EVALUATING THE SPECIFICITY OF [18F]UCB-H FOR THE ISOFORM SV2A, COMPARED WITH SV2B AND SV2C

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Introduction

SV2A is a SV2 isoform protein involved in the synaptic vesicle trafficking and in brain process like the epilepsy (1, 2). [18F]UCB-H was developed like a tool to study the role of this isoform with neuroimaging techniques (3, 4).

The **objective** of this study was to **evaluate the specificity of this radiotracer to the isoform SV2A** comparing with the others, through a competition assay.

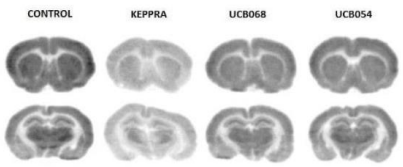
Methods

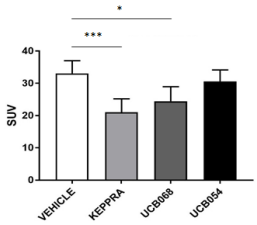
Forty male Sprague-Dawley were divided in two experiments

AUTORADIOGRAPHY	microPET IMAGING
Pretreatment with vehicle, Keppra (SV2A ligand), UCB068 (SV2B ligand) or UCB054 (SV2C ligand)	
Injection of [^{18}F]UCB-H 30 min after	
Decapitation and brain extraction 5min after	Dynamic scanner of 1h
Data in SUV	***Data in SUV → AUC***

Results

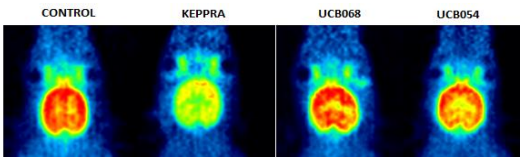
EX-VIVO AUTORADIOGRAPHY

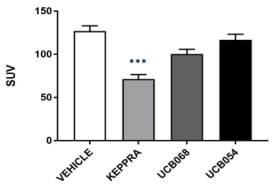




*[^{18}F]UCB-H uptake after a pretreatment with the ligands for SV2 isoforms. Histograms represent the mean and SD (n=5). Data, expressed in ROD (Relative Optical Density), were normalized to SUV (Standard Uptake Value). Two-ways ANOVA and Bonferroni post-hoc test were done, with *p<0.05, ***p<0.001.*

mPET IMAGING





*Histograms represent the mean and SD (n=5) after analysing the AUC (Area under the curve of images obtained with mPET technique during 1 hour of dynamic acquisition). Data were normalized to SUV (Standard Uptake Value). Two-ways ANOVA and Bonferroni post-hoc test were done, with ***p<0.001 between the group treated with Keppra and the rest of groups.*

Conclusion

An affinity between the ligands UCB068 and UCB054, and the receptor for the isoform SV2A exists but it is only detected during the first 5 minutes, being certainly due to a nonspecific binding. This binding is not strong enough to show a direct competition with the radiotracer during a mPET acquisition.

These results allow us to conclude that [18F]UCB-H is a suitable radiotracer for the imaging of the isoform SV2A in vivo.

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1) Van Vliet et al., 2009.Epilepsia **2)** Crèvecœur et al., 2013.BMC Neurosci. **3)** Bretin et al., 2013.EJNMMI Res **4)** Bretin et al., 2015.Mol Imaging Biol