

Endogenous ligands for the quisqualate receptor: presence in rat brain cortex synaptic vesicles

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The presence in highly purified rat brain cortex synaptic vesicles of endogenous ligands for rat brain quisqualate receptors was investigated. The vesicles were extracted, and their contents fractionated by high voltage electrophoresis. Endogenous ligands were detected by a radioreceptor assay in which such ligands competed with 50 nM L-[3H]glutamate for binding to quisqualate receptors present in rat brain postsynaptic densities (PSDs). Binding of L-[3H]glutamate to N-methyl-d-aspartate (NMDA) receptors, also present in PSDs, was blocked by 100 μ M NMDA. We found that the endogenous ligands present in brain cortex synaptic vesicles for quisqualate receptors, were glutamate and aspartate, in a molar ratio of about two to one. The quisqualate receptor had an affinity 130-fold higher for glutamate (K_d 0.3 μ M) than for aspartate, and the latter amino acid also showed a marked negative cooperativity for binding (Hill number 0.29, against 0.67 for glutamate). These findings suggest that glut