

These carbon dioxide-sensing neurons wake up mice

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Stimulating a population of neurons in the midbrain with carbon dioxide (CO₂) awakens adult male mice without enhancing breathing, finds a study published in *JNeurosci*. These findings are relevant to understanding disorders such as obstructive sleep apnea, sudden infant death syndrome and sudden unexpected death in epilepsy.

Rising levels of CO₂ trigger the drive to breathe, and cause arousal from sleep. Disorders that interfere with this important signal can disrupt sleep and, in some cases, lead to death. The mechanism by which CO₂ causes arousal from sleep—a reflex critical to survival—is not well understood.

Gordon Buchanan and colleagues demonstrate that activation of [serotonin neurons](#) in the midbrain dorsal raphe nucleus (DRN) with CO₂-saturated, artificial cerebrospinal fluid woke up sleeping mice. Activation of similar neurons in the medulla, on the other hand, increased breathing but did not wake the mice up. The study identifies a direct pathway through which CO₂ induces arousal independent of changes in breathing.

More information: Dorsal raphe serotonin neurons mediate CO₂-induced arousal from sleep, *JNeurosci* (2018). [DOI: 10.1523/JNEUROSCI.2182-17.2018](https://doi.org/10.1523/JNEUROSCI.2182-17.2018)

Provided by Society for Neuroscience

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