Success in the Preparation of Cerebral Precursor Cells from Embryonic Stem Cells

The laboratory for Organogenesis and Neurogenesis (Group Director: Dr. Yoshiki Sakai), RIKEN Center for Developmental Biology, has announced that it has succeeded for the first time in preparing cells as the base to become the brain (cerebral precursor cells) from the embryonic stem (ES) cells of a mouse.

ES cells are called versatile cells, and have the potential to become all kinds of cells. However, in previous in vitro experiment, it was possible to differentiate ES cells to neurocytes of the brain stem, but impossible to make brain tissue.

In this study, researchers developed a new technique of culturing the small aggregates of ES cells by floating them in a culture solution to efficiently differentiate them to neurocytes. In addition, they could temporarily deactivate the work of two factors (proteins) "Wnt" and "Nodal" that suppress nervous differentiation in the ES cells of a mouse, and succeeded in the differentiation of over 90% of ES cells to neurocytes.

The results of the analysis of differentiated neurocytes showed that about 40% were precursor cells with capability of becoming the brain.

In addition, by adding specific proteins to these precursor cells, the tissues of different regions of the brain (brain cortex, and neurocytes of the base of the brain) could be obtained.

The research results were published in the March issue of the U.S. science journal "Nature Neuroscience".
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