

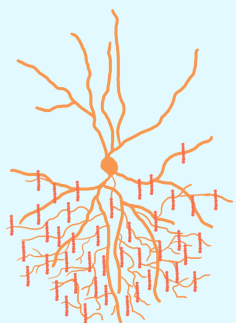
Special brain cells react to unexpected situations

New research shows that chandelier cells, a specific type of brain cell, become active during unexpected situations.

“Researchers have been wondering about the functionality of these cells for a long time”.



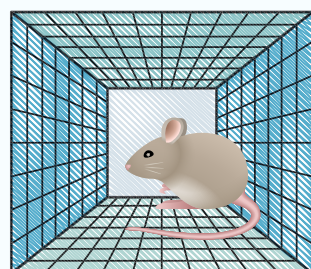
You're cycling to work through the city and suddenly you see a new building somewhere. On the first day that is very surprising. On day 2 this diminishes somewhat, and after a week you no longer notice it at all. But how does your brain signal unexpected changes and which cells are involved?



To learn more about this phenomenon our researchers from the Netherlands Institute for Neuroscience investigated a special type of brain cell found in small numbers in the cortex: the **chandelier cell**. In contrast to other inhibitory brain cells, they only inhibit one spot of other cells, but there is remarkably little known about why and when.

New mouse model

With the help of a new mouse model in which the chandelier cells are **fluorescently labeled**, it was possible to determine when the cells are active. One of the experiments tested this using a **virtual tunnel**.



When the mouse ran, the tunnel moved, and when it stopped, so did the tunnel. Using this setup, we could create an unexpected situation by stopping the tunnel while the mouse was still running. It was during these events that the chandelier cells started firing like crazy.

We see that the type of stimulus does not actually matter that much, what matters is that it is unexpected and surprising. And habituation occurs: at first the cells react strongly, but after repeated exposure the activity becomes weaker. This shows that the cells are able to adapt, which is a concept known as **plasticity**.

What does this mean?



Understanding the role of these inhibitory cells in the cortex is crucial for many processes, including learning from unexpected circumstances. We all know that you remember things better when it really surprises you. If the prediction is incorrect, that's where you can find the information. You need plasticity to update your insights, and these cells could play a role in that.

[Click here for more information and the press release.](#)



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