

Brain cell changes may cause sleep troubles in aging

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Older animals show cellular changes in the brain "clock" that sets sleep and wakeful periods, according to new research in the April 25 issue of *The Journal of Neuroscience*. The findings may help explain why elderly people often experience trouble sleeping at night and are drowsy during the day.

Like humans, mice experience shifts in daily activities and [sleep patterns](#) as they age. To find out why, researchers directed by Johanna Meijer, PhD, at the Leiden University Medical Center in the Netherlands studied the electrical activity of cells in the [suprachiasmatic nucleus](#) (SCN), an area of the brain responsible for setting sleep-wake cycles.

Consistent with previous studies, the researchers found aged mice showed disrupted sleep behavior and weakened brain network activity in the SCN. But Meijer and colleagues also found changes occurring in individual SCN cells, not just in their networks.

"In fact, the changes at the single-cell level were more severe than the changes at the network level," said Meijer. This represents a shift in understanding of aging's effects on the brain.

The researchers made electrophysiological recordings from isolated SCN neurons, a difficult experiment given the advanced age of the animals and the small size of this type of neuron. They found aged SCN neurons lack day-night rhythms in some membrane properties. In addition, the team identified age-related reductions of certain potassium currents that

are important to the neurons' rhythmic firing.

Because potassium and other [ion channels](#) can be manipulated with drugs, "This work provides a new target for potential therapeutic interventions that can mitigate the age-related decline in the sleep-wake cycle," said Christopher Colwell, PhD, an expert in circadian clock function at the University of California, Los Angeles, who was not involved in the study.

Provided by Society for Neuroscience

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