Scientists discover a new protein critical for mitochondria

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On the right side we can see aberrant fly and mitochondria when SLIMP is silenced. Credit: Tanit Guitart. IRB Barcelona

A study by the team headed by Lluís Ribas de Pouplana, ICREA professor at the Institute for Research in Biomedicine (IRB Barcelona), has been chosen as "Paper of the week" in the December issue of the *Journal of Biological Chemistry*, which is already available online. The article describes the discovery of a new protein in the fly *Drosophila melanogaster* (fruit fly) that is crucial for mitochondria. The removal of SLIMP in these flies leads to aberrant mitochondria and loss of metabolic capacity, thus causing death.

The study, whose first author is Tanit Guitart, a PhD student in Ribas' lab, has been recognised as "Paper of the week" award because of the "significance and global relevance" of the research performed. Furthermore, the editors have included it among the best studies that have appeared in the journal this year. Of the 6600 articles published, only between 50 and 100 receive the distinction of "Article of the week".

Result of animal evolution

The SLIMP protein derives from a seryl-tRNA synthetase, universal enzymes that are crucial for the synthesis of new proteins. However, SLIMP has lost its original function and performs a different biological role, which remains to be determined. The researchers studied its possible implication in the regulation of mitochondrial division and the interaction with nucleic acids (DNA, RNA).

SLIMP evolved by duplication of the seryl-tRNA synthetase about 540 million years ago, at the beginning of the Cambrian, before the appearance of the starfish and sea urchins family. SLIMP is not present in vertebrates, and it is possible that another protein has taken over its function. "If this were the case, we could look for the protein equivalent in vertebrates, determine its function and focus on these organisms. Here we have work for the next ten years", says Ribas. This study was performed in collaboration with researchers in the groups devoted to "Heterogenic and Multigenic Diseases" and "Chromatin structure and function", both at IRB Barcelona.

More information: A new aminoacyl-tRNA synthetase-like protein in insecta with an essential mitochondrial function Tanit Guitart, Teresa Leon Bernardo, Jessica Segalés, Thomas Stratmann, Jordi Bernués and Lluís Ribas de Pouplana *Journal of Biological Chemistry* (2010). DOI:10.1074/jbc.M110.167486

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