

## Does heterogeneity affect [ $^{11}\text{C}$ ]flumazenil binding maps?

This document describes the simulations of the partial volume effect (PVE) on the apparent flumazenil binding results.

### Regional concentration of benzodiazepine receptors

Alkire and Haier (2001) used the following [ $^3\text{H}$ ]flunitrazepam binding values based on the measurements by Zezula et al. (1988) to calculate correlations between their [ $^{18}\text{F}$ ]FDG results and benzodiazepine receptor densities:

**Table 1.** Regional values for benzodiazepine binding densities (Zezula et al. 1988; Alkire & Haier 2001).

<b>Brain region</b>	<b>[<math>^3\text{H}</math>]flunitrazepam (fmol·(mg protein)<math>^{-1}</math>)</b>
Occiput	550
Temporal	538
Hippocampus	528
Frontal	508
Precentral	481
Thalamus	343
Cerebellum	309
Caudate	307
Putamen	304
Pons	140
Corpus callosum (white matter)	100

### Determination of model parameters for ideal grey and white matter

Lassen et al. (1995) suggest that  $DV_F + DV_{NS}$  for white matter is close to the average value for the grey matter-dominated regions. Therefore, the variable admixture of white matter will not result in a change in  $k_5/k_6$  in the three-tissue compartment model or bias in  $k_2$  and  $k_3$  in the two-tissue compartment model.

### Simulation of heterogeneity by mixing grey and white matter

PVE correction has been applied to DV images produced with spectral analysis (Koepp et al. 1997; 1998), and PVE was found to be necessary to detect bilateral changes in a subtype of epilepsy.

## References

1. Alkire MT, Haier RJ. Correlating *in vivo* anaesthetic effects with *ex vivo* receptor density data supports a GABAergic mechanism of action for propofol, but not for isoflurane. *Br J Anaesth* 2001; 86: 618-626.
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