**Title (200 characters max): Evaluating the specificity of [18F] UCB-H for the isoform SV2A, compared with isoforms SV2B and SV2C**

**Authors and affiliations:**

**ME. Serrano,** G. Becker, MA. Bahri, C. Warnier, Joël Aerts, F. Mievis, F. Giacomelli, Ch. Lemaire, E. Salmon, A. Luxen, A. Plenevaux

*Laboratory of GIGA-CRC in-vivo, Université de Liège (Belgique)*

**Abstract (400 words max): Background:** SV2A is the most studied isoform of the Synaptic Vesicle 2 proteins, which are involved in the synaptic vesicle trafficking, being important in normal and pathological 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 its specificity to this isoform comparing with the others, through a competition assay in rats with ex-vivo autoradiography and mPET imaging.

**Methods:** Forty male Sprague-Dawley were used in ex-vivo autoradiography experiments (N=20) and in microPET imaging (N=20). Animals were pre-treated 30 minutes before the injection of [18F]UCB-H with a dose IP either of vehicle, Keppra (SV2A ligand), UCB068 (SV2B ligand) or UCB054 (SV2C ligand). Ex-vivo autoradiography was carried out 5 minutes after radiotracer injection while mPET images were acquiring with a dynamic scanner of 1 hour. Data were expressed in Standard Uptake Value and then, the area under the curve was calculated for the total process.

**Results:** In ex-vivo autoradiography, ANOVA of two-ways showed statistical significant differences in brain uptake of [18F]UCB-H among the groups pretreated with Keppra or the ligand for SV2B and the control group. Regarding mPET data, statistical significant differences were found between the group injected with keppra and the rest of groups.

**Conclusion**: Even if a considerable affinity between the ligands UCB068 and UCB054, and the receptor for the isoform SV2A exists, it is only detected during the first 5 minutes (ex-vivo technique), 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, allowing us the clinical study about the molecular base of a disease with a high population impact, like the epilepsy.

Presenting author e-mail: meserrano@ulg.ac.be