1. **No.**

   FP01812209

2. **Title**

   Effects of Nicotine on Neural Circuit Regeneration after Transplantation of Neural Stem cell / Progenitor into Mice with Neural Disease.

3. **Period**

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4. **Summary**

Neural cell transplantation is a promising strategy for treating with brain damage. The aim of this study was to investigate whether neuron transplantation and signal activation through nicotine and other paracrine were associated with motor function recovery in hemiplegic mice. Reelin was expressed 1 day after cryogenic injury of right motor cortex. Nicotine (0.2 mg/kg~ 2mk / kg) significantly recovered motor dysfunction. Nicotine at the same dose also increased the number of Reelin expression. Reelin is a large glycoprotein which regulates CNS development. Dysfunctions of Reelin were reported on certain neuropsychiatric diseases. We examined involvement of Reelin pathway in functional recovery of hemiplegic mice after neural transplantation. We transplanted neural stem/progenitor cells (NSPCs) from wild-type B6 mice into ipsilateral striatum of hemiplegic mice. The WT/WT grafts migrated from the striatum and reached to the injured cortex 14 days after transplantation. The combination of the transplantation and Nicotine treatment significantly improved their motor functions. In contrast to the improved performance of WT/WT NSPC transplanted hemiplegic mice, yot/yot NSPC transplanted and PBS injected hemiplegic mice showed only marginally improvement. The grafted cells distributed widely but appeared to have a tendency to accumulate predominantly near the damaged region in the WT/WT NSPC transplanted mice, at day 28. The cell aggregate of yot/yot NSPCs migrated marginally and they little reached the damaged cortex.

[Conclusions] Our results suggest that the combination methods of cell transplantation and paracrine factor or the activation of nicotine signaling may become applicable for restoring the motor functions of patients suffering from hemiplegia.