the synthesis of gold NPs as well as the simplicity and reliability of methods for modifying their surface by attaching oligonucleotides, peptides, polyethylene glycol and other biologically active components to them. Modified particles circulate longer in the bloodstream and are less affected by cellular components of the immune system. Today it is generally accepted that gold NPs conjugates are excellent labels for the diagnosis of cancer, Alzheimer's disease, AIDS, hepatitis, tuberculosis, diabetes mellitus and other diseases.

PREDICTION OF THE ANTI-INFLAMMATORY ACTIVITY OF NEW S-ALKYL DERIVATIVES OF 1,2,4-TRIAZOL-3-THIONES USING THE PASS COMPUTER PROGRAM AND MOLECULAR DOCKING

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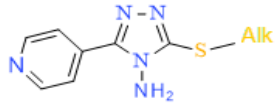
Introduction. Scientists refer the heterocyclic system of 1,2,4-triazole to the privileged structure since most of the derivatives of this heterocycle synthesized exhibit some pharmacological activity, including the anti-inflammatory one. A careful study of the literature data on the spectrum of pharmacological properties of the heterocyclic system of 1,2,4-triazole allows us to confidently assert that the presence of this cycle in the structure of substances determines the manifestation of the anti-inflammatory activity. Moreover, some studies suggest that the presence of the 1,2,4-triazole cycle causes selective inhibition of cyclooxygenase-2 (COX-2). Our analysis of the scientific literature has shown that despite a large number of publications devoted to functional derivatives of 1,2,4-triazole the pharmacological potential of this class of compounds at the present stage is not exhausted.

Aim. Search for selective COX-2 inhibitors based on the basic structure of 4-amino-3-thio-1,2,4-triazole. Modification of the base molecule and creation of a virtual library of S-derivatives of 5-substituted 4-amino(pyrol)-3-thio-4H-1,2,4-triazoles in an amount of 100 compounds (ten groups). Selection of six groups of promising compounds for further synthesis based on the analysis of the results of PASS-prediction and molecular docking.

Materials and methods. The introduction of different pharmacophore fragments into the molecule by modifying the thio group and obtaining S-derivatives of 5-substituted 4-amino(pyrrol)3-thio-4H-1,2,4-triazoles. The following ways of modification have been planned: alkylation of 5-pyridine-4-amino(pyrrol)3-thio-1,2,4- triazole derivatives by haloalkanes (**I**); introduction of the arylideneaniline fragment (**II**) to alkyl derivatives of group (**I**) ; oxidation of 5-(pyridine-4)-4-amino-3-thio-1,2,4-triazole derivatives to alkylsulfonyl derivatives (**III**); introduction of the 5-(pyridine-4)-4-amino-3-thio-1,2,4-triazole fragment of alkylurea (**IV**) into the basic structure; alkylation of 5-(pyridine-4(2,3))-4-amino-3-thio-1,2,4-triazoles (**V-VI)** by α-chloroacetamides; alkylation of 5-(furyl-2)-amino-3-thio-1,2,4-triazoles (**VII)** by α-chloroacetamides; replacement of the amino group in S-alkyl derivatives of 5-(pyridine-2,4)-4-amino-3-thio-*4H*-1,2,4-triazoles (**VIII-IX)** and 5-(furyl-2)-4-amino-3-thio-*4H*-1,2,4-triazoles (**X)** on the pyrrol residue.

The logical and structural assessment of the possible biological effect was performed using the PASS computer system *online*. In order to optimize the targeted search for COX-2 inhibitors as potential anti-inflammatory agents and substantiate the feasibility of the experimental screening for the anti-inflammatory activity the docking studies were also conducted. The docking studies of hypothetical compounds were conducted using a SCIGRESS software package (Fujitsu, Fukuoka, Japan (license 742F6852C191)).



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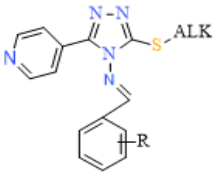

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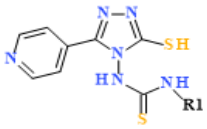

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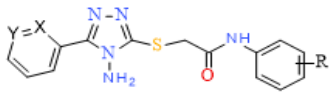

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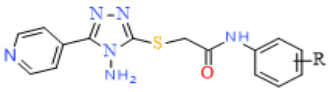

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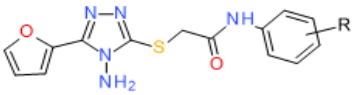
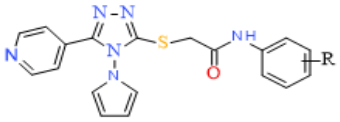
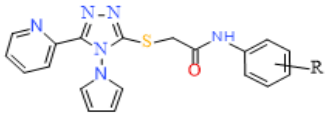


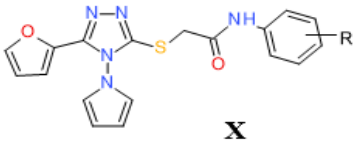
VII



VIII



IX



X

Results and discussion. According to the data of the PASS computer program on line are promising compounds of V-X groups. The values of scoring functions for almost all compounds in complexes with the COX-2 enzyme exceed the values of these functions for aspirin and diclofenac sodium. For group **VI** the average values of scoring functions exceed the values for celecoxib. Based on these data it has been determined that 4-amino-5-(pyridine-4-yl)-1,2,4-triazole (4H)-3-yl-thioacetamides and their pyrrol derivatives are characterized by the highest level of affinity calculated to all targets studied compared with other groups of compounds.

Conclusion. In order to search for potential anti-inflammatory agents 1,2,4-triazol-3-thiones have been selected as promising objects of chemical modification. Based on the results of the PASS-prediction and molecular docking, six of the ten planned groups of compounds have been selected for the synthesis as promising selective COX-2 inhibitors.

METHODS OF ACIDS SYNTHESIS FROM BICYCLIC MONOTERPENES

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Introduction. In the previous studies we have synthesized a number of biologically active derivatives of camphoric and 3-dichloromethyl-1,2,2-trimethylcyclopentanecarboxylic acids (compounds **1** and **2**, correspondingly) with diuretic, hypoglycemic and anticonvulsant activities. Both acids were obtained by cleavage camphor **3** and used for introduction of the 1,2,2-trimethylcyclopentanecarboxylic acid moiety into the target molecules. Therefore, it would be of practical use to study other available sources of producing similar acids and to analyze alternative methods of camphor transformation.