Cholesterol necessary for brain development

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A derivative of cholesterol is necessary for the formation of brain cells, according to a study from the Swedish medical university Karolinska Institutet. The results, which are published in the journal *Cell Stem Cell*, can help scientists to cultivate dopamine-producing cells outside the body.

The study was led by Professor Ernest Arenas and demonstrates that the formation of dopamine-producing neurons during brain development in mice is dependent on the activation of a specific receptor in the brain by an oxidised form of cholesterol called oxysterol. Dopamine-producing nerve cells play an important part in many brain functions and processes, from motor skills to reward systems and dependency. They are also the type of cell that dies in Parkinson's disease.

The scientists have also shown that embryonic stem cells cultivated in the laboratory, form more dopamine-producing nerve cells if they are treated with oxidised cholesterol. The same treatment also reduced the tendency of the stem cells to show uncontrolled growth.

"Oxysterol contributes to a safer and better cultivation of dopamine-producing cells, which is a great advancement since it increases the possibility of developing new treatments for Parkinson's disease," says Professor Arenas.

It is hoped that one day it will be possible to replace dead cells in the brains of Parkinson's patients with transplanted cultivated dopamine-producing cells. Such cells can also be used to test new Parkinson's

drugs.

More information: 'Liver X Receptors and oxysterols promote ventral midbrain neurogenesis in vivo and in human embryonic stem cells', Paola Sacchetti, Kyle M. Sousa, Anita C. Hall, Isabel Liste, Knut R. Steffensen, Spyridon Theofilopoulos, Clare L. Parish, Carin Hazenberg, Lars Ährlund Richter, Outi Hovatta, Jan-Ĺke Gustafsson & Ernest Arenas, *Cell Stem Cell,* 2 October 2009.

Source: Karolinska Institutet (news : web)