

AMPA-TYPE GLUTAMATE RECEPTORS IN THE OCULOMOTOR NUCLEI OF RAT AND PIGEON BRAIN

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Glutamate has been identified as the primary excitatory neurotransmitter within the central nervous system, and it plays an important role in the mediation of synaptic transmission. It may be involved in activation of the cranial motor nuclei to promote rapid responses, as required in many motor reflexes. These actions can be performed through AMPA-type glutamate receptors, which are ionotropic and endorse fast neural reaction. Immunohistochemistry and *in situ* hybridization were performed using pigeon and rat brains to investigate the localization of the subunits which constitute the tetrameric structure of these receptors within the oculomotor nuclear complex (nIII). We used antibodies against subunits GluR1, GluR4, and a third one (GluR2/3), which recognizes a common epitope of the GluR2 and GluR3 subunits. We also used specific complementary RNA (cRNA) probes to chick subunits of the AMPA-type receptors to perform the *in situ* analysis. The immunohistochemical investigation showed very few labels for the GluR1 and GluR2/3 subunits at the nIII area. Results for the GluR4 subunit, however, did display positive immunoreactivity with many neurons at the nIII clearly expressing GluR4. *In situ* hybridization results agreed with our statement above indicating positive labeling of the four glutamate subunits (GluR1-4) with intensities ranging from light to intense. These results together suggest that subunits of the AMPA-type ionotropic receptor are expressed at neurons in the nIII. Data also suggests that glutamate mediates synaptic transmissions within this region of the central nervous system, and that this transmission is mainly a result of the receptor type holding the GluR4 subunit.

Supported by: NIH and Fogarty International, Minority International Research Training Program (TW 00123-S2), NIH EY 055298 and FAPESP (Brazil).