



News release

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**Superfast stars in the brain:
Astrocytes show calcium signals similarly fast as neurons**

The group of Bruno Weber at the University of Zurich has identified fast astrocyte calcium microdomains occurring in the cells' fine processes that have similar onset times to neuronal signals. The dynamics of these astrocytic signals suggest they play a role in cortical information processing or neurovascular coupling. This work finally settles the debate about the temporal dynamics of astrocyte calcium signals.

SUMMARY

Sensory stimulation evokes intracellular calcium signals in astrocytes; however, the timing of these signals is disputed. In a paper published in *Neuron* today, the group of Bruno Weber used novel combinations of genetically encoded calcium sensors for concurrent two-photon imaging of cortical astrocytes and neurons in awake mice during whisker deflection. They identified calcium responses in fine astrocyte processes that rapidly followed neuronal events (~120 ms after). Before this study, it was much disputed whether astrocytes (besides neuron the other very numerous brain cells) was fast and specific enough to play a role in synaptic modulation and the regulation of blood flow. This study now underlines the important roles of astrocytes even in very time critical brain processes.

HIGHLIGHTS

- A sub-population of astrocyte calcium signals have similar temporal dynamics to neurons
- These fast signals occur particularly in microdomains, localized in the astrocytes' fine processes
- Such signals permit astrocytes to play a rapid role in cortical processing and neurovascular coupling

Literatur:

Cortical circuit activity evokes rapid astrocyte calcium signals on a similar time scale to neurons. Jillian L. Stobart, Kim David Ferrari, Matthew J.P. Barrett, Chaim Glück, Michael J. Stobart, Marc Zünd, Bruno Weber, *Neuron*. Published online 26. April 2018.

Cell Press has also published a video abstract featuring this article.

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