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[\[Stem Cell\] Glycosphingolipids Undergo Change in Structure during Differentiation of Human Embryonic Stem Cells -- Indicated by Research Team of Academia Sinica](#)

[Stem Cell] Glycosphingolipids Undergo Change in Structure during Differentiation of Human Embryonic Stem Cells
-- Indicated by Research Team of Academia Sinica ([Chinese Version](#))

Academia Sinica Newsletter (2010/12/17) Recently, a team of scientists at Academia Sinica have contributed to knowledge about differentiation of human stem cells by discovering that a striking switch in the structure of the glycosphingolipids (GSLs) found on the surface of embryonic stem cells occurs during the process of cell differentiation. The study, led by Dr. John YU, a Distinguished Research Fellow of Institute of Cellular and Organismic Biology, Dr. Kay-Hooi KHOO, a Research Fellow of the Institute of Biological Chemistry, and Dr. Alice L. YU, a Distinguished Research Fellow of the Genomics Research Center, was published in the international journal Proceedings of the National Academy of Sciences (PNAS) on December 13, 2010 (US Eastern Time).

GSLs are a sub-type of glycolipids that are made up of a lipid, a sugar and the amino alcohol sphingosine. They are found attached on cell surface membranes in animals including humans. GSLs on the cell-surface often cluster together with other membrane components and send signals to the cells to regulate many cell processes including cell-adhesion and migration of cancer cells.

The Taiwan team investigated human embryonic stem cells through a systematic survey of GSLs using a combination of biological techniques including immunofluorescence, flow cytometry and stem cell technologies. They found that upon differentiation of human embryonic stem cells into embryoid bodies (aggregates of cells able to recapitulate embryonic development) GSLs made a switch from "globo- and lacto" group GSLs into "ganglio" group GSLs. Among the GSLs studied, several were previously unknown.

The team hopes that the discovery will contribute to the search for cancer therapies. Dr. Alice L. YU said: "Since one of these GSLs, "globo H" has been previously proven to be a promising target for breast cancer therapeutics, the findings of the study have truly shed even more light on cancer detection and treatments."

The full-text of the study entitled "Switching Q:1 of the core structures of glycosphingolipids from globo- and lacto- to ganglio-series upon human embryonic stem cell differentiation", is available at the PNAS website at:
<http://www.pnas.org/content/early/2010/12/10/1007290108.abstract>.

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Further Information:

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