Supplementary Material

Prefrontal oscillations modulate the propagation of neuronal activity required for working memory

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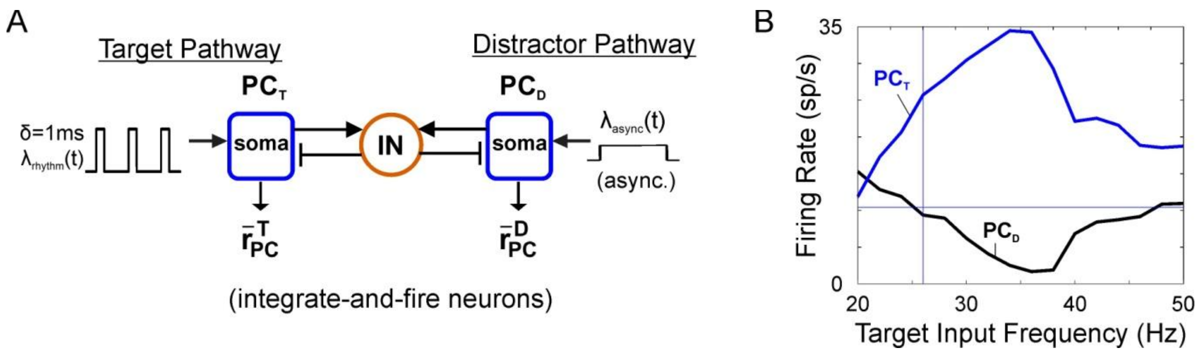
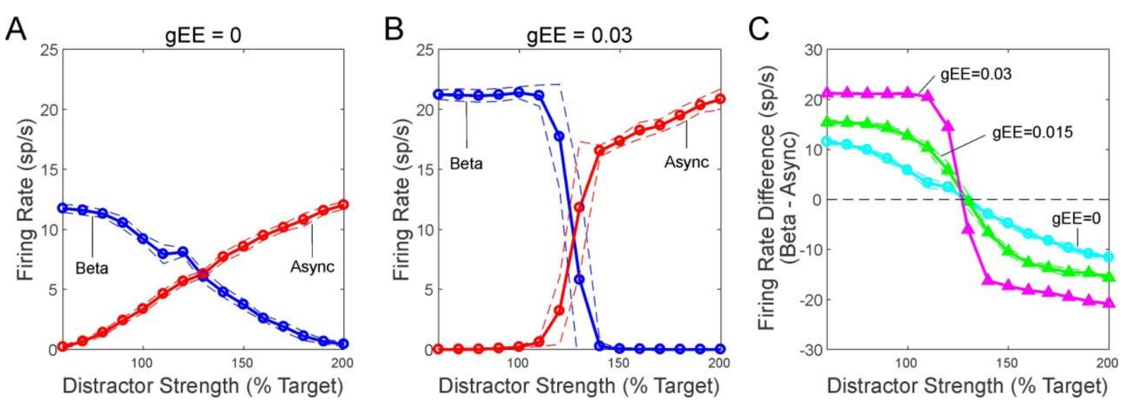


Supplementary Figure 1. Competitive interaction between populations in a leaky integrate-and-fire (LIF) network. (A) Schematic showing asynchronous Poisson spike trains driving principal cells (PCs) coupled to interneurons (INs) providing strong feedback inhibition. Inputs to the LIF network were the same as the more detailed PFC network described in the Methods section except that g_{inp} = 0.00375 mS/cm^2 and g_{noise} = 0.0056 mS/cm^2. See (Sherfey et al., 2018a, S3 Fig) for LIF model equations. (B) Mean firing rate outputs for target (blue) and distractor (red) as target input frequency is increased (compare to Figure 3Cii).



Supplementary Figure 2. Winner-take-all behavior of the PC/IN network with recurrent excitation. (A) Simulation without recurrent excitation. The plot shows the firing rate of two, competing PC populations: one driven by a resonant, beta2-frequency oscillation (blue) and the other driven by an asynchronous signal with strength that varied from 100% to 200% that of the oscillatory signal. (B) Simulation with recurrent excitation. (C) Comparison of the differential firing rates (similar to Figure 6Bi) between the populations driven by oscillatory versus asynchronous signals. Intermediate levels of recurrent excitation (green) produce a transition between the biased response (cyan) and winner-take-all dynamics (magenta).