ted to the investigated serotonin receptors, especially taking into account the sequence homology of the binding sites, we decided to obtain the homology models of 5-HT$_{1A}$ and 5-HT$_{2A}$ receptors using the novel template. Molecular models were built with Modeller 8v2 software, which allowed the conformational sampling of the binding site, by means of simulated annealing. In order to compare the lignand binding mode and asses the possible benefits of using the novel template, we performed the analysis of ligand-receptor interactions, with the use of docking procedure.

Ligands with known 5-HT$_{1A}$ and 5-HT$_{2A}$ receptor affinity were automatically docked to the multiconformational sets of the obtained receptor models, using both Glide and FlexX software, with and without pharmacophore constraints. Docking was performed with both conformationaly rigidified and flexible compounds, derived from literrature or synthesized in Department of Pharmeceutical Chemistry. The obtained results were discussed in comparison with data on previously published (5-HT$_{1A}$) [3] or newly obtained (5-HT$_{2A}$) rhodopsin-based models.

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Mannich bases, 5-arylimidazolidine-2,4-dione derivatives with arylpiperazine moiety, as 5-HT$_{1A}$ receptor ligands with serotonin transporter affinity

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In recent years there have been a lot of published articles aimed at creating a single hybrid molecule that possesses both 5-HT$_{1A}$ antagonism and serotonin reuptake inhibition [1-4]. Such a molecule could prove to be a better rapidly acting antidepressant than selective serotonin reuptake inhibitors (SSRIs), which are currently used in the therapy of depression [5].

In the course of searching for the new potential antidepressants, which block 5-HT$_{1A}$ receptor and inhibit serotonin reuptake, series of arylpiperazinylalkyl containing 5-aryl-imidazolidine-2,4-dione moiety were synthesized. Then their influence on central serotonergic transmission was examined in a different pharmacological tests. In the radioligand studies the affinity towards central nervous system receptors (5-HT$_{1A}$, 5-HT$_{2A}$ and α_1) and serotonin transporter were evaluated. For selected compounds, which have shown specially promising properties in *in vitro* tests, their anxiolytic and antidepressant activities were investigated in the four-plate test, in the forced swimming test and in the locomotor activity test in mice.

In order to describe the interaction mode of the investigated compounds with 5-HT$_{1A}$ serotonin receptor, *in silico* studies were carried out, comprising automated docking of selected compounds to the molecular model of 5-HT$_{1A}$ receptor. Furthermore the lipophilic character of the compounds (a crucial physicochemical factor for potential CNS activity) was also evaluated by use of RP-TLC and computational methods.

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Quantitation of pseudoephedrine in dosage form

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Ephedrine alkaloids are used for the treatment of asthma and nasal congestion. There are numerous drugs containing pseudoephedrine hydrochloride in combination with paracetamol and other ingredients.

^{1}H NMR spectroscopy in solution application for quantitative determination of the alkaloids from Ephedra species: (-)-ephedrine, (+)-pseudoephedrine, and (+/-)-norephedrine, either singly or in mixtures with each other was reported. The method was specific and accurate.

However, there are a number of situations when it is necessary to determine the concentrations of components in solid-state mixtures without dissolving the sample. Therefore, an attempt was made to quantify pseudoephedrine in a solid formulation with microcrystalline cellulose.

Samples with different fractions (from 5.09 to 95.97 % g/g) were prepared by mixing pure **(3S,2S)-(+)-pseudoephedrine hydrochloride** and pure microcellulose (Avicel-105), one of the most commonly used excipients. To obtain homogeneous physical mixtures, the components were mixed for 5 minutes using an electric mixer.

Cross-polarization (CP) magic angle spinning (MAS) solid-state ^{13}C NMR spectra were recorded. The CP parameters were used as optimized for experiments with pure (3S,2S)-(+)-pseudoephedrine hy-