

**25th International Conference on
NEUROLOGY: NEUROCHEMISTRY
NEUROPHARMACOLOGY AND NEUROSCIENCES
&
International Conference on
NEUROONCOLOGY AND NEUROSURGERY
September 17-18, 2018 Dubai, UAE**

Pattern separation in a spiking neural network of hippocampus robust to imbalanced excitation/inhibition

Faramarz Faghihi¹, Homa Samani² and Ahmed A Moustafa³

¹University of Gottingen, Germany

²University of Isfahan, Iran

³Western Sydney University, Australia

Efficient pattern separation in dentate gyrus plays an important role in storing information in the hippocampus. Current knowledge of the structure and function of the hippocampus, entorhinal cortex and dentate gyrus, in pattern separation are incorporated in our model. A three-layer feedforward spiking neural network inspired by the rodent hippocampus an equipped with simplified synaptic and molecular mechanisms is developed. The aim of the study is to make a spiking neural network capable of pattern separation in imbalanced excitation/inhibition ratios caused by different levels of stimulations or network damage. This work presents a novel theory on the cellular mechanisms of robustness to damages to synapses and connectivity of neurons in dentate gyrus those results in imbalanced excitation-inhibition activity of neurons. This spiking neural network uses simplified molecular and cellular hypothetical mechanisms and demonstrates efficient storing of information in different levels of stimulation and can be implemented in cognitive robotics.

Notes: