

## ADULT NEUROGENESIS IN MICE AND MEN: POSSIBLE RELEVANCE FOR AGE-RELATED MEMORY DISORDERS AND FOR PSYCHIATRIC DISORDERS SUCH AS SCHIZOPHRENIA

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The phenomenon of adult neurogenesis (aN), i.e. the generation of new functional neurons in the adult dentate gyrus of the hippocampus, has gathered much attention in the recent years, especially since it has been shown that this process takes also place in the human brain. A large number of variables regulate aN such as learning, exercise, stress, and age. Several lines of evidence based on the structure-function relationships support the involvement of neurogenesis in memory processing in the adult brain. In particular, adult-born hippocampal neurons have been shown to be related to complex forms of spatial or associative memories. One of the most interesting question deals with the possible relation of the age-related decline in neurogenesis and age-dependent memory impairment. Another important question deals with the role of aN in the pathophysiology of psychiatric disorders.

Although a plethora of animal studies indicate an involvement of aN in the pathophysiology of depression and that stimulation of aN is essential for the mechanism of action of anti-depressant therapies, this view has recently kindled considerable controversy. Appropriate studies in humans failed to confirm a role of reduced hippocampal neural stem cell proliferation in depression, but suggest a contribution to the pathophysiology of schizophrenia. Disturbed aN may cause erroneous temporal encoding of new memory traces, thereby contributing to cognitive deficits observed in schizophrenic patients. This aN-hypothesis of schizophrenia is supported by neuroimaging as well as by several animal models. But to date it is completely unclear whether our basic knowledge of new neurons in the adult hippocampus might eventually help fight or even prevent mental illness.