Astrocytic Network Heterogeneity in the Nucleus Accumbens

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Unraveling the principles of information processing in complex cell circuits requires techniques capable of target and modulates specifically the activity of those elements involved.

Neuro-astrocyte networks display a surprising degree of complexity and state-of-the-art complementary tools are required to understand astrocyte involvement in circuit modulation and behavior. Although the evolution of genetic tools to study and control these circuits has focused mainly on neuronal activity, in this talk, I will show newly developed techniques in our laboratory to specifically dissect the active astrocyte circuits with spatio-temporal precision, i.e. *CaMPARI$_{GFAP}$* (calcium-modulated photoactivatable ratiometric integrator under GFAP promoter) and *Astro-Light* (calcium- and light-gated switch to induce gene expression in activated astrocytes). Furthermore, I will discuss our recent data about mapping the functional astrocytic-circuitries in the Nucleus Accumbens (NAc) that reveal the existence of specific-astrocyte circuits in the NAC.

In short, I will present data, acquired using cutting-edge tools, which supports the idea that NAc astrocytic networks are critical players in understanding the way that the NAc integrates information.