

Without Key Receptors, New Brain Cells Do Not Survive Migration

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(PhysOrg.com) -- Newly created brain cells lacking a critical receptor do not survive a long migration to join complex neural networks, a Yale University research team reports March 25 in the journal *Neuron*.

Understanding this [molecular mechanism](#) involved in neurogenesis — the creation of [brain cells](#) — can help improve efficiency of [cell transplant](#) surgery and lead to a better understanding of the cellular defects responsible for ADHD and schizophrenia said Angelique Bordey, associate professor of [neurosurgery](#) and cellular & molecular physiology and senior author of the study.

In the developing brain, stem cells give birth to hundreds of billions of specialized cells that form intricate networks with trillions of

connections. However, it is still poorly understood exactly how these neurons survive their long journey and reach their proper place in the network.

Bordey's team decided to study the mechanism of neurogenesis in adult brains, which in rare cases produce new cells in specific areas of the brain. These newly formed [neurons](#) acquire NMDA receptors, which are activated by the amino acid glutamate and play an essential role in the transmission of information in the brain. NMDA receptors have been implicated in ailments as diverse as schizophrenia and Alzheimer's disease. In fact NMDA receptors important for brain cell survival are mutated in ADHD and [schizophrenia](#) and are thought to contribute to susceptibility to these disorders. The Yale team found that when newly formed brain cells lose these receptors, they were much more likely to die.

The study suggests that, in order to be effective, stem cells used in transplants may need to be mature enough to possess these receptors, Bordey said. Also the study also underscores the importance of education because several drugs such as PCP, also known as angel dust, are known to block NMDA, thereby killing brain cells in infants, teenagers, and probably developing fetuses, she added.

Provided by Yale University

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