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Here Is What Coffee Actually Does To Your Brain

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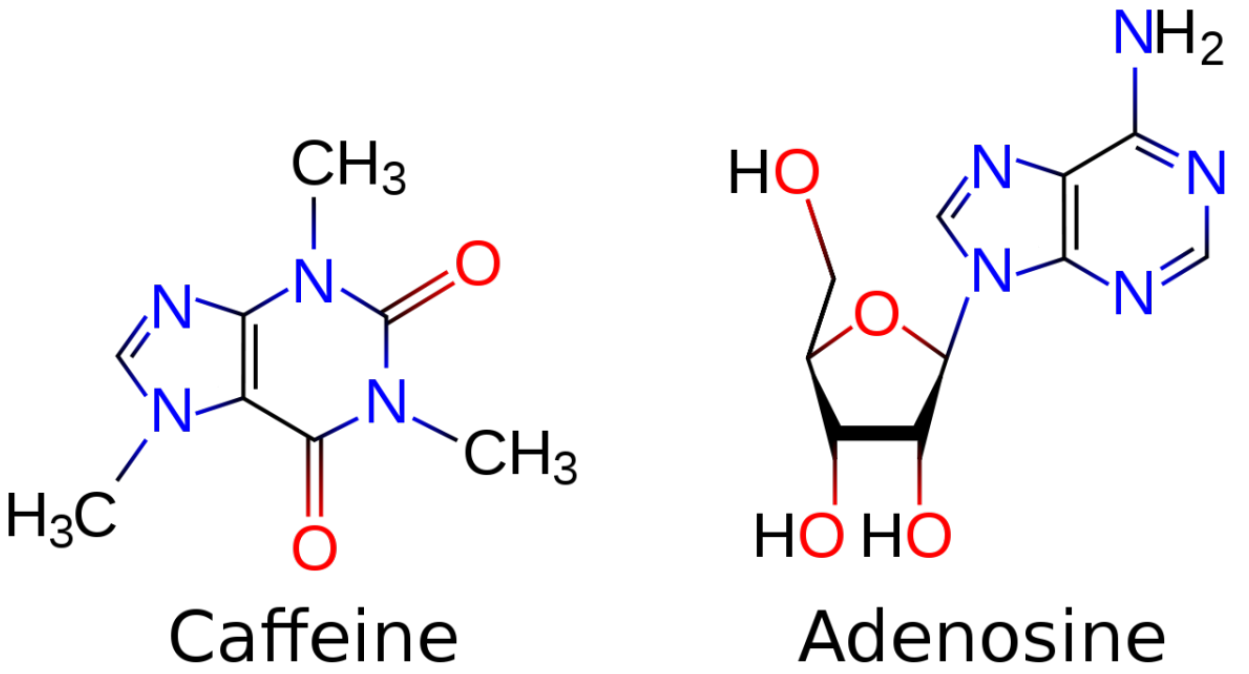
Coffee wakes you up in the morning and keeps you alert throughout the day, but how does its magic ingredient actually work? Mitchell Moffit and Gregory Brown demystify the inner workings of caffeine in their latest ASAP Science video.

The first thing to know is that part of your natural tiredness comes from a molecule called adenosine, which is produced by your body while it chugs along through the day. "While you sleep, the concentration of adenosine declines, gradually promoting wakefulness," the video explains. Meanwhile, the more adenosine that builds up, the sleepier you feel.

Your morning coffee is able to hijack that process because caffeine looks a lot like adenosine to your brain cells:



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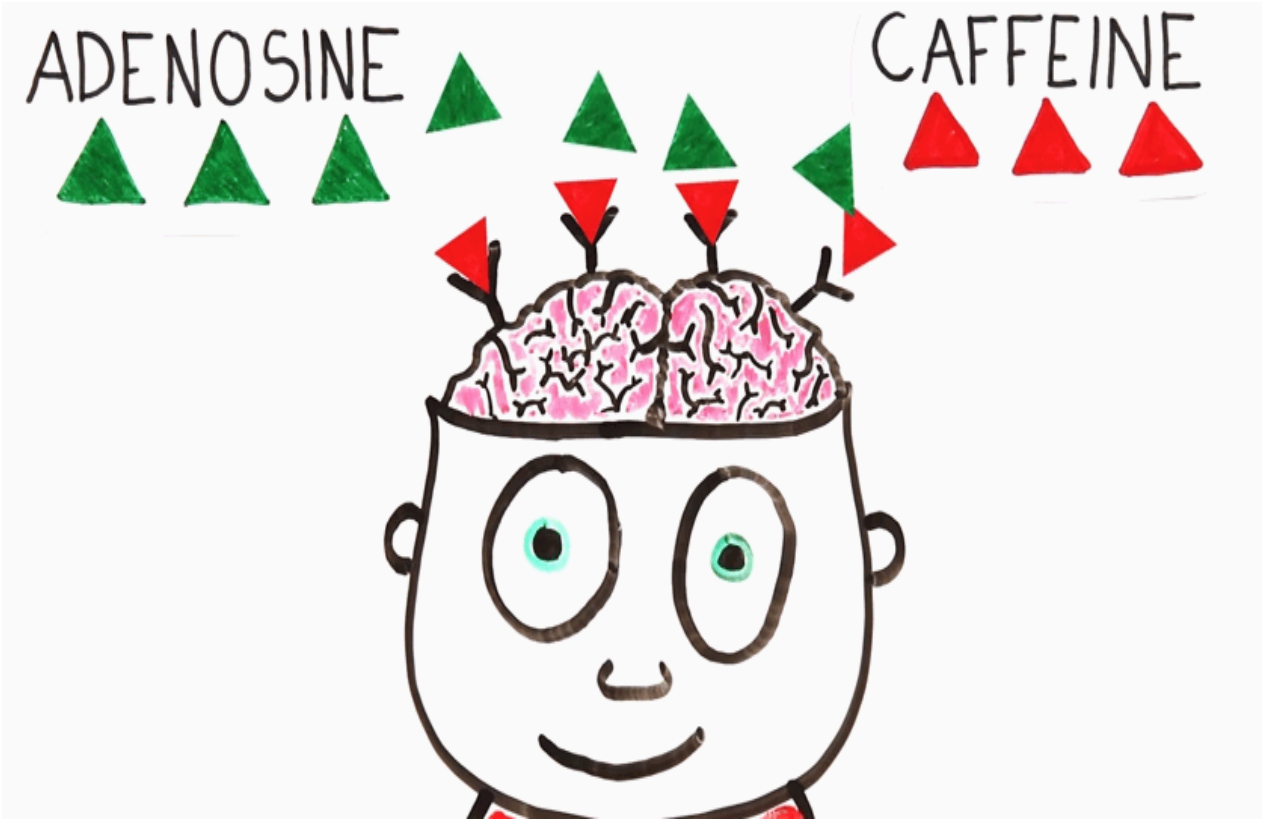
Because of its similar shape, caffeine can bind to the adenosine receptors in your brain. Once the caffeine is locked into adenosine's rightful spot though, there is no way for the adenosine to stick around — which prevents it from building up and making you sleepy.

Without the molecule that usually induces exhaustion, "our natural stimulants run wild," Joseph Stromberg writes in Smithsonian. The result? You feel wide awake — at least for a while.



ASAP Science / YouTube

But all good things must come to an end, and your brain quickly wises up to your tricks.

When the adenosine is continually blocked from binding to its receptors, your body eventually creates *more* receptors — which means you need even more caffeine to plug them up. This can make kicking your coffee habit increasingly difficult, and make you need more and more caffeine to stay alert.

"When you try to quit drinking coffee or miss your daily intake," Moffit and Brown explain, "you might experience some withdrawal symptoms and feel more tired than you would have before you ever drank coffee."

But caffeine does more than just block adenosine. It can also pump up your levels of adrenaline and boost your mood — "the exact same thing cocaine does, just to a lesser degree," the video says.

Watch the full ASAP Science video below.