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ANTIMICROBIAL AND REGULATORY EFFECTS OF THIAZOLO PYRIDINE DERIVATIVES

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The fight against infectious diseases is one of the most pressing issues in health care. However, drugs which were effective a few years ago have lost their positions nowadays. The rate at which the microorganisms' resistance to classical antibacterial drugs develops and spreads is striking. The aim of the present work was to study a newly synthesized compound of thiazolopyridines and find out the possible mechanisms of their effects on the activity of the NO-synthase system of blood lymphocytes, since nitric oxide is considered as one of the most important regulators of adaptive possibilities of an organism. Based on the traditional screening of antibacterial and antifungal activity against the clinical isolates of *Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes, Pseudomonas aureginosa, Bacillus subtilis, Escherichia coli, Proteus vulgaris* and *Candida albicans* by agar diffusion and serial dilutions, about 50 original thiazolopyridine derivatives were studied. Among these derivatives, the compound of N-[2-(5,7-dimethyl-2-oxo-thiazolo [4,5-b]-pyridin-3-yl)-acetyl]-hydrazide of acetate acid was detected in the study. This compound showed high antimicrobial effect in comparison with amoxicillin/clavulanate using different test cultures of microorganisms. To determine the regulatory effect of N-[2-(5,7-dimethyl-2-oxo-thiazolo[4,5-b] pyridin-3-yl)-acetyl]-hydrazide acetic acid on the NO-Synthase activity peripheral blood lymphocytes were used as a test-object of research. It was found that the compound in the concentration range of 10-6–10^{-3} M in dose-dependent manner suppressed the total NO-synthase activity of blood lymphocytes. The compound concentration of 10^{-3} M suppressed the enzyme activity by 80%. When studying the effect of studied compound on the activity of specific isoforms of NO-synthase, it was found that it inhibited the activity of both endothelial and inducible isoforms of enzyme. High concentrations of compounds (10^{-3} M) inhibited eNOS activity by 42%, while inhibiting iNOS almost completely (by 97%). Therefore, further research of newly synthesized compounds of thiazolopyridine derivatives is required and will provide an opportunity for in-depth understanding of the mechanisms of their biological effect on processes in cells, which will be of great importance for medicine.

Biography

Melnyk Oksana Volodymyrivna defended her PhD thesis in 2015. She works at the Department of Microbiology of the Danylo Halytsky Lviv National Medical University. She is the author of 45 scientific works, three patents of Ukraine for the utility model. She is the Co-author of 12 methodical recommendations for students of medical, dentistry and pharmaceutical faculties. She has performed scientific research on the grant of the President of Ukraine on, "Development and introduction of immuno-biochemical methods of early diagnosis of pathological processes in the body".

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