

PP13

New hexyl o-fluoroarylpiperazines derivatives as 5-HT_{1A} receptor ligands – synthesis and structure-activity relationship

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According to WHO (World Health Organization) reports, after 2015, the number of people suffering from depression exceeded 300 million. Depression thus becomes a significant problem for both physicians and researchers seeking new, better-functioning and safer antidepressants. [1][2] An important point of antidepressant uptake are 5-HT_{1A} receptors, while the more interesting and more frequently studied group of ligands of these receptors are long-chain arylpiperazines (LCAPs). [3]

Inspirations for the presented research were both LCAPs ligands known in the literature and our previous research of the *in vitro* activity of completely new ligands derived from *N*-hexylhaloarylpiperazine. [4][5] We decided to carry out research to explain the effect of fluoride substitution at the *ortho* position in the aromatic ring in the arylpiperazine group.

N-hexyl-(2-fluorophenyl)-piperazines ligands have been synthesized, which in their terminal part contain a phthalimide, a benzamide and a sulfonamide moiety. These ligands were obtained on the basis of a new method of synthesis in the field of microwave radiation, which is part of the "Green Chemistry" trend. All ligands obtained were tested *in vitro* for affinity for 5-HT_{1A} serotonin receptors.

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