

### *Selected Publications*

Chever O, Dossi E, Pannasch U, Derangeon M, **Rouach N.** (2016) Astroglial networks promote neuronal coordination. *Science Signaling*; 9(410): ra6.

Pannasch U, Freche D, Dallérac G, Ghézali G, Escartin C, Ezan P,..., **Rouach N.** (2014) Connexin 30 sets synaptic strength by controlling astroglial synapse invasion. *Nature Neuroscience*, 17: 549-558.

Chever O, Lee CY, **Rouach N.** (2014) Astroglial connexin 43 hemichannels tune basal excitatory synaptic transmission. *Journal of Neuroscience*, 34: 11228-11232.

Pannasch U, Vargova L, Reingruber J, Ezan P, Holcman D, Giaume C, Sykova E, **Rouach N.** (2011). Astroglial networks scale synaptic activity and plasticity. *Proceedings of the National Academy of Science (USA)*, 108: 8467-8472.

**Rouach N**, Koulakoff A, Ezan P, Willecke K, Giaume C. (2008) Astroglial metabolic networks sustain hippocampal synaptic transmission. *Science*, 322: 1551-1555.

# Bonn Lecture Series in Neuroscience



## Unraveling the role of astroglial perisynaptic nanodomains in synaptic strength and memory

***Nathalie Rouach, Dr.***

Neuroglial Interactions in Cerebral Physiopathology, Center for Interdisciplinary Research in Biology, Paris, France.

Thursday, June 30<sup>th</sup> 2016, 15:00h

Life & Brain, Seminar Room, Ground Floor

Astrocytes play active roles in brain physiology by dynamic interactions with neurons. The modalities of such interactions remain nevertheless elusive. Connexin 30, one of the two astroglial gap-junction subunits, is thought to be involved in behavioral and basic cognitive processes. However, the underlying cellular and molecular mechanisms were unknown. We will show here in mice that connexin 30 controls hippocampal excitatory synaptic transmission through modulation of astroglial glutamate transport, which directly alters synaptic glutamate levels. Unexpectedly, we found that connexin 30 regulated cell adhesion and migration and that connexin 30 modulation of glutamate transport, occurring independently of its channel function, was mediated by morphological changes controlling insertion of astroglial perisynaptic processes into synaptic clefts. By setting excitatory synaptic strength, connexin 30 plays an important role in long-term synaptic plasticity and in hippocampus-based contextual memory. Taken together, these results establish connexin 30 as a critical regulator of synaptic strength by controlling the synaptic location of astroglial processes.