

Scientists create device that can isolate blood flow to brain

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An experimental device that isolates blood flow to the brain has the

potential to revolutionize brain research. The device redirects the brain's blood supply through a pump that maintains or adjusts a range of variables necessary to maintain the organ, including blood pressure, temperature, oxygenation and nutrients, researchers report.

When tested on a pig brain, the device maintained [brain activity](#) and health over a five-hour period, researchers at UT Southwestern Medical Center found. The device could lead to new ways to study the [human brain](#) without influence from other bodily functions, researchers said.

"This novel method enables research that focuses on the brain independent of the body, allowing us to answer physiological questions in a way that has never been done," Dr. Juan Pascual, a professor of neurology, pediatrics, and physiology at UT Southwestern, said in a medical center news release.

The findings were published recently in the journal [Scientific Reports](#).

Researchers have already used the system to better understand the effects of low blood sugar in the absence of other factors.

Although scientists can induce low blood sugar in lab animals by restricting food intake or dosing them with insulin, the body can compensate by altering metabolism and cloud the results. This new device allows researchers to directly alter the blood sugar pumped into the brain.

The device also could lead to improvements to the machines used during heart bypass operations to replicate natural [blood flow](#) to the brain, Pascual said.

Bypass devices replicate some functions of the heart and lungs, like keeping blood oxygenated and flowing. But the devices provide a

continuous flow, whereas this new gadget provides a pulsing flow similar to that of the human heart beat—a difference that might prevent some brain-related side effects, Pascual explained.

The brain controls a variety of body processes, including heart rate, breathing and sleep.

However, the body also exerts some influence over the brain's function, through factors like blood sugar levels, [blood pressure](#) and oxygenation.

Until now, there has been no way to separate the brain from the body to study these influences, Pascual noted.

More information: Muhammed Shariff et al, Maintenance of pig brain function under extracorporeal pulsatile circulatory control (EPCC), *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-39344-7](https://doi.org/10.1038/s41598-023-39344-7)

The National Institutes of Health has more on [heart bypass surgery](#).

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