

To investigate the neuroprotection of stem cell factor in the animal model of Parkinson's disease

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Parkinson's disease (PD) is a kind of a progressive neurodegenerative disorder, which is caused primarily by selective degeneration of dopaminergic neurons in the substantia nigra pars compacta. The symptoms of PD include tremor, hypokinesia, and rigidity, caused by the depletion of dopamine in the striatum. Current therapeutic interventions of PD are aimed at controlling the symptoms of the disorder, but fail to halt the underlying degenerative process. The goal of this thesis is to find the therapeutic effect of SCF on the decreased neuronal degeneration caused by PD. The major function of SCF is to orchestrate the proliferation, differentiation, and survival of hematopoietic progenitor cells. Some reports showed that the combination of SCF exhibited a synergistic effect on mobilizing CD34⁺ cells from bone marrow to blood, which have been known as a heterogeneous population of multipotent progenitors. So, in this experiment, we would like to know the neuroprotective effect of SCF. In the animal model, after the treatment of MPTP, the analyzed data of the changed body weight, brain dopamine content, tyrosine hydroxylase content, and the dopamine neuron cell number appeared much lower than the PBS control ($P < 0.01$). Results showed that after treating with SCF, the dopamine content in striatum and the number of dopaminergic neuron cells are significantly higher than the MPTP control group ($P < 0.01$). In addition, the SCF could increase the regeneration of neuron stem cells in hippocampus. These results suggested that SCF could decrease the syndromes of Parkinson's disease, which may result from the regeneration of neuron stem cells, the anti-apoptosis of dopaminergic neuron cells. In the future, the SCF may become the drug to prevent from the Parkinson's disease.

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