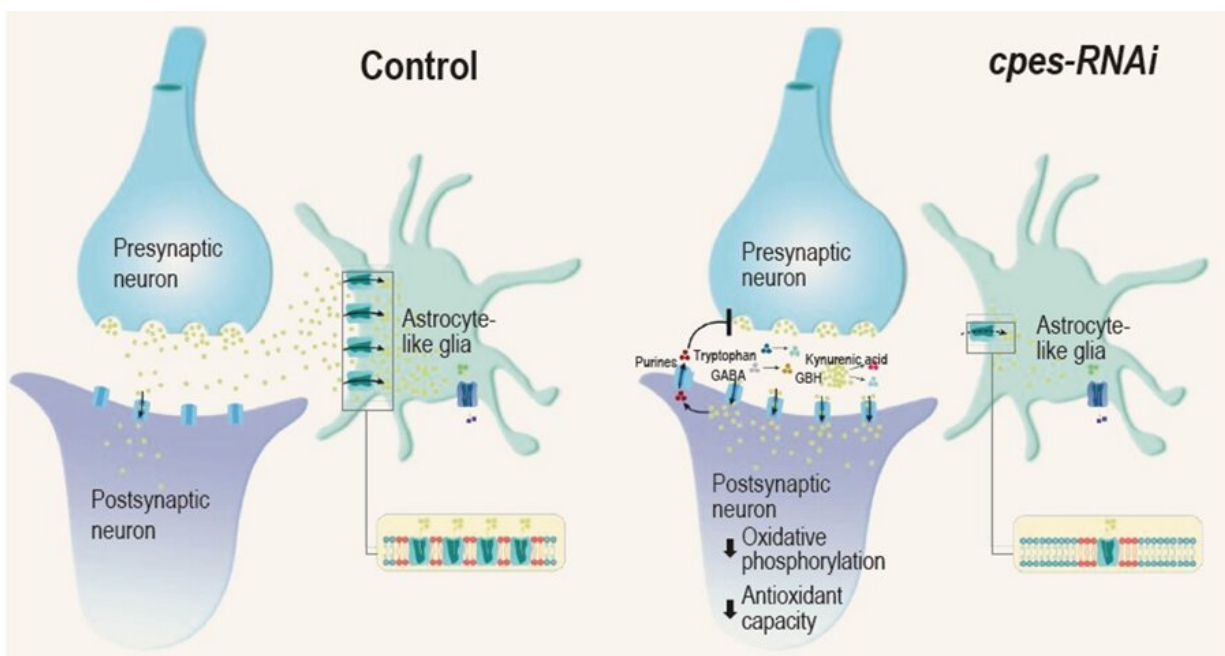


# Endogenous ceramide phosphoethanolamine modulates circadian rhythm and longevity in *Drosophila*

August 4 2022, by ZHANG Nannan



Schematic model of aberrant transynaptic glutamate signaling under glial-specific *cpes* knockdown compared to control condition. Credit: IGDB

The circadian clock entrains rhythmic patterns in behavioral and physiological processes to temporally coordinate systemic metabolism with the rising and setting of the sun. In previous investigation on human subjects, sphingomyelins (SMs) exhibited strong rhythmicity on an

individual basis. However, the mechanistic connection between SM and circadian regulation remains unclear.

In a recent study published in *Nature Science Review*, Prof. Shui Guanghou's team from the Institute of Genetics and Developmental Biology (IGDB) of the Chinese Academy of Sciences presented new findings pertaining to how endogenous ceramide phosphoethanolamine modulate circadian rhythm and longevity via neural-glia coupling in *Drosophila*.

The researchers investigated whether ceramide phosphoethanolamine (CPE, structural analog of SM) affects the maintenance of [circadian clock](#) by employing the CRISPR/Cas9 technology to construct various mutants of genes implicated in the biosynthesis and metabolism of CPE in *Drosophila*.

They confirmed that CPE was essential for the maintenance of circadian rhythm and that CPE deficiency could lead to rhythm disorders and shorten lifespan, while increasing CPE or SM restored the rhythm and greatly extended lifespan of *Drosophila*. Multi-omics analyses revealed that the reduction of CPE led to abnormal glial glutamate signaling and disruption of circadian rhythms in *Drosophila*.

These findings demonstrate that CPE or SM production in astrocyte-like glia (ALG) modulates circadian rhythm in locomotor activity and lifespan in *Drosophila*. It would be very interesting and valuable to further study whether maintaining levels of CPE or SM in ALG could extend the lifespan of mice or primates.

**More information:** Xiupeng Chen et al, Endogenous ceramide phosphoethanolamine modulates circadian rhythm via neural-glia coupling in *Drosophila*, *National Science Review* (2022). [DOI: 10.1093/nsr/nwac148](https://doi.org/10.1093/nsr/nwac148)

Provided by Chinese Academy of Sciences

Citation: Endogenous ceramide phosphoethanolamine modulates circadian rhythm and longevity in *Drosophila* (2022, August 4) retrieved 26 April 2024 from

<https://phys.org/news/2022-08-endogenous-ceramide-phosphoethanolamine-modulates-circadian.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.