Cell lines derived from hippocampal neurons of the normal and trisomy 16 mouse fetus (a model for Down syndrome) exhibit neuronal markers, cholinergic function, and functional neurotransmitter receptors

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We have established hippocampal cell lines from normal and trisomy 16 fetal mice, a model of human trisomy 21. Both cell lines, named H1b (derived from a normal animal) and HTk (trisomic) possess neuronal markers by immunohistochemistry (enolase, synaptophysin, microtubule associated protein-2, and choline acetyltransferase) and lack glial markers (glial fibrillary acidic protein and S-100). Also, we evaluated intracellular Ca2+ levels ([Ca2+]i) in response to neurotransmitter agonists, in cells loaded with the fluorescent Ca2+ indicators Indo-1 and Fluo-3. Both cell lines responded to glutamatergic stimuli induced by glutamate, N-methyl-D-aspartate, I-amino-2,3-dihydro-5-methyl-3-oxo-4-isoxazole propanoic acid or kainate. Glutamate responses were only partially prevented by addition of 5 mM EGTA and the metabotropic glutamate receptor agonist, trans-(1S,3R)-1-amino-1,3-cyclopentanedicarboxylic acid (ACPD), increased [Ca2+]i in both cell types. These results confirm the presence of glu