

Poster H90, Tuesday, April 3, 8:00 – 10:00 am, 4th Floor Exhibit Hall

Perception as the integral of semblances formed by re-activation of existing previously formed functional LINKs between the postsynapses

Kunjumon Vadakkan¹; ¹Division of Neurology, Faculty of Medicine, University of Manitoba

How does firing of a neuron or activation of its synapses impart an internal sensory meaning of perception to the nervous system that it is a part of? An item in the environment can induce simultaneous activation of multiple sensory receptors, similar to associative learning. This induces changes at the locations of convergence of the sensory pathways at higher brain orders such that at a later time point when only one of the sensory inputs arrives, it is capable of inducing semblance of the remaining sensations that arrived with it before. This can be explained by the formation of a functional LINK between postsynapses (postsynaptic membranes), each from different sensory inputs, at locations of their convergence. At a later time point when only one of the sensations arrives at its postsynapse, the functional LINK gets re-activated activating the LINKed postsynapse. Activation of this second postsynapse without the activation of its presynapse induces a semblance of activity arriving from the latter (Vadakkan KI (2011), *Frontiers in Neuroengineering*). The sensory identity of this semblance of activity can be extrapolated from the penultimate neuronal orders that lead towards the sensory receptor level. From this, hypothetical packets of sensory inputs that can stimulate the minimum number of sensory receptors to induce the semblance, namely “semblions” are derived. The internal sensation of perception can be viewed as an integral of all the semblions formed and is a function of the previously formed functional LINKs, which in turn is a function of previous associative learning.

Topic Area: PERCEPTION & ACTION: Multisensory