Fundamental Study on objective diagnosis and therapy effect decision of the dementia by the molecular imaging

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	作成者: Mori, Hirofumi
	メールアドレス:
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## 2003 Fiscal Year Final Research Report Summary

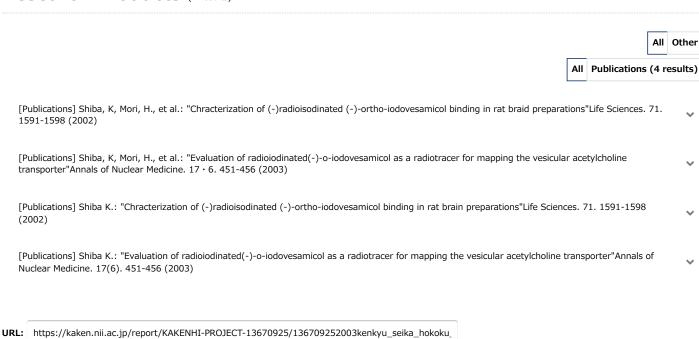
Fundamental Study on objective diagnosis and therapy effect decision of the dementia by the molecular imaging.

Research Project

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Allocation Type
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Section
一般
Research Field
Radiation science
Research Institution
Kanazawa University
Principal Investigator
MORI Hirofumi Kanazawa University, Advanced Science Research Center, Professor, 学際科学実験センター, 教授 (90019604)
Co-Investigator(Kenkyū-buntansha)
KINUYA Seigo Kanazawa University, Graduate School of Medical Sciences, Assistant, 医学系研究科, 助手 (20281024) SHIBA Kazuhiro Kanazawa University, Advanced Science Research Center, Associate Professor, 学際科学実験センター, 助教授 (40143929)
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Research Abstract

Parkinsonian rats were stereotaxically infused 6-OHDA into the unilateral mesostriatal dopamine pathway and measured apomorphine-induced rotational behavior. Controls were infused saline instead of neurotoxin. Animals were divided into transplantation(TP) and sham-operated(S) groups. Ipsilateral vagal nodosal ganglion was surgically removed horn die neck and stereotaxically transplanted as nerve fragments into the ipsilateral striatum 2 weeks after nerotoxin infusion Sequential brain sections underwent autoradiography of dopaminergic system 2 weeks after operation. Densities of dopamine D1,D2 receptors and dopamine transporter(DAT) were assessed by in-vitro autoradiography using[^3H]SCH23390,[^3H]YM-09151-2 and[^3H]GBR12935. Significant DAT decrease in striatum was shown in the model animals compared with controls(P<0.0001). D\_2 receptor in the ipsilateral striatum increased significantly in transplanted animals compared with sham-operated animals(S/R-,0.97±0.08;TP/R-,1.08±0.08;p=0.039 and S/R+,1.06±0.06;TP/R+,1.19±0.16;p=0.023), whereas DAT and D\_1 receptor showed no significant changes. Our results suggest that vagal autotransplantation induces upregulation of D\_2 receptor in the ipsilateral striatum. Autotransplantation showed no significant effect on DAT, although DAT imaging is a sensitive test for dopaminergic damage. We need hurther study on dopaminergic system imaging after neural transplantation. We evaluated the potencies of radioiodimted(-)-o-iodovesamicol [(-)-oIV] as a selective vesicular acetylcholine tmnsporter(VAChT) mapping agen. (-)-[^<125>1] oIV exhibited significant accumulationin rat brain. The regional brain distribution of radioactivity was similar for both (-)-[^<125>1] oIV and [^3H]vesamicol. The accumulation of (-)-[^<125>1] oIV in the brain was significant reduced by post-administration of unlabeled vesamicol(0.5µmol/kg^<-1>) and(-)-[^<125>1] oIV µmol/kg-1] in the other hand, the post-administration of sigma ligands hardy affected the accumulation of (-)-[^<125>1] oIV in die brain. These studies showed that (-)-[^<125>1] oIV, as well as [^3H]vesamicol, bound to VAChT with high affinity in die rat brain. Funhemore, (-)-[^<125>1] oIV binding in the ipsilateral cortex to the lesion was significantly reduced by 17.0%, compared with that in the contralateral cortex in a unilateral NBM-lesioned rat. These results suggested that radioiodimted(-)-[^<125>1] oIV may potentially be useful for the diagnosis of cholinergic neurodegenerative disorders.▲ Less

## Research Products (4 results)



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