

# Cells in the retina light the way to treating jet lag

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Credit: Vera Kratochvil/public domain

Researchers have found a new group of cells in the retina that directly affect the biological clock by sending signals to a region of the brain which regulates our daily (circadian) rhythms. This new understanding of how circadian rhythms are regulated through the eye could open up new therapeutic possibilities for restoring biological clocks in people who have jet lag through travelling or working night shifts.

Biological clocks are synchronized to light-dark changes and are important to regulate patterns of body temperature, brain activity, hormone production and other physiological processes. Disruption of this can lead to health problems such as gastrointestinal and cardiovascular disorders, depression and an increased risk of cancer.

The suprachiasmatic nucleus (SCN) is a region of the brain which co-ordinates the circadian [rhythm](#) using many different signalling molecules, including the neurohormone vasopressin. The [retina](#) signals environmental light changes to the SCN but it was previously unclear on how this process took place. This research shows for the

first time that the retina has its own population of vasopressin-expressing cells which communicate directly to the SCN and are involved with regulating the circadian rhythm. This gives an insight into how the [biological clock](#) is regulated by light and could open up new therapeutic opportunities to help restore altered circadian rhythms through the eye.

The researchers interfered with the signalling of light information sent to the SCN in rats. Using a series of physiological tests, they showed that vasopressin-expressing cells in the retina are directly involved in regulating circadian rhythms.

Mike Ludwig, Professor of Neurophysiology at The University of Edinburgh and lead investigator of the study said 'Our exciting results show a potentially new pharmacological route to manipulate our internal biological clocks.'

He added 'Studies in the future which alter vasopressin signalling through the eye could lead to developing eye drops to get rid of jet lag, but we are still a long way off from this.'

The full study, Vasopressin casts [light](#) on the [suprachiasmatic nucleus](#), is published in the *Journal of Physiology*.

**More information:** Takahiro Tsuji et al, Vasopressin casts light on the suprachiasmatic nucleus, *The Journal of Physiology* (2017). [DOI: 10.1113/JP274025](#)

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