

POSTER PRESENTATION

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On the basic mechanisms of anticipated synchronization in neuronal circuits

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From 24th Annual Computational Neuroscience Meeting: CNS*2015
Prague, Czech Republic. 18-23 July 2015

Anticipated synchronization (AS) is an anti-intuitive phenomenon that can occur in two coupled dynamical systems when there is a dominant connectivity between the elements. AS occurs when a dynamical system A dominantly connects to another system B and B synchronously pulses before A does. It has been recently shown [1,2] that AS can occur in a model of coupled Hodgkin-Huxley (HH) neurons and even in neuron populations. Recently, this astonishing regime has been observed in some cortical circuits of monkeys when performing a visual discrimination task [2]. However, the basic mechanisms for this synchronization to occur are still unclear. In this communication we analyze a circuit of excitatory and inhibitory HH neurons as well as neurons populations and find, analyzing individual responses as well as phase response curves, that inhibitory neurons can control the transition between delayed and anticipated synchronization.

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Published: 18 December 2015

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doi:10.1186/1471-2202-16-S1-P167

Cite this article as: Matias et al.: On the basic mechanisms of anticipated synchronization in neuronal circuits. *BMC Neuroscience* 2015 **16**(Suppl 1):P167.

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