

Neural Stem Cell and Ependymal Cell Distribution in Embryonic and Adult Brains in the Mouse

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Neural stem cells (NSCs) exist not only in embryonic but also in adult CNS. These cells can generate neural tissue and have some capacity for self-renewal by replacing cells lost to physiological wear and injury. The aims of the study are to determine precise distribution and, possible use for cell proliferation after subsequent isolation in embryonic and adult brains. Embryonic brains at 15.5dpc and young adult brain at 4-6 week of age were analysed for nestin, vimentin, glial acidic fibrillary protein and neurofilament. For in vitro study, the cerebral cortex, hippocampus and cerebellum of embryonic or adult brains were dissociated, cultured for upto 2 weeks, and used for immunocytochemistry similarly. The results from immunocytochemistry and in situ hybridization suggest that nestin, an NSC marker was not detectable at very low level both in vivo and in vitro brain samples. However, vimentin and Itm2C, markers for ependymal cells are present at high levels among the embryonic and adult brains. Thus, it was concluded that in normal state of brain, these markers may be present at extremely low level, and that they could only be seen at enhanced levels due to upregulation by various insulting manipulations in the brain.