

***In Vitro* Neural Cell Differentiation Derived from Human Embryonic Stem Cells: II. Generation of Specific Neurons from Neural Progenitor Cells Treated with BDNF and PDGF**

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This study was to investigate generation of the specific neuronal cell *in vitro* from the neural progenitors derived from human embryonic stem (hES, MB03) cells. For the neural progenitor cell formation, we produced embryoid bodies (EB: for 5 days, without mitogen) from hES cells and then neurospheres (for 7~10 days, 20 ng/ml of bFGF added N2 medium) from EB. And then for the differentiation into neuronal cells, neural progenitor cells were cultured in N2 medium (without bFGF) supplemented with brain derived neurotrophic factor (BDNF, 5 ng/ml) or platelet derived growth factor-bb (PDGF-bb, 20 ng/ml) for 2 weeks. Specific neuronal cell differentiation was identified with immunocytochemistry using glutamate (1:1000; Sigma), tyrosine hydroxylase (1:1000; Sigma), serotonin (1:1000; Sigma) and GABA (1:1000; Sigma) antibodies. In the presence of BDNF or PDGF-bb, most of neural cells derived from hES cells were differentiated into glutamatic and GABA neuron *in vitro*. But, we confirmed that there are a few serotonin and tyrosine hydroxylase positive neuron in the same culture environment. This result suggested that most of neural progenitor cells derived from hES cells were *in vitro* differentiated into glutamate and GABA neuron in the presence of BDNF or PDGF-bb.

Key Words) *Human embryonic stem cell, PDGF, BDNF, Glutamate, GABA*