THE STUDY OF 2-((4-CHLORO-1-ETHYL-2,2-DIOXIDO-1*H*-BENZO[*C*][1,2]THIAZIN-3-YL)METHYLENE)MALONONITRILE INTERACTION WITH 2-R^1-5-R^2-1,2-DIHYDRO-3*H*-PYRAZOL-3-ONES

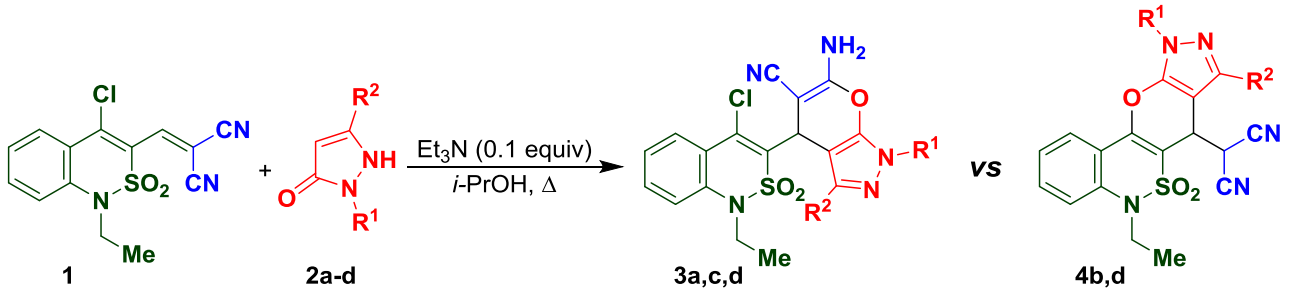
Kolodiazhna T. I., Lega D. A.
Scientific supervisor: Shemchuk L. A.
National University of Pharmacy, Kharkiv, Ukraine
tatianaevt23@gmail.com

Introduction. Often interaction between □,□-unsaturated nitriles and 1,3-*O*,*C*-dinucleophiles is a straight way to 2-amino-4*H*-pyran core. Nevertheless, sometimes outcome of the reaction is not obvious and predictable as dinucleophiles can react with polyfunctionalized substrates in various ways. This fact makes investigation of such reactions interesting but challenging task.

Aim. To isolate the products of 2-((4-chloro-1-ethyl-2,2-dioxido-1*H*-benzo[*c*][1,2]thiazin-3-yl)methylene)malononitrile interaction with 2-R^1-5-R^2-1,2-dihydro-3*H*-pyrazol-3-ones and to confirm their structure.

Materials and methods. Standard methods of organic synthesis were applied in the research. Structure elucidation involved ^{1}H and ^{13}C NMR spectroscopy, IR spectroscopy as well as HPLC-MS method. 2-((4-Chloro-1-ethyl-2,2-dioxido-1*H*-benzo[*c*][1,2]thiazin-3-yl)methylene)malononitrile and 2-R^1-5-R^2-1,2-dihydro-3*H*-pyrazol-3-ones were used as starting materials.

Results and discussion. Interaction of dinitrile **1** with pyrazolones **2a,c** in *i*-PrOH in the presence of catalytic amounts of triethylamine resulted in expected 2-amino-4*H*-pyran heterocyclic system **3a,c** as it was confirmed by NMR, IR and MS experiments. Unexpected result was obtained while using 3-methylpyrazol-5-one (**2b**). Despite our expectations 2-amino-4*H*-pyran **4p** was not isolated as ^{1}H NMR spectrum of the reaction product did not contain a signal of 2-amino group and 4-H pyran proton of 4*H*-pyran ring. Taking into account the fact that compounds **1** and **2b** contain several electrophilic centers, one can predict another cyclization way involving nucleophilic substitution of Cl atom. Considering the data of the instrumental methods of analysis obtained as well as results of ^{1}H NOESY experiments the structure of the product was assigned to tetracyclic condensed system of **4b**. While utilizing 5-phenylsubstituted pyrazolone **2d** a mixture containing products **3** and **4** was isolated. We managed to isolate pure 2-amino-4*H*-pyran **3d** based on different solubility of the products in *i*-PrOH.



a: R^1 = Ph, R^2 = Me; **b**: R^1 = H, R^2 = Me; **c**: R^1 = H, R^2 = CF$_3$; **d**: R^1 = H, R^2 = Ph

Conclusions. Relationship between the structure of starting pyrazolones **2** and the outcome of the reaction is blur by now and the only conclusion we can make is that the presence and the nature of substituents in pyrazolone unit are crucial factors determining the direction of the reaction.