Adult hippocampal neurogenesis, from regulation mechanisms to Depression and Alzheimer's disease

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Abstract:

Adult neurogenesis results in the continuous formation of neurons in the subventricular zone and the hippocampus. It is strongly influenced by the individual's life experiences or diseases and inversely, newborn neurons participate to mechanisms of learning and memory as well as mood control. Thus, adult neurogenesis can be considered both a target to restore cognition in diseases and a marker of brain health. Interestingly, most regulation mechanisms are mediated by the cellular environment of the new cells, named the neurogenic niche. Our recent work focused on two major components of the neurogenic niche: astrocytes and blood vessels. We found that molecules produced by astrocytes increase adult neurogenesis, resulting in enhanced memory performances and reduced depression-like symptoms; and that blood-circulating molecules down-regulate adult neurogenesis in the context of anxiety and depression. Here, we propose to explore these mechanisms of regulation and investigate the interplay between anxiety and adult neurogenesis.