

Amino acid in fruit fly intestines found to regulate sleep

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Drosophila melanogaster. Credit: Wikipedia/CC BY-SA 2.5

A team of researchers affiliated with several institutions in China has found that an amino acid made in fruit fly intestines plays a key role in regulating their sleep. In their paper published in the journal *Nature Communications*, the group describes their study of D-serine in *Drosophila melanogaster* and what they found.

Scientists have known about D-serine for many years, but thought that it

only existed in bacteria. Recently, however, researchers found that humans also produce the amino acid, as do fruit flies. But until now, it was not known what function it served. In this new effort, the researchers found that, at least in [fruit flies](#), it helps regulate [sleep](#).

To learn more about the amino acid, the researchers edited the genes of fly specimens to halt its production and found that doing so resulted in the flies sleeping only half as much as normal flies. But they also found something else. Fruit flies actually produce D-serine in two places—in their intestines and their brains. Logic would suggest that the acid produced in the brain would be the one associated with sleep, but the researchers found that the opposite was true. When they turned off the genes that controlled production of the enzyme, serine racemase, which synthesizes D-serine in the intestines, the flies slept less, but when they did the same for those made in the brain, they saw no change in sleep habits.

The researchers report that they have no idea how an amino acid produced in the intestines can impact sleep patterns, noting that sleep regulation is probably carried out by the central nervous system. Prior research has shown that sleep is a very old evolutionary development, which suggests its control is likely similar across species. They suggest that more research is needed to find the answers to other questions surrounding D-serine—for instance, is it produced in other parts of the body? Does it play a role in regulating sleep in humans, and if so, how?

More information: D-Serine made by serine racemase in *Drosophila* intestine plays a physiological role in sleep, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-09544-9](https://doi.org/10.1038/s41467-019-09544-9) , www.nature.com/articles/s41467-019-09544-9

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