

ABSTRACT FORM

Turku PET Symposium – please return to symposium@pet.tyks.fi

Ninth International Workshop on Targetry and Target Chemistry - please return to wtcc02@abo.fi

Family name: Virkkala	Telephone: +358-9-4747 2289	<input checked="" type="checkbox"/> Instrumentation <input type="checkbox"/> Radiochemistry <input type="checkbox"/> Neurology <input type="checkbox"/> Psychiatry <input type="checkbox"/> Cardiology <input type="checkbox"/> Endocrinology <input type="checkbox"/> Oncology <input type="checkbox"/> Drug discovery <input type="checkbox"/> Other <input type="checkbox"/> Targetry workshop
First name: Jussi	Fax: +358-9-588 4759	
Title: Physicist	E-mail: jussi.virkkala@occuphealth.fi	
Organization: Section of Clinical Neuroscience, Finnish Institute of Occupational Health		
Address: Topeliuksenkatu 41 a A, FIN-00250 Helsinki, FINLAND		

EFFECT OF SPATIAL FILTERING ON PARAMETRIC IMAGE REPRODUCIBILITY USING SIMPLIFIED REFERENCE TISSUE MODEL

Virkkala J. 1) 2), Aalto S. 2)

1) Section of Clinical Neuroscience, Finnish Institute of Occupational Health, FIN-00250 Helsinki, FINLAND

2) Turku PET Centre, University of Turku, PO Box 52, FIN-20521 Turku, FINLAND

AIMS: Simplified reference tissue model (SRTM) is a common model used to calculate parametric images where voxel values represent binding potential (BP) of neuroreceptor ligand. Our aim was to study the effect of spatial filtering of dynamic [¹¹C]-FLB 457 images on reproducibility of BP values at voxel level.

METHODS: Eight pairs of test-retest scans of [¹¹C]-FLB-457 were used in this simulation study. Each scan contained 16 frames with voxel size of 2.34 mm x 2.34 mm x 4.25 mm. Normally distributed noise with normalised variance of 0.1 was added to each time activity curve. Parametric images were calculated using Receptor Parametric Mapping (RPM) software [1] and spatially normalized to MNI space using SPM99 software [2]. Comparison was made by calculating average extrastriatal Intra Class Correlation (ICC) and variability.

RESULTS: Average extrastriatal ICC and variability were altered with filtering:

	No filter	2 mm	4 mm	6 mm	8 mm
ICC:					
-no noise	0.64	0.66	0.67	0.70	0.72
-noise 0.1	0.57	0.60	0.64	0.68	0.71
Variability:					
-no noise	16.9 %	16.7 %	16.4 %	16.0 %	15.9 %
-noise 0.1	18.2 %	17.6 %	16.9 %	15.7 %	16.1 %

CONCLUSION: Spatial filtering of dynamic images enhances reproducibility of extrastriatal BP values and reduces the effect of noise on reproducibility. Although the advantages of filtering depend on noise level of data, filtering with 6 mm Gaussian kernel seems to be useful as it impairs only minimally the final resolution of voxel-level statistical analysis.

[1] Gunn RN et al (1997). *Neuroimage* 6: 279–287.

[2] Friston KJ. et al (1995). *Hum. Brain. Mapp.* 2:189–210.