

BMI SEMINAR

Wednesday, May 4, 2011

12:15

Hugh Robinson

Dept. of Physiology, Development and Neuroscience,
Cambridge University, UK

“Irregular spiking in cortical inhibitory interneurons”

Many neurons in the brain fire quite regularly or periodically when excited with a constant stimulus, and the ability to fire periodically is important for generating patterns of synchronous oscillation. Hodgkin-Huxley type models of voltage-dependent ionic conductances provide a good biophysical understanding of this behaviour. However, the dynamics of irregular or aperiodic firing in neurons are still poorly understood, and are complicated by the need to distinguish between the variability of the synaptic input and intrinsically-generated variability. I will describe our recent work on a genetically-defined type of irregular spiking (IS) inhibitory neuron in mammalian neocortex, in which the irregularity is generated intrinsically, and which can synchronise with other IS neurons via specific gap junctions. I will describe experiments on the properties and biophysical mechanisms of this irregularity, and propose a computational model which accounts qualitatively for many of its features.

Joint work with Mariana Vargas-Caballero and Ole Paulsen.

Host: Wulfram Gerstner

Conference Room **SV 1717A**
EPFL – Lausanne