1067-92-1436 **Brent Doiron*** (bdoiron@pitt.edu), Department of Mathematics, University of Pittsburgh, 301 Thackeray Hall, Pittsburgh, PA 15206. *Correlation shaping in spiking neurons.*

Correlated activity between neural spike trains is widespread across the brain, well documented in sensory, cognitive, and motor areas. Neural correlations impact the coding performed by a population of neurons, as well as mediate interactions between distinct pools of neurons. More recently, experiments from a variety of brain areas have shown that the correlation between neurons, measured over a broad range of timescales, can be shaped by both stimuli and the cognitive state of a subject. Despite these observations, the underlying mechanisms responsible for shaping correlations are poorly understood. Drawing from techniques in point process theory as well as non-equilibrium statistical mechanics, we present a simple framework that models how the susceptibility for neurons to correlate to external, shared fluctuations is shaped by background modulatory inputs and feedforward inhibition. In a variety of situations we find that increases in short timescale correlation (synchrony) are associated with decreases in long timescale correlation (co-variation in firing rates). Theoretical results will match experimental findings from cortical slices, and in vivo recordings from somatosensory cortex as well as brainstem areas in weakly electric fish. (Received September 21, 2010)