

**Antidromic Activation of Motoneuron-Renshaw Cell Loop - Frequency Properties of the Motoneuron and the Role of the Renshaw Cell.**

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The mechanism of the neuronal movement control in the living organism is considered. The motoneuron-Renshaw cell (MN-RC) connection has been modelled and simulated. Evaluation of its behaviour has been performed by use of the NEURON (Hines, 1993). Neural structures have been modelled as the compartments. The propagation of the potentials in neurons has been investigated by approximating the cable equations. In the simulation experiment, the MN-RC connection had been activated antidromically by bursts of impulses, as the method of motoneurons identification commonly used in experimental and clinical neurophysiologic examination. The intracellular potentials have been analysed. Some interesting behaviours of the model have been observed. One of them is the limited impact of the Renshaw cell on the motoneuron during antidromic invasion, second – is the insensitivity of the MN-RC system to the stimulus frequency for some frequency ranges. The results of the simulations have been compared with the electrophysiological observations.