

## **IN SILICO ASSESSMENT OF BIOAVAILABILITY, PHARMACOKINETIC AND TOXICOLOGICAL PROPERTIES OF NEUROTRANSMISSION MODULATORS OF 5-HT<sub>7</sub> RECEPTORS**

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Serotonin transmission is important for psychiatric disorders (depression, anxiety, schizophrenia and epilepsy). 5-HT<sub>7</sub> receptors are new target receptors for the development of drugs as a therapeutic alternative in the treatment of psychiatric diseases, therefore there is a need to discover 5-HT<sub>7</sub> receptor agonists and antagonists. For 38 selected compounds, 5-HT<sub>7</sub> receptor neurotransmission modulators, bioavailability, pharmacokinetics and toxicological properties were assessed. Based on the calculations, 37 compounds (except compound 28) do not show more than one deviation from the Lipinski rule, and good absorption and permeability are possible after oral administration. Good blood-brain permeability was predicted for 29 tested compounds, while poor blood-brain permeability was predicted for 9 compounds. Moreover, 30 compounds exhibited inhibition of the CYP 450 3A4 isoenzyme, while 16 compounds were not a substrate for P-glycoprotein. The risk of mutagenicity is not shown by any of the tested compounds (except compounds 5, 22, 23). Thirty-five tested compounds do not show the risk of carcinogenicity. Most of the 5-HT<sub>7</sub> receptor modulators tested do not pose a risk for reproductive toxicity and irritant effect. Based on the obtained results for drug similarity parameters and pharmacokinetic properties, the tested 5-HT<sub>7</sub> receptor modulators (compounds 1-38) should have good bioavailability after oral administration, as well as good blood-brain permeability (29 tested compounds). *In vitro* and *in vivo* studies of the tested 5-HT<sub>7</sub> receptor modulators, except for compounds 5, 11, 17, 22, 23, 34, could be performed to verify the results obtained because the tested compounds have the potential to be new drugs in the treatment of psychiatric diseases in the future.

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**Key words:** 5-HT<sub>7</sub> neurotransmission modulators, *in silico*, bioavailability, pharmacokinetic properties, toxicological properties