

Stem cells are good for the brain

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For some years, scientists have been speculating over why stem cells exist in the brain, as brain regeneration is limited. A German team of neuroscientists believe these stem cells help keep the brain healthy and active.

Speaking at FENS2008, Europe's major neuroscience conference, today, Professor Gerd Kempermann from the Center for Regenerative Therapies in Dresden explained that the emerging hypothesis for the function of these neural stem cells is for maintenance of a healthy brain, rather than regeneration.

The hippocampus – the region of the brain that is central to memory - requires modifications (plasticity) at a cellular level, a much more complex process than synaptic plasticity at the junction of the neurons used by other brain regions. In the adult hippocampus, stem cells produce new neurons throughout life, a process known as 'adult neurogenesis'. Surprisingly, cognitive activity, as well as physical exercise, stimulate this process..

“Our idea is that new neurons in the adult hippocampus allow this system to remain flexible to the cognitive challenges an individual might meet during his or her life. New neurons might add to a particular reserve that allows better compensation in the face of degeneration and loss,” Professor Kempermann proposed.

He suggests that on the other hand if this neural stem-cell based system fails, this loss of cellular plasticity might contribute to some aspects of

psychiatric disorders such as depression, schizophrenia and dementia. Stimulating adult neurogenesis might thus be a way to deal with these disorders.

“New neurons in the adult hippocampus might help to explain why mental and physical activity is good for the aging brain”, he said.

This research so far is in mice. Very little is known about this process in humans, but Professor Kempermann is fairly confident that the same regulatory principles apply in humans too.

Source: FENS2008

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