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[\[Genomics\] Researchers Find Changes in Cell-Surface Compounds upon Differentiation of Stem Cells](#)[\[Stem Cells\] Researchers Find Changes in Cell-Surface Compounds upon Differentiation of Stem Cells \(Chinese Version\)](#)

Academia Sinica Newsletter (2011/11/30) A research team led by Dr. John YU, Distinguished Research Fellow at the Institute of Cellular and Organismic Biology (ICOB), Academia Sinica has discovered that glycosphingolipids on the surface of cells change composition when human embryonic stem cells differentiate into precursors of specialized cells such as neurons, or liver and pancreas cells. These findings, which contribute to the search for safe ways of using stem cells for regenerative medicine, were published in the online edition of the journal Stem Cells on November 16.

Regeneration of damaged tissues is one of the holy grails in medical research, and embryonic stem cells, with their ability to renew themselves and differentiate into a diverse range of specialized cell-types, are considered a promising source for cell replacement therapies. Unfortunately, alongside their differentiation ability, embryonic stem cells also have a propensity to develop into tumors, a characteristic that currently presents a large obstacle to their clinical use.

The team of researchers from Academia Sinica's ICOB, Genomics Research Center (GRC) and Institute of Biological Chemistry recently discovered that a type of compounds found on the surface of human embryonic stem cells, called glycosphingolipids, change composition as the cells differentiate into precursors of specialized cells such as neurons and liver cells. These findings suggest that glycosphingolipids might be suitable for use as markers of the state of differentiation of stem cells. A knowledge of the state of differentiation of these cells may allow researchers to develop a method by which to sort undifferentiated cells from those that are differentiated, and thus, perhaps allow removal of the undifferentiated cells most likely to form tumors bringing the safe regeneration of human cells or organs one step closer.

The research entitled "[Changes in Glycosphingolipid Composition During Differentiation of Human Embryonic Stem Cells to Ectodermal or Endodermal Lineages](#)" can be found online on the Stem Cells website.

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