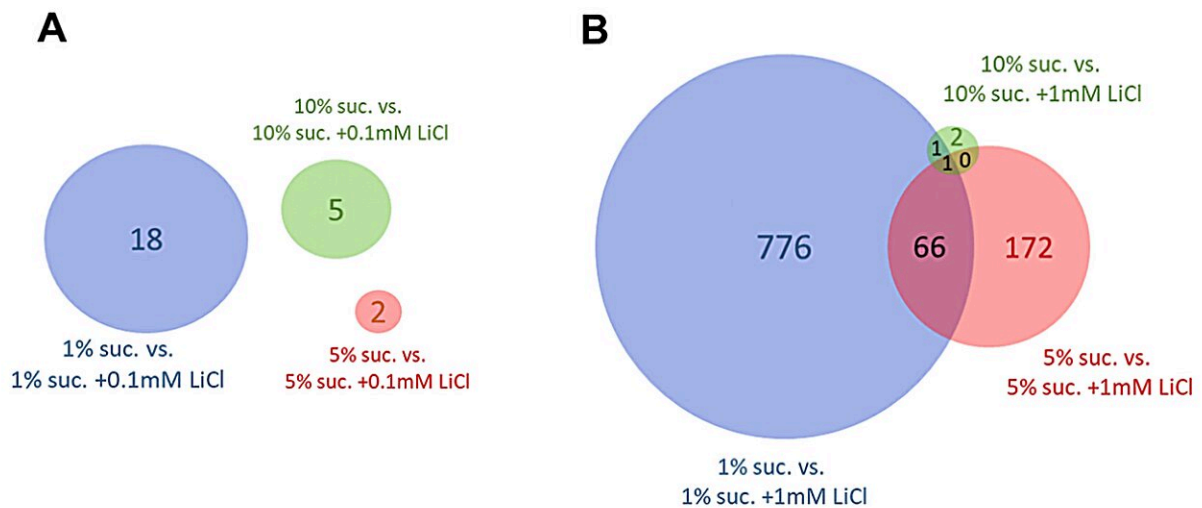


Dietary sucrose determines activity of lithium on gene expression and lifespan in *D. melanogaster*

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Dietary sucrose determines the regulatory activity of lithium on gene expression and lifespan in *Drosophila melanogaster*. Credit: 2024 Jans et al.

The amount of dietary sugars and the administration of lithium both impact the lifespan of the fruit fly *Drosophila melanogaster*. It is noteworthy that lithium is attributed with insulin-like activity as it

stimulates protein kinase B/Akt and suppresses the activity of glycogen synthase kinase-3 (GSK-3). However, its interaction with dietary sugar has largely remained unexplored.

In a new study, researchers Katharina Jans, Kai Lüersen, Jakob von Frieling, Thomas Roeder, and Gerald Rimbach from the University of Kiel investigated the effects of lithium supplementation on known lithium-sensitive parameters in [fruit flies](#), such as lifespan, body composition, GSK-3 phosphorylation, and the transcriptome, while varying the [dietary sugar](#) concentration.

The research paper, "Dietary sucrose determines the regulatory activity of lithium on [gene expression](#) and lifespan in *Drosophila melanogaster*," is [published](#) in the journal *Aging*.

"Based on this proposed overlapping bioactivity of dietary sugar and lithium in the female fruit fly, we decided to investigate the extent of these similarities and whether a joint mechanism lies at their root."

For all these parameters, the researchers observed that the efficacy of lithium was significantly influenced by the sucrose content in the diet. Overall, they found that lithium was most effective in enhancing longevity and altering [body composition](#) when added to a low-sucrose diet.

Whole-body RNA sequencing revealed a remarkably similar transcriptional response when either increasing dietary sucrose from 1% to 10% or adding 1 mM LiCl to a 1% sucrose diet, characterized by a substantial overlap of nearly 500 differentially expressed genes.

"Hence, dietary sugar supply is suggested as a key factor in understanding lithium bioactivity, which could hold relevance for its therapeutic applications."

More information: Katharina Jans et al, Dietary sucrose determines the regulatory activity of lithium on gene expression and lifespan in *Drosophila melanogaster*, *Aging* (2024). [DOI: 10.18632/aging.205933](https://doi.org/10.18632/aging.205933)

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