EVALUATION OF MOLECULARLY IMPRINTED POLYMERS BY MEANS OF EXPERIMENTAL DESIGN PRIOR TO THE DETERMINATION OF *p*-[^{18}F]MPPF IN PLASMA

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Within the family of serotonin (5-HT) receptors, the 5-HT$_{1A}$ subtype is particularly interesting as it may be involved in various physiological processes or psychological disorders. The *p*-[^{18}F]MPPF, a highly selective 5-HT$_{1A}$ antagonist, is used for *in vivo* studies in human or animal by means of positron emission tomography[1].

In order to selectively extract *p*-[^{18}F]MPPF and its metabolites, molecularly imprinted polymers (MIPs) were prepared against analytes by using three structural analogues as templates. Non-imprinted polymers (NIPs) were also synthesized without template. These sorbents, packed in disposable extraction cartridges (DECs), were then evaluated for at-line solid phase extraction (SPE) with a sample processor (ASPEC system) coupled directly to LC. The separation was performed on octadecyl silica stationary phase with a mixture of 50 mM acetate buffer (pH 5), methanol and tetrahydrofuran (55:28:17;v/v/v) as mobile phase. The compounds of interest were photometrically monitored at 240 nm.

The SPE conditions were evaluated through an experimental design in order to investigate the retention selectivity and try to explain the retention mechanisms of *p*-[^{18}F]MPPF on these MIPs. The direct application of real samples, like aqueous solutions or biofluids, onto DECs filled with MIPs leads to a non-selective adsorption of the analytes. The MIP selectivity was exploited in the washing step by selecting a suitable washing liquid to transform non-specific interactions into more specific interactions. The respective influence of composition, volume and flow-rate of different washing liquids were investigated in this scope. The other important parameters gearing the extraction steps, such as conditioning, loading and elution, were also studied.

1. A Pleneveaux, D Weissmann, J Aerts, C Lemaire, C Brihaye, C Degueldre, D Le Bars, D Comar, J-F Pujol and A Luxen, (2000), Tissue Distribution, Autoradiography and Metabolism of 4-(2'-Methoxyphenyl)-1-[2'-[*N*-(2''-Pyridinyl)-*p*-[^{18}F]Fluorobenzamido]ethyl]piperazine (*p*-[^{18}F]MPPF), a New Serotonin 5-HT$_{1A}$ Antagonist for Positron Emission Tomography: an In Vivo Study in Rats, *Journal of Neurochemistry*, 75, 803-811

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