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NITRIC OXIDE-ACTIVE COMPOUNDS MODULATE THE INTENSITY OF GLUTAMATE-EVOKED RESPONSES IN THE GLOBUS PALLIDUS OF THE RAT

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In this study, the effects of microiontophoretically applied NO-active compounds on glutamate(GLU)-evoked responses were investigated in globus pallidus (GP) neurons from anesthetized rats. Most GP cells were excited by S-nitrosoglutathione (SNOG), an NO donor, whereas administration of Nω-nitro-L-arginine methyl ester (L-NAME), a NOS inhibitor, induced a decrease of GP neurons activity. Nearly all neurons responding to SNOG and/or L-NAME showed significant excitatory responses to the administration of iontophoretic GLU. In these cells, the changes induced by NO-active drugs in the magnitude of GLU-evoked responses were used as indicators of NO modulation. When an NO-active drug and GLU were co-iontophoresed, significant changes in GLU-induced responses were observed: generally, increased magnitudes of GLU-evoked responses were observed during SNOG ejection, whereas the co-administration of L-NAME decreased responses to GLU. The results suggest that the NO-active drugs modulate the response of GP neurons to glutamatergic transmission, as previously demonstrated in the subthalamic nucleus (STN),. The experimental data suggest an important role exerted by the functional interaction between NO and GLU in the control of STN-GP network.

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