

Models of frequency preferences of prefrontal cortical neurons

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Abstract

The reliability of spike trains generated by sinusoidal current injections in prefrontal cortical pyramidal cells and interneurons depends strongly on the input frequency. We constructed computational models in order to study how cellular properties affect reliability. The models reproduced the main experimental findings: subthreshold oscillations, resonance and reliability of spike timing. The amplitude of intrinsic noise in the model determined the number of reliable frequency bands. In addition, the frequency content of the noise did not affect reliability.