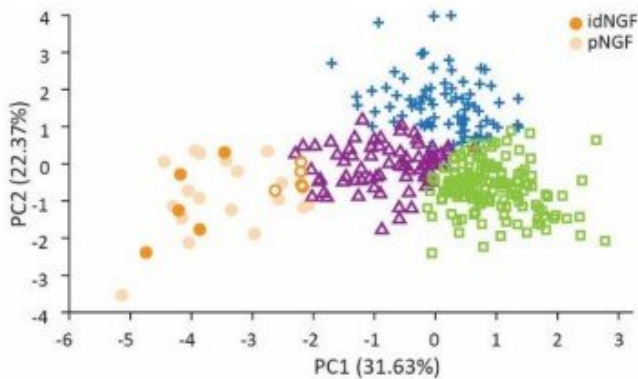


Researchers discover neuronal cell type for controlling the flow of information in the brain

15 July 2022, by Johannes Angerer



Principal component analysis and clustering identifies neurogliaform cells as a separate population. Projection of the phase preference and modulation strength of all GABAergic cells (> 200 spikes during gammaM and gammaF; N = 335) to theta oscillations, gammaM and gammaF onto the first two principal components. The four colors and symbols show the four clusters obtained by unsupervised k-means clustering on the first four principal components, which explain > 85% variance of the raw data. One of the clusters (Cluster 4; orange circle) included all 5 identified and 18 putative NGFCs, and additionally 5 other GABAergic cells, indicating that the selection of putative NGFCs was rather conservative. Credit: *Science* (2022). DOI: 10.1126/science.abo3355

A scientific team from MedUni Vienna's Center for Brain Research has now identified specific cells that regulate the transmission of information between brain areas. This discovery forms the basis for the development of new treatment options for neuropsychiatric disorders such as schizophrenia and autism, which are characterized by impaired coordination of information flow in the brain. The study has now been published in *Science*.

The scientists focused their basic research on the question of how communication between different [brain areas](#) is regulated and how the constantly changing streams of information from different sources can be processed without errors. Ece Sakalar, Thomas Klausberger and Balint Lasztocki from the Division of Cognitive Neurobiology at MedUni Vienna's Center for Brain Research sought and found answers in the so-called CA1 area of the hippocampus, a central switchboard in the brain. There, the so-called neurogliaform cells cause the converging information about the current environment and also about relevant past experiences to be combined without being mixed up.

Thus far, science has been in the dark when it comes to the function of neurogliaform cells. "In our preclinical experiments, we have now discovered that neurogliaform cells, by briefly inhibiting other [cell types](#), ensure that current perception and memories of past experiences can be processed both separately and also in combination," explains study author Balint Lasztocki. This is what makes it possible, when looking at a photograph of one's grandmother ([sensory information](#)) and spontaneously recalling the smell of her homemade cakes (memory), to remain aware of what is happening in the here and now and what is being remembered.

Traffic light in the flow of information

The regulation of ongoing and remembered information and the smooth flow of communication between [brain areas](#) is the basis for a functioning nervous system. In various [neuropsychiatric disorders](#), such as schizophrenia and autism, this organization is impaired. In this context, the current research results from the MedUni Vienna study offer hope: by deciphering the function of

neurogliaform cells as traffic lights in the flow of information, the researchers are laying foundations for the development of new treatment options.

Next in their research, the scientists intend to investigate how the activity of neurogliaform cells can be influenced to form the starting point for new drugs and therapeutic options for neuropsychiatric disorders such as schizophrenia and autism.

More information: Ece Sakalar et al, Neurogliaform cells dynamically decouple neuronal synchrony between brain areas, *Science* (2022).
[DOI: 10.1126/science.abo3355](https://doi.org/10.1126/science.abo3355)

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