

Researchers corroborate the neuroprotective effects of Sirtuin 1 activation on mice with Alzheimer's disease

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A study coordinated by the University of Barcelona (UB) has described a mechanism that plays a key role in the evolution of Alzheimer's disease. According to the paper published in the *Journal of Alzheimer's Disease*, the activation of the protein Sirtuin 1 in a murine model with familial Alzheimer's disease has neuroprotective effects. The study, based on the PhD thesis developed by the researcher David Porquet (UB), first describes Sirtuin 1 pathway in this murine model. Mercè Pallàs, from the Department of Pharmacology and Therapeutic Chemistry at the Faculty of Pharmacy of UB, coordinates the study. The Bellvitge Biomedical Research Institute (IDIBELL) and the August Pi i Sunyer Biomedical Research Institute (IDIBAPS) also collaborate in the study.

A group of mice was fed with resveratrol, a natural polyphenolic compound found in grapes and red wine. Mice were modified to develop familial Alzheimer's disease, an inherited [neurodegenerative disorder](#) that represents 5% of dementia cases and normally has an early onset. Resveratrol dose was equivalent to dietary supplementation and administered for 10 months. Then, its effects on cognitive function and neuronal tissues were compared with a control group that did not receive any supplementation. "Results showed that resveratrol ameliorated short-term memory and stopped the accumulation of senile plaques and the development of tau protein, the two most important characteristics of the disease", explains Mercè Pallàs, researcher from the Research Group on Aging and Neurodegeneration of UB and the Centre for Networked

Biomedical Research on Neurodegenerative Diseases (CIBERNED).

Researchers studied which mechanisms are activated in this process. Particularly, they focused their attention on Sirtuin 1, a protein involved in ageing. "We used resveratrol because it is thought that one part of its beneficial effects is due to an increase in sirtuin activity". "Although sirtuin protein levels decreased —she adds—, its activity was increased". Surprisingly, the study showed an increase in other intracellular mechanisms. Therefore, "resveratrol's beneficial action increases these other mechanisms and mitochondrial function", concludes the researcher.

According to Pallàs, "sirtuin pathway may be a good Alzheimer's disease treatment target. The study proves that if this pathway is regulated, in this case with resveratrol, the evolution of Alzheimer's disease in this murine model of familial Alzheimer's disease is modified".

Sirtuin and ageing

A previous study developed by the research group had already proved the important role that Sirtuin 1 plays in ageing. "We administered the same type of resveratrol treatment to mice with accelerated senescence —modified to get older quicker— and we observed an increase of their life expectancy which was related to sirtuin activation", points out Pallàs.

Further studies need to be conducted to elucidate whether or not resveratrol is also able to protect against mitochondrial dysfunction. "If we corroborate the key role played by mitochondria-sirtuin interaction, the activation of sirtuin with resveratrol might have protective effects on high-fat diet-fed mice, which are supposed to suffer mitochondrial dysfunction", says the researcher.

More information: "Neuroprotective Role of Trans-Resveratrol in a

Murine Model of Familial Alzheimer's Disease." David Porquet, Christian Griñán-Ferré, Isidre Ferrer, Antoni Camins, Coral Sanfeliu, Jaume del Valle, Mercé Pallás. *Journal of Alzheimer's Disease*. [DOI: 10.3233/JAD-140444](https://doi.org/10.3233/JAD-140444)

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