

Semblions induced through inter-postsynaptic functional LINKs, biological parallels of K-lines, as basic units of internal sensations

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Reductionist approaches to discover the basic units that represent the internal sensations of memory and other higher brain functions require examination of their formation at physiological time-scales. During memory retrieval and hallucination, activation of certain neurons at specific locations is reported. On the other hand, experimental evidence shows activation of neuronal sets evoking different internal sensations. How does the firing of a neuron impart sensory meaning to the nervous system that it is a part of? An argument has been made towards the requirement for substantive role for internal representation in the brain (1). The present work derives the qualities of possible unitary sensory elements contributing to internal sensations. It is hypothesized that when multiple new sensory stimuli are activated together, functional LINK between the postsynapses of synapses that carry those different sensations is formed such that, presentation of one of the stimuli will re-activate the functional LINK to activate the opposite postsynapse (2). It is also hypothesized that the resulting activation of the opposite postsynapse, in a system where neurons at certain neuronal orders fire in an oscillating mode, will induce a semblance of activity coming from the latter's presynaptic terminal (2). The nature of this hallucination can be extrapolated towards the sensory receptor level to identify its sensory quality. Since large number of combinations (for spatial summation of EPSPs) and permutation (for temporal summation of EPSPs) of the neurons whose activity can give rise to an action potential, extrapolation in a retrograde fashion towards the sensory level will identify different sets of sensory receptors whose activation can theoretically cause the activation of a postsynapse. A hypothetical packet of minimum sensory stimuli, capable of activating one of the extrapolated sets of sensory receptors, namely *semblion* is expected to be perceived by a nervous system when a specific postsynapse or neuron is activated. Integration of semblions using computational approaches can help elucidate the identities and nature of semblions that match with the internally generated sensations (2). The functional LINKs can be viewed as biological parallels of K-lines (3).

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