

## Evaluation of resting brain conditions measured by two different methods (i.v. and oral administration) with $^{18}\text{F}$ -FDG-PET

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Our aim was to evaluate regional differences between brain activity in two resting control conditions measured by 3D PET after administration of FDG through either the intravenous (i.v.) or the oral route. Ten healthy male volunteers engaged in the study as the i.v. group (mean age,  $26 \pm 9.3$  years,  $\pm$  S.D.) who received FDG intravenously and another 10 volunteers as the oral group (mean age,  $27.9 \pm 11.3$  years,  $\pm$  S.D.) who received FDG per os. A set of 3D-PET scans (emission and transmission scans) were performed in both groups. To explore possible functional differences between the brains of the two groups, the SPM-96 software was used for statistical analysis. The results revealed that glucose metabolism was significantly higher in the superior frontal gyrus, superior parietal lobule, lingual gyrus and left cerebellar hemisphere in the i.v. group than in the oral group. Metabolically active areas were found in the superior, middle and inferior temporal gyrus, parahippocampal gyrus, amygdaloid nucleus, pons and cerebellum in the oral group when compared with the i.v. group. These differences were presumably induced by differences between FDG kinetics and/or time-weighted behavioral effects in the two studies. This study suggests the need for extreme caution when selecting a pooled control population for designated activation studies.

**Key words:** 3D-PET, FDG, oral intake, resting condition, pooled control