Caffeine

[Updated 2025-February-24]

This documents how caffeine works and tips on its use.

> Caffeine works by successfully battling with adenosine for the privilege of latching on to adenosine welcome sites—or receptors—in the brain. Once caffeine occupies these receptors, however, it does not stimulate them like adenosine, making you sleepy. Rather, caffeine blocks and effectively inactivates the receptors, acting as a masking agent. It's the equivalent of sticking your fingers in your ears to shut out a sound. By hijacking and occupying these receptors, caffeine blocks the sleepiness signal normally communicated to the brain by adenosine. The upshot: caffeine tricks you into feeling alert and awake, despite the high levels of adenosine that would otherwise seduce you into sleep.

Walker, Matthew. Why We Sleep: Unlocking the Power of Sleep and Dreams (p. 27). (Function). Kindle Edition.

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Caffeine then wears off, but the rate at which it does so depends on the individual. Some people have genetics predisposing them to quick elimination, whereas others take much longer. The rate decreases as we age; caffeine maintains a more extended grip.

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> We now understand why. For the entire time that caffeine is in your system, the sleepiness chemical it blocks (adenosine) nevertheless continues to build up. Your brain is not aware of this rising tide of sleep-encouraging adenosine, however, because the wall of caffeine you've created is holding it back from your perception. But once your liver dismantles that barricade of caffeine, you feel a vicious backlash: you are hit with the sleepiness you had experienced two or three hours ago before you drank that cup of coffee plus all the extra adenosine that has accumulated in the hours in between, impatiently waiting for caffeine to leave. When the receptors become vacant by way of caffeine decomposition, adenosine rushes back in and smothers the receptors. When this happens, you are assaulted with a most forceful

> adenosine-trigger urge to sleep—the aforementioned caffeine crash. Unless you consume even more caffeine to push back against the weight of adenosine, which

Walker, Matthew. Why We Sleep: Unlocking the Power of Sleep and Dreams (pp. 28-29). (Function). Kindle Edition.

Thoughts on consumption

- Don't consume in the afternoon or evening if you want the best sleep