Establishment and characterization of immortalized neuronal cell lines derived from the spinal cord of normal and trisomy 16 fetal mice, an animal model of down syndrome

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We report the establishment of continuously growing cell lines from spinal cords of normal and trisomy 16 fetal mice. We show that both cell lines, named M4b (derived from a normal animal) and MTh (trisomic) possess neurological markers by immunohistochemistry (neuron specific enolase, synaptophysin, microtubule associated protein-2 [MAP-2], and choline acetyltransferase) and lack glial traits (glial fibrillary acidic protein and S100). MTh cells were shown to overexpress mRNA of Cu/Zn superoxide dismutase, whose gene is present in autosome 16. We also studied intracellular Ca2+ signals ([Ca2+]i) induced by different agonists in Indo-1 loaded cells. Basal [Ca2+]i was significantly higher in MTh cells compared to M4b cells. Glutamate (200 ?M) and (1S,3R)-1-aminocyclopentane-1,3-dicarboxylic acid (ACDP) (100 ?M) induced rapid, transient increases in [Ca2+]i in M4b and MTh cells, indicating the presence of glutamatergic metabotropic receptors. N-methyl-D-aspartate (NMDA) and kainate, but