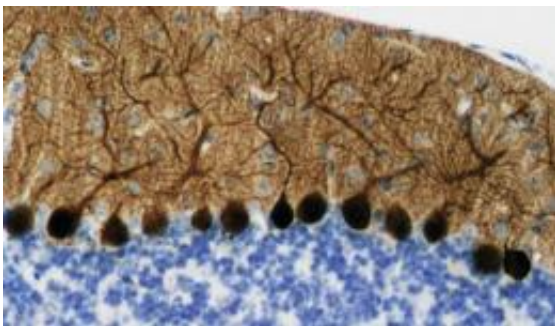


Glycogen accumulation in neurons causes brain damage and shortens the lives of flies and mice

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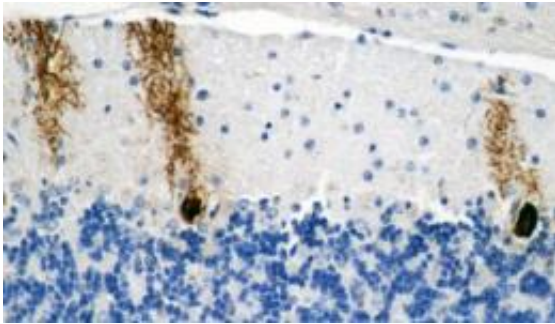


This image shows a cerebellum sample from a healthy mouse. Credit: Jordi Duran (IRB Barcelona)

Collaborative research by groups headed by scientists Joan J. Guinovart and Marco Milán at the Institute for Research in Biomedicine (IRB Barcelona) has revealed conclusive evidence about the harmful effects of the accumulation of glucose chains (glycogen) in fly and mouse neurons.

These two animal models will allow scientists to address the genes involved in this harmful process and to find pharmacological solutions that allow disintegration of the accumulations or limitation of [glycogen](#) production. Advances in this direction would make a significant contribution to investigation into Lafora progressive myoclonic epilepsy

and other neurodegenerative diseases characterized by glycogen accumulation in [neurons](#). The journal *EMBO Molecular Medicine* publishes the results of the study this week.



This image shows the same tissue (mouse cerebellum) after glycogen accumulation. Credit: Jordi Duran (IRB Barcelona)

"Our data clearly indicate that glycogen accumulation alone kills neurons and thus dramatically reduces lifespan", explains Guinovart, an expert in glycogen metabolism, group leader at IRB Barcelona, and senior professor at the University of Barcelona, "because the only thing we have manipulated in the neurons is their capacity to produce glycogen".

The inclusion of the *Drosophila* fly in the study provides in vivo confirmation of the theory in another animal model as these flies also show the same symptoms of degeneration as mice when glycogen accumulates in neurons. However, in addition the use of *Drosophila* will speed up obtaining genetic data and the screening of therapeutic molecules. "In a short time we will be able to perform a massive search for genes involved in the pathological process and to understand it better at the molecular level", emphasizes Marco Milán, ICREA researcher at IRB Barcelona and a specialist in *Drosophila*. "But the flies will also be useful to identify pharmacological molecules that can cure", he explains.

The IRB Barcelona teams are designing several experiments to identify the possible therapeutic targets that may be useful to prevent glycogen accumulation in neurons. In addition to the direct relation to Lafora epilepsy, a progressive degenerative disease that affects adolescents and has no cure, glycogen accumulation could be the main cause of other neurodegenerative illnesses such as Adult polyglucosan body disease and Andersen's disease.

Provided by Institute for Research in Biomedicine (IRB Barcelona)

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