SOCIÉTÉ CHIMIQUE DE GENÈVE

Neuron-glia metabolic coupling: role in neuronal plasticity and functional brain imaging

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How the energetic demands related to neuronal function are met in register with synaptic activity?

We have identified a set of mechanisms centered around the role of astrocytes in coupling synaptic signals mediated by glutamate to the entry of glucose into the brain parenchyma and the provision of energy substrates to restore the energy budget of neurons. We have also characterized another aspect of neurotransmitter- regulated energy metabolism, namely that related to glycogen mobilization in register to neuronal activity. These results have a particular relevance to functional brain imaging as they have provided the cellular and molecular bases for the understanding of the signals detected by these imaging techniques during activation of specific neuronal pathways. Another temporal dimension of neuronal activity is one related to the mechanisms of synaptic plasticity which are expressed over prolonged time-scales up to hours or days and which are tough to underlie the processes of learning and memory. Accordingly, we are now addressing the issue of "metabolic plasticity".

Conférence présentée le

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