

# Espresso coffee prevents Alzheimer's tau protein clumping in lab tests

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Whether enjoyed on its own or mixed into a latte, Americano or even a martini, espresso provides an ultra-concentrated jolt of caffeine to coffee lovers. But it might do more than just wake you up. Research now

published in the *Journal of Agricultural and Food Chemistry* shows that, in preliminary in vitro laboratory tests, espresso compounds can inhibit tau protein aggregation—a process that is believed to be involved in the onset of Alzheimer's disease.

Roughly half of all Americans drink coffee every day, and espresso is a popular way to consume it. To "pull" an espresso shot, hot water is forced through finely ground coffee beans, creating a concentrated extract. This is often used as a base for other drinks, including the trendy espresso martini.

Recent research has suggested that [coffee](#) could also have beneficial effects against certain neurodegenerative diseases, including Alzheimer's disease. Although the exact mechanisms that cause these conditions are still unclear, it's thought that a protein called tau plays a significant role.

In healthy people, tau proteins help stabilize structures in the brain, but when certain diseases develop, the proteins can clump together into fibrils. Some researchers propose that preventing this aggregation could alleviate symptoms. So, Mariapina D'Onofrio and colleagues wanted to see if compounds in espresso could prevent tau aggregation in vitro.

The researchers pulled espresso shots from store-bought beans, then characterized their chemical makeup using [nuclear magnetic resonance spectroscopy](#). They chose caffeine and trigonelline, both alkaloids, the flavonoid genistein and theobromine, a compound also found in chocolate, to focus on in further experiments. These molecules, along with the complete espresso extract, were incubated alongside a shortened form of the tau [protein](#) for up to 40 hours.

As the concentration of espresso extract, caffeine or genistein increased, fibrils were shorter and didn't form larger sheets, with the complete extract showing the most dramatic results. Shortened fibrils were found

to be non-toxic to cells, and they did not act as "seeds" for further [aggregation](#).

In other experiments, the researchers observed that [caffeine](#) and the [espresso](#) extract could both bind pre-formed tau fibrils. Although much more research is needed, the team says that their preliminary in vitro findings could pave the way toward finding or designing other bioactive compounds against neurodegenerative diseases, including Alzheimer's.

**More information:** Espresso coffee mitigates the aggregation and condensation of Alzheimer's associated tau protein, *Journal of Agricultural and Food Chemistry* (2023). [DOI: 10.1021/acs.jafc.3c01072](https://doi.org/10.1021/acs.jafc.3c01072)

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