



In Vivo Monosynaptic Excitatory Transmission between Layer 2 Cortical Pyramidal Neurons

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How cortical states affect synaptic integration is debated as very little is known about the properties of monosynaptic transmission in vivo. We made multiple two-photon targeted whole-cell recordings from monosynaptically connected excitatory pyramidal neurons in mouse primary somatosensory cortex in vivo and found a sparsely connected, structured network of small amplitude, reliable synaptic connections. We provide a new approach to study monosynaptic connections in vivo. This approach allows us to investigate the impact of network activity on monosynaptic transmission and the processing of sensory input in monosynaptically connected networks.

Selected Publications

Jouhanneau JS, Kremkow J, Dornn AL, Poulet JF. (2015) In Vivo Monosynaptic Excitatory Transmission between Layer 2 Cortical Pyramidal Neurons. *Cell Rep*, 13: 2098-2106.

Jouhanneau JS, Ferrarese L, Estebanez L, Audette NJ, Brecht M, Barth AL, Poulet JF. (2014) Cortical fosGFP expression reveals broad receptive field excitatory neurons targeted by P0m. *Neuron*, 84: 1065-1078.

Jouhanneau JS, Ball SM, Molnár E, Isaac JT. (2011) Mechanisms of bi-directional modulation of thalamocortical transmission in barrel cortex by presynaptic kainate receptors. *Neuropharmacology*, 60: 832-841.

Yassin L, Benedetti BL, **Jouhanneau JS**, Wen JA, Poulet JF, Barth AL. (2010) An embedded subnetwork of highly active neurons in the neocortex. *Neuron*, 68: 1043-1050.