1125-92-544 **Pengcheng Xiao*** (px3@evansville.edu), 1800 Lincoln Ave, Evansville, IN 47630, and **Jianzhong Su** (su@uta.edu), 701 South Nedderman Dr, Arlington, TX 76019. *A calcium time course based computational model for acute stress related cortisol dynamics and synaptic plasticity.* Preliminary report.

How acute stress can affect human cognitive functions has been a very popular topic for researchers from different fields including physiology, psychology, biology, neuroscience, and applied mathematics. Hypothalamic-pituitary-adrenal (HPA) axis plays an important role in response to stress by releasing hormones, and level of glucocorticoid has been widely considered to be one key factor to distinguish people with different stress disorder. Emerging evidence has shown that glucocorticoid act on glutamate neurotransmission system and consequently influences neuronal activities's cognitive function. It changes in the glutamate release and induces synapse plasticity change. Spike-Timing Dependent Plasticity (STDP) is one of the important neuroscience foundations for cognitive function. In this paper, we incorporate the HPA axis and CA1 neuron models to explore the plasticity outcome based on divergent type of acute stress. Various of spikes will be applied to test the Spike-Timing Dependent Plasticity in different durations. The results in different facets show that CA1 neuron potentiation changes due to different stress input.

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