

An application of a new planar positron imaging system (PPIS) in a small animal: MPTP-induced parkinsonism in mouse

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Objective: Recent animal PET research has led to the development of PET scanners for small animals. A planar positron imaging system (PPIS) was newly developed to study physiological function in small animals and plants in recent years. To examine the usefulness of PPIS for functional study in small animals, we examined dopaminergic images of mouse striata in MPTP-induced parkinsonism. **Methods:** Male C57BL/6NCrj mice were treated with MPTP 7 days before the PPIS study. Scans were performed to measure dopamine D₁ receptor binding and dopamine transporter availability with [¹¹C]SCH23390 (about 2 MBq) and [¹¹C]β-CFT (about 2 MBq), respectively. After the PPIS study, dopamine content in the striatum was measured by HPLC. **Results:** The MPTP treatment significantly reduced dopamine content in the striatum 7 days after treatment. In the MPTP-treated group, [¹¹C]β-CFT binding in the striatum was significantly decreased compared with the control group, while striatal [¹¹C]SCH23390 binding was not affected. Dopamine content in the striatum was significantly correlated with the striatal binding of [¹¹C]β-CFT. **Conclusion:** The present results suggest that PPIS is able to determine brain function in a small animal. Using PPIS, high throughput imaging of small animal brain functions could be achieved.

Key words: planar positron imaging system, mouse, MPTP, [¹¹C]SCH23390, [¹¹C]β-CFT