

Even without nudging blood pressure up, high-salt diet hobbles the brain

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A high-salt diet may spell trouble for the brain—and for mental performance—even if it doesn't push blood pressure into dangerous territory, new research has found.

A new study has shown that in mice fed a very [high-salt diet](#), blood flow to the brain declined, the integrity of [blood vessels](#) in the brain suffered, and performance on tests of cognitive function plummeted.

But researchers found that those effects were not, as has long been widely believed, a natural consequence of high [blood pressure](#). Instead, they appeared to be the result of signals sent from the gut to the brain by the immune system.

The study, conducted by researchers at Weill Cornell Medicine in New York, was published Monday in the journal *Nature Neuroscience*.

The research sheds light on a subject of keen interest to scientists exploring the links between what we eat and how well we think, and the mediating role that the immune system plays in

that communication. It suggests that even before a chronic high-salt diet nudges blood pressure up and compromises the health of tiny blood vessels in the brain, the oversalted gut is independently sending messages that lay the groundwork for corrosion throughout that vital network.

In the small intestines of mice, the authors of the new research found that a very high-salt diet prompted an [immune response](#) that boosted circulating levels of an inflammatory substance called interleukin-17. These high levels of IL-17 set off a cascade of chemical responses inside the delicate inner linings of the brain's blood vessels.

The result, in mice fed the high-salt diet: blood supply to two regions crucial for learning and memory—the cortex and hippocampus—slowed markedly. And mental performance slid. Compared to mice fed a diet lower in salt, the maze-running skills of the mice who consumed high-salt levels faltered, and they failed to respond normally to whisker stimulation, or a new object in their cage.

In mice, that evidence of cognitive impairment was apparent even in the absence of [high blood pressure](#).

The good news—for these mice at least: that when the high-salt diet was discontinued, or when the immune signals were tamped down by drugs, the cognitive performance of [mice](#) was restored.

The immune system's role in sending signals between brain and gut is also seen in such diseases as multiple sclerosis, rheumatoid arthritis, psoriasis and inflammatory bowel disease—all disorders that are linked to poor functioning of the brain's [blood vessels](#). The researchers suggested that if a drug or therapy could disrupt the inflammatory signals that reach the [brain](#), the heart and stroke risk that come with such diseases might be reduced.

More information: Giuseppe Faraco et al. Dietary salt promotes neurovascular and cognitive dysfunction through a gut-initiated TH17 response, *Nature Neuroscience* (2018). [DOI: 10.1038/s41593-017-0059-z](https://doi.org/10.1038/s41593-017-0059-z)

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