Oscillatory Responses in Pre-Cortex Model of Olfactory System

I.Valova, N.Georgieva, G.Gueorguiev

We present a pre-cortex model of olfactory system. The odor molecules are first received at the sensory layer, where receptor neurons spatio-temporaly encode them in terms of their spiking frequencies. Neurons expressing a specific receptor project to two or more topographically fixed glomeruli in the olfactory bulb (OB) and create a sensory map. Excitatory postsynaptic potentials are formed in the primary dendrite of mitral cells and are encoded in an exclusive way to present them to the coupled non-linear oscillatory model of the next mitral-granule layer. This model gives us visualization, as how the brain is able to encode information from countless molecules with over 1000 different odor receptors.