

In Sleep, We Are Birds of a Feather

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Did you sleep like a baby last night? You might think so, but actually you slept like a bird.

Or rather, a bird slept like you. One bird, in particular — the zebra finch, which researchers say has a sleep structure very much like that of people and other mammals.

Philip Steven Low of the Salk Institute for Biological Studies in San Diego, Calif., and colleagues report in [The Proceedings of the National Academy of Sciences](#) that electroencephalograms of the songbirds show they have episodes of rapid-eye-movement sleep and slow-wave sleep as well as transition stages and quick spikes, all reminiscent of mammalian sleep patterns.

It's the first time that this complete group of sleep characteristics has been found outside of mammals — a surprising finding, Dr. Low said, because birds lack a neocortex, the part of the mammalian brain thought necessary for such patterns.

Indeed, although scientists have wanted to study sleep in songbirds because of evidence that sleep played a role in song learning, the lack of a neocortex has hampered efforts to do so; it has been difficult to pick up the proper electrical signals from bird brains. Dr. Low experimented with moving the EEG electrodes around the brain until he found a suitable spot. "The key to this is not unlike California real estate," he said. "Location, location, location."

He also devised an algorithm to analyze the signals. "It's pointless to look at this data second by second," Dr. Low said. "I had to come up with a mathematical way to understand the brain activity."

The algorithm produces multidimensional grids that reveal the structure, he said. One goal is to use similar algorithms to be able to detect structural changes in the sleep of people with neurological disorders — "to use sleep as a microscope for brain activity," Dr. Low said.

As for the zebra finch results, he said, they show that a cortex isn't required to have such structured sleep, and they also raise evolutionary issues. "The question now becomes whether evolution has gone through the trouble of selecting for these particular patterns

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more than once," he said.

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