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Title: Role of frequency mismatch in neuronal communication through coherence

Abstract: Neuronal gamma oscillations have been described in local field potentials of different brain regions of multiple species. Gamma oscillations are thought to reflect rhythmic synaptic activity organized by inhibitory interneurons. While several aspects of gamma rhythmogenesis are relatively well understood, we have much less solid evidence about how gamma oscillations contribute to information processing in neuronal circuits. One popular hypothesis states that a flexible routing of information between distant populations occurs via the control of the phase or coherence between their respective oscillations. How can this happen if there is a mismatch between the frequencies of gamma oscillations? How communication efficiency and coherence between the two populations are then being affected? Once two populations lock their peak frequencies, an optimal phase relation for communication appears. However, the sensitivity of locking to frequency mismatch suggests that only a precise and active control of gamma frequency could enable the selection of communication channels and their directionality.