Kainate, N-methylaspartate and other excitatory amino acids increase calcium influx into rat brain cortex cells in vitro

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Kainate (0.62-5 mM) was found to increase the initial rate of influx of 45Ca and of 22Na into the non-inulin space of rat thin brain cortex slices incubated in vitro, and to shorten the equilibration time for both these ions. N-methyl-dl-aspartate (50-1000 ?M), l-glutamate (0.62-5 mM), dl-homocysteate (0.62-2.5 mM), and ibotenate (6-170 ?M) also significantly increased the influx of 45Ca into the non-inulin space of this preparation, while the non-neurotoxic acidic amino N-acetyl-l-aspartate, and ?-methy-dl-aspartate (both 1.25-5 mM), did not increase such influx. We suggest that enhanced calcium uptaje may represent the basis for the neurotoxic effects of these compounds.