

Mechanism of Delay in Olfactory Granule Cells

Psalmond, Lorane; Ermentrout, G. Bard

Department of Mathematics

University of Pittsburgh

Abstract: The ability to encode olfactory information in the brain is dependent on distinct, reliable patterns of neuronal firing. An individual inhibitory granule cell of the olfactory bulb displays an extremely reliable, consistent delay in firing. Such consistent delay in inhibitory interneurons is believed to give rise to reliable patterns of mitral cell firing, which allows the brain to encode olfactory information. However, not much is known about the mechanism for delay in the olfactory granule cells. Several potential contributing factors were explored using the simulation software XPP. The effects of NMDA, A-type potassium current, and CAN currents on the delay of firing were studied. The reliability of such delay after introducing noise was also investigated.