

## News &amp; Comments

## The Brain Remains Sensitive to Sound During Sleep

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According to a study of the cerebral cortex, the brain's response to sound during sleep closely resembles its response during wakefulness. Sleep, however, lacks differences in brain waves that aid the brain in understanding sound and anticipating what will happen next. Scientists discovered that even when you are asleep, some parts of the brain (responsible for hearing) are still working. To make their findings, the team of scientists studied brain activity in the cerebral cortex of epilepsy patients. A strong brain's response to sound was observed during sleep just like the one we get during wakefulness the difference of alpha-beta waves. This attenuation of the waves indicates that higher brain centers are providing neural feedback to the awake state. Sleep was lacking this factor. By implanting electrodes in patients with severe epilepsy, researchers were able to examine the activity of single brain cells up-close to identify where seizures were occurring for potential cures. To make the findings, the team of scientists collected data from over 700 neurons during wakefulness and different stages of sleeping and compared it with the neuronal activity and brain waves. They found that A decrease in the "top-down" neural feedback that mediates attention and expectation was observed in the primary auditory cortex during sleep. According to Dr. Itzhak Fried, a study co-author, "That's probably why we are still not conscious, although we are still processing sensory information from the external world. So, you're not completely shut off from the environment in that sense." "Our findings have wide implications beyond this specific experiment," says neuroscientist Yuval Nir. "In future research, we intend to further explore the mechanisms responsible for this difference." Dr. Fried has done extensive research on the brain's activity during wake and sleep and believes that in people who are unconscious, like comatose patients or those under anesthesia, the findings could help us understand how information is processed. Also, auditory stimulation may enhance memory during sleep when the brain consolidates information from the day.

### KEYWORDS

Sensory processing, Sleep, auditory neuroscience, brain research, cerebral cortex, music, neurobiology, neuroscience, sleep, UCLA

