Temporal Dynamics of Three Populations of Inhibitory Interneurons in Turtle Visual Cortex

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Abstract

Visual stimuli evoke waves of electrical activity that propagate across the visual cortex of freshwater turtles. The experimental methods used to demonstrate these waves measure the activity of populations of pyramidal cells. However, turtle visual cortex contains at least three populations of inhibitory interneurons. This study uses a large-scale model to characterize the time course of activity in subpial, stellate, and horizontal cells. Their activities are consistent with the hypothesis that subpial cells are involved in feedforward inhibition of pyramidal cells, horizontal cells mediate feedback inhibition and stellate cells are involved in both feedforward and feedback inhibition.

Keywords: Cortical waves, Feedback inhibition, Feedforward inhibition