Injury-induced neurogenesis in the adult striatum

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The adult brain is not good at repairing itself. After brain injury, functional recovery is generally restricted to behavioral compensation and rewiring of spared circuits and there is very limited, if any, replacement of dead neurons. In the adult mammalian brain, neuron-producing stem cells do exist in two spatially restricted regions, the dentate gyrus of the hippocampus and the subventricular zone lining the lateral ventricles. These stem cells are important for normal brain function and their primary role does not seem to be to repair injuries; however, the discovery of these cells has garnered much speculation about whether the brain's inherent capacity to make new neurons can be harnessed to improve functional recovery after injury. It is likely that a detailed understanding of the mechanisms that govern adult neurogenesis will be crucial if this prospect is to become reality. The striatum has recently emerged as a brain region that sustains neurogenesis into adulthood in humans; in addition, this region is known to support injury-induced neurogenesis in animal models of stroke. In my talk, I will discuss recent findings regarding the extent, origin and molecular mechanisms governing stroke-induced neurogenesis in the striatum – results that highlight a previously unknown level of plasticity in the adult brain.