagrm.2020.194491>

Transcriptomic landscape, gene signatures and regulatory profile of aging in the human brain

BBA - Gene Regulatory Mechanisms
