1255 cm^{-1}. When passing from the spectrum of dicarboxylic acid to the spectra of complexes with metals, the disappearance of the band of the carboxyl group and the appearance of two intense bands of the carboxylate group at 1580-1540 and 1435-1400 cm^{-1} are observed. This probably indicates substitution of hydrogen of the carboxyl group of the ligand on the metal. In the IR spectrum of sodium salt of 3-pyridine monocarboxylic acid Na(3-PMK-H), the stretching and planar deformation vibrations bands of the ring appear at 1592, 1570, 1035 cm^{-1}. During the transition from the spectra of Na (3-PMKH-H), Na(4-PMAH-H) to the spectra of their complexes, this band changes slightly, therefore, the anions of the acids are uncoordinated with the participation of the nitrogen heteroatom. In coordination is likely to oxygen atoms carboxylate group. Moreover, $\Delta\nu$(COO), i.e. the difference between ν_{as}(COO) and ν_{s}(COO) for Na(3-PMK-H), Na (4-PMK-H) and their complexes is 206, 190, 210 and 204 cm^{-1}, respectively. Characteristic for complexes intense band v (V = O) appears at 980 cm-1 and corresponds to the five states of the vanadium coordinating atom in complexes. According to derivatographic studies, the water molecules in the complex are external-sphere ones.

Conclusions. By IR spectroscopy and derivatography, it was established that ligands glutaric and 3,4-pyridine monocarboxylic acid are coordinated to the VO (II) bidentate in deprotonated form.

IN SILICO RESEARCH OF THE MOLECULAR MECHANISMS OF THE CARDIOPROTECTIVE EFFECT OF THE NEW 1,3-THIAZOLE DERIVATIVES

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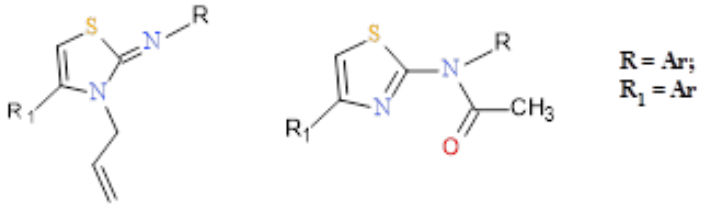
Introduction. One of the important directions of development of modern pharmaceutical chemistry is *in silico* study of possible mechanisms of action of new synthesized compounds on the cell and subcellular levels using a methodology for evaluating binding of ligands to probable biological targets. The use of this methodology allows to optimize the structures of "leader compounds"; to conduct a virtual screening to determine the affinity of compounds to a particular biological target; to model binding of the target ligand, taking into account the specificity of the interactions. The results obtained can be used in the future to substantiate the feasibility of conducting experimental screening.

Aim. Establishing the possibility of inhibition the catalytic activity of the angiotensin-converting enzyme by new derivatives of N-R-phenyl-2,3-dihydro-1,3-thiazole-2-imine and the selection of leader compounds promising for experimental researches.

Materials and methods. Docking studies were conducted for 21 substances of derivatives of N-R-phenyl-2,3-dihydro-1,3-thiazole-2-imine. Test compounds were divided into 2 main groups taking into account the chemical structure:



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Autodock 4.2.6 was used for the receptor-oriented flexible docking. Preparation of ligands was carried out using Vega ZZ (command line) and MGL Tools 1.5.6. programs. The active center of the macromolecule from the Protein Data Bank (PDB) of the angiotensin-converting enzyme (PDB ID: 4BZR) was used as a biological target for docking. Visual analysis of complexes of substances with bio target was conducted using Discovery Studio Visualizer 4.0.

Results and discussions. According to the results of the conducted molecular docking, the scoring function values were calculated. For all tested compounds in complexes with the angiotensin-converting enzyme, they have negative values (EDoc = from -6.98 to -8.20 kcal/mol), indicating that they can exhibit

inhibitory activity with respect to the angiotensin-converting enzyme. A conducted detailed analysis of the geometric location of the molecules of the synthesized substances in the active site of the angiotensin-converting enzyme indicates that the formation and stability of the complexes between them is provided mainly due to the energetically favorable geometric location of the ligands in the active center of this acceptor, the formation of hydrogen bonds between them, intermolecular electrostatic and donor-acceptor interactions. It should be noted that the representatives of the second group, which combine active scaffolds such as 4-R-phenyl-1,3-thiazole and 2-R-phenylacetamide in the molecule, have the best affinity for this target.

Visualization of the results of molecular docking of the leader compounds is presented in Fig. 1

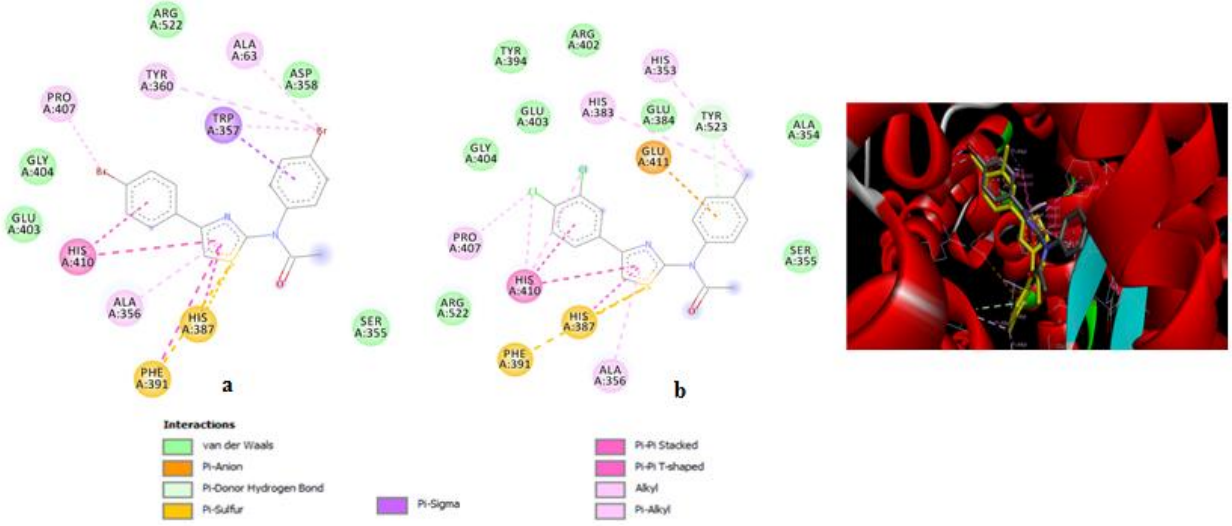

Fig. 1. Superposition and diagrams of interactions of ligands in complexes with angiotensin-converting enzyme (PDB ID: 4BZR) for leader compounds.

Conclusions. According to the results of molecular docking, it has been found that the inhibitory activity of the synthesized compounds with respect to the angiotensin-converting enzyme (ACE) can be realized by forming complexes between them, the stability of which is provided mainly due to the energy-favorable geometric location of the ligands in the active center of this acceptor, the formation of hydrogen bonds between them, electrostatic and donor-acceptor interactions. As a consequence, the thermodynamic probability of such binding is confirmed by the negative values of the scoring function. For experimental screening for antihypertensive activity, a promising group of compounds has been selected containing such active scaffolds as 4-R-phenyl-1,3-thiazole and 2-R-phenylacetamide.

THE APPROACHES FOR CONSTRUCTION OF PEPTIDOMIMETICS WITH THE HELP OF COUPLING-REAGENTS

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Introduction. In the last years, the number of the reported peptidomimetics as the drug-candidates increases. Peptidomimetics are small protein-like molecules.

Aim. There are many methods for preparation of peptides and their mimetics, which use the coupling reagents for the synthesis and our aim was to choose the most convenient of them.

Materials and methods. The information form the open Internet sources.

Results and discussion. The racemization is the side reaction of many of these synthetic processes. To avoid this the different reagents can be applied each of them is suitable for peptide synthesis and prevents racemization in the different cases. The following coupling reagents are known: 1)