# NEW POTENT TrmD INHIBITORS FROM THE SERIES OF THIENO[2,3-*d*]PYRIMIDIN-3(4*H*)-YL)-*N*-ARYLACETAMIDES

**Vlasov S. V., Vasylchenko V.S., Severina H. I.**
*National University of Pharmacy, Kharkiv, Ukraine*
2024pharmchem.vlasov@gmail.com

**Introduction:** Transport RNA-($N^1$G37) methyltransferase (TrmD) is an S-adenosylmethionine (AdoMet)-dependent methyltransferase that synthesizes methylated m1G37 in tRNA. TrmD is specific and essential for bacterial growth and is fundamentally different from its eukaryotic and archaeal counterpart Trm5. TrmD is unusual in using a topological protein knot to bind AdoMet. Inhibition of TrmD activity blocks such intramolecular signaling and reduces m1G37-tRNA synthesis, prompting ribosomes to +1 frameshift and premature termination of protein synthesis. Considering the importance of TrmD as a molecular target in the search for new antibiotics, the goal of our research was to create new compounds - derivatives of 2-(4-oxo-5,6,7,8-tetrahydro[1]benzothieno[2,3-*d*]pyrimidin-3(4*H*)-yl)-*N*-phenylacetamide, which are potential inhibitors of bacterial TrmD according to molecular docking predictions.

**Materials and Methods:** Methods of organic synthesis, molecular docking, analysis of literature data and generalization of results regarding TrmD inhibitors. In the course of research, methods of modern information search, bibliographic, analytical, comparative and general analysis were used

**Results and Discussion:** By selective alkylation of 5,6,7,8-tetrahydro[1]benzothieno[2,3-*d*]pyrimidin-4(3*H*)-one with aryl chloroacetamides in the medium of dimethylformamide a number of 2-(4-oxo-5,6,7,8-tetrahydro[1]benzothieno[2,3-*d*]pyrimidin-3(4*H*)-yl)-*N*-phenylacetamide derivatives were obtained, which in an experiment on molecular docking showed the ability to bind to the active site of TrmD isolated from *P. aeruginosa*. *N*-(3-Chlorophenyl)-2-(4-oxo-5,6,7,8-tetrahydro[1]benzothieno[2,3-d]pyrimidin-3(4*H*)-yl)acetamide was determined to be the most effective inhibitor.

**Conclusions:** An effective method for the synthesis of 2-(4-oxo-5,6,7,8-tetrahydro[1]benzothieno[2,3-*d*]pyrimidin-3(4*H*)-yl)-*N*-phenylacetamide derivatives, which are potential new bacterial TrmD inhibitors

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