Glutamate in rat brain cortex synaptic vesicles: influence of the vesicle isolation procedure

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Rat brain cortex synaptic vesicles have been isolated by 3 different procedures. The one of Hata et al. (J. Neurochem., 27 (1976) 139) gave synaptic vesicles with a high glutamate content, but also, as judged by [3H]ouabain binding and electron microscopy, wiih considerable contamination by plasma membrane vesicles. This did not allow a precise estimation of the glutamate content of each synaptic vesicle. The second procedure used (Life Sci., 21 (1977) 1075), in which the tissue is homogenized with an all glass homogenizer, yielded vesicles of higher purity, but with no glutamate. A slightly modified Kadota and Kadota procedure (J. Cell Biol., 58 (1973) 135) gave synaptic vesicles of a very high purity that were filtered on a Sepharose 4B column, and there, the synaptic vesicle fraction of highest purity was estimated to contain 3640 glutamate molecules in each glutameric vesicle. This is equivalent to an intravesicular concentration of 0.21 M, that is, at least 10 times higher than th