



**UKRAINE, Zaporizhzhia**  
**Zaporizhzhia National University**



# **LABORATORY FOR BIOTECHNOLOGY OF PHYSIOLOGICAL ACTIVE SUBSTANCES**

**Assoc. prof., Dr. Maryna M. Kornet**

Head, Laboratory for Biotechnology of  
Physiologically Active Substances; Associate  
Professor, Department of Chemistry ZNU

**2022**

# About Ukraine by Dorosh



## About Zaporizhzhia



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# About Faculty of Biology

# About Department of Chemistry



# About Laboratory for Biotechnology Of Physiological Active Substances



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Head, Laboratory for Biotechnology  
of Physiologically Active Substances

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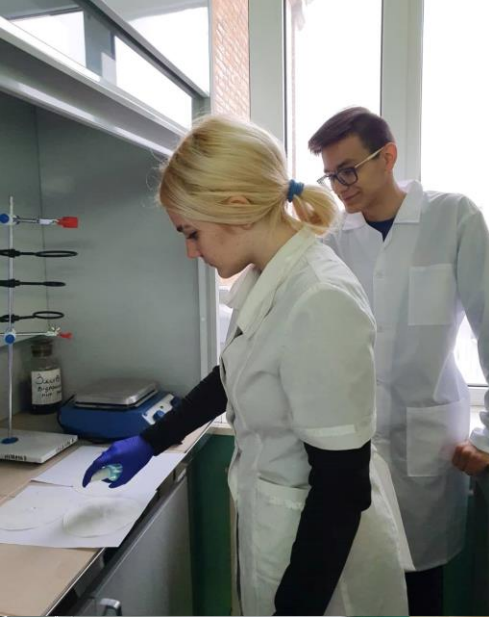




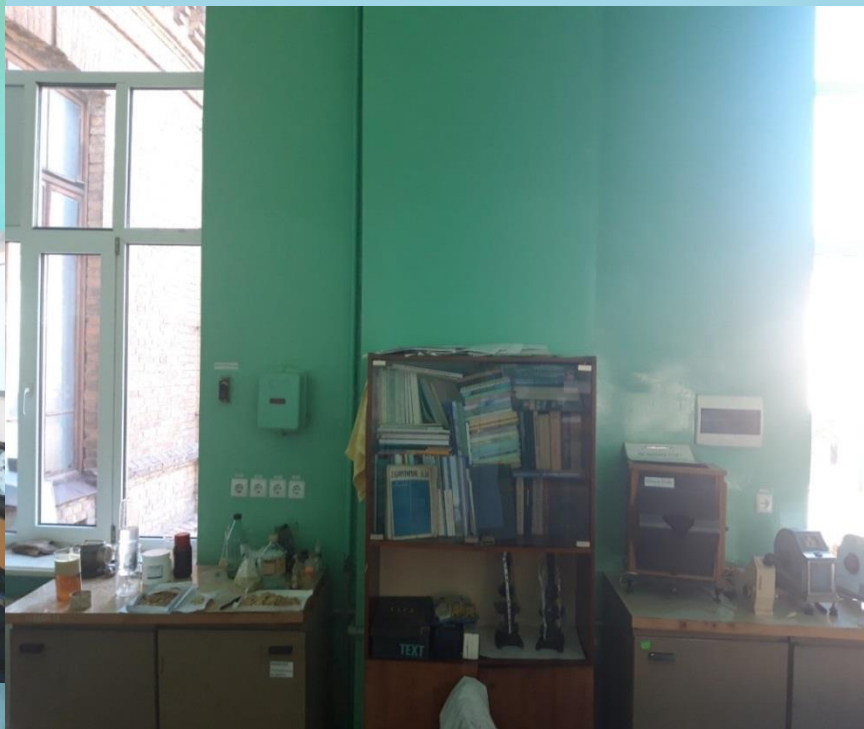








*This lab was two years ago.*



# RESEARCH LABORATORY FOR "BIOTECHNOLOGY OF PHYSIOLOGICALLY ACTIVE SUBSTANCES"

**Basic direction of work -  
search for new bioregulators among the natural and synthetic compounds.**

## ***Examples of research:***

- 1. Creating a virtual combinatorial libraries and screening of potential biologically active substances.**
- 2. Carrying out computer prediction of the biological effects of the compounds.**



- 3. Synthesis and identification, determination of physicochemical constants azaheterocycles derivatives .**
- 4. Testing of new materials at the various levels (*in vitro*, *in vivo*, microorganisms, plants, animals).**
- 5. Determination of correlations "structure - property - biological action".**
- 6. The selection of the most promising substances for in-depth biological research, development laboratory regulations and effective dosage forms.**



## **BIOLOGICAL RESEARCHES:**

### 1) The molecular level

- Antiradical activity

### 2) The cell level

- The cytoprotective activity

### 3) In isolated organs and cell groups

- Antioxidant activity (enzymatic and non-enzymatic initiation of free radical oxidation)
- Membrane stabilizing activity

### 4) *On the intact organisms*

- The antimicrobial activity
- Acute toxicity chemical
- Hepatoprotective activity
- Radioprotective activity
- Cytotoxic Activity
- The anti-inflammatory effect
- The analgesic effect



**Total staff number of laboratory - 7**

**Processor - 1**

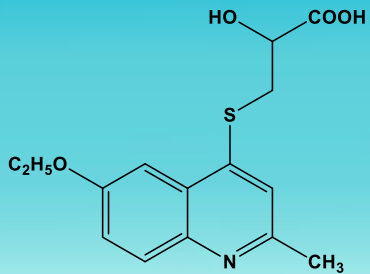
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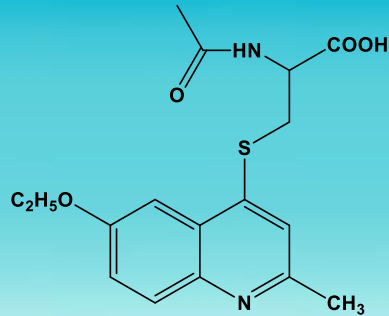
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# Physiologically active compounds with an antioxidant mechanism of activity developed by laboratory staff:

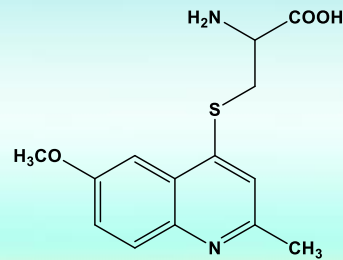
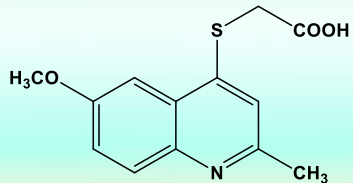
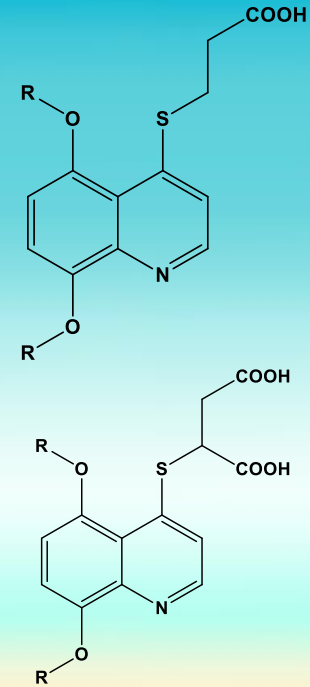
## Cerebroprotective action



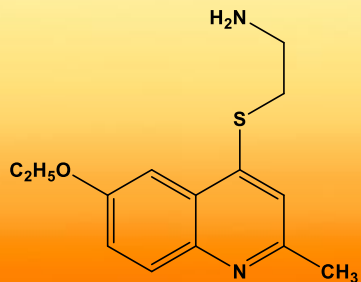
## Hepatoprotective action



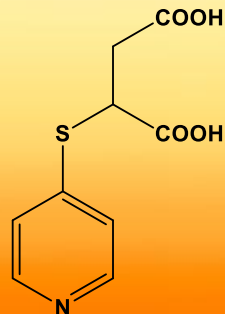
## Neuroprotective action



## Radioprotective action



## Nootropic action



# Research is supported by a DAAD scholarship:

## «SYNTHESIS OF S,N-MODIFIED AMINOTHIOLS AS POTENTIAL ANTI-RADIATION AGENTS»

### Description of the Research Plan

The main goal of this project is to solve applied problems of modern chemistry related to the preparation of organic compounds with potential antioxidant and radioprotective properties.

The main objects of the research are 2-(quinolin-4-ylthio)ethanamine, which are effective "traps" of free radicals (Fig. 1).

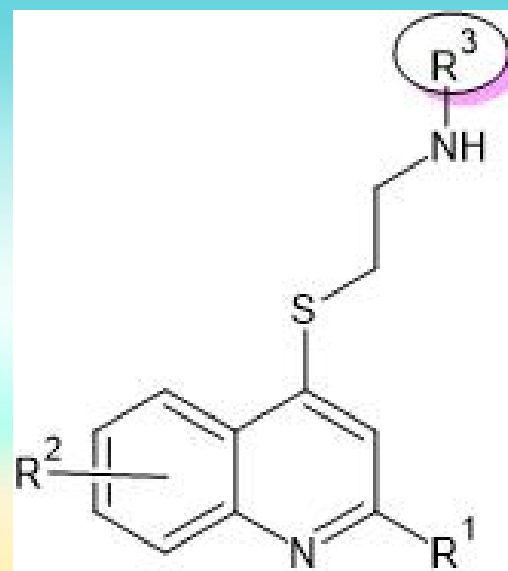


Figure 1. Objects of the research

R<sup>1</sup>=H, CH<sub>3</sub>

R<sup>2</sup>=H, 6-OCH<sub>3</sub>, 6-OC<sub>2</sub>H<sub>5</sub>, 7-Cl

R<sup>3</sup>= C(O)CH<sub>3</sub>, C(O)CH<sub>2</sub>CH<sub>2</sub>COOH, C(O)C<sub>6</sub>H<sub>5</sub>



# What Zaporizhzhia National University is doing now:



As an envoy of my university the Zaporizhzhia National University, I proudly share the efforts of our co-workers not only to perform online teaching and continue research activities, but also to help our country. **Our university functions also as a humanitarian aid hub dispensing help to the people in need and a volunteer centre** (see below for an account of our activities).

We express our heartfelt gratitude to international partners, organizations, foundations, charities and institutions willing to support our university and our struggle for peace.

If you know of special funding opportunities, which could help the scientific and higher-educational community of Ukraine, and particularly if you could help to actualize them, we ask for your help (please, send the info to my E-mail address: [kornetmarina77@gmail.com](mailto:kornetmarina77@gmail.com) or official E-mail of ZNU management: [znu@znu.edu.ua](mailto:znu@znu.edu.ua)).

*Personal or institutional donations to the University of Zaporizhzhia would also be highly appreciated (the account numbers, either in EUR and USD are given on the website of our university, <https://www.znu.edu.ua/2022/4559.ukr.html>:*

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## Why is our struggle important and why is it important to help us

My entire country, my Ukrainian compatriots, are now in a struggle to preserve our land and protect the democratic values we support. Most Ukrainians want to develop their own independent land, to build their own society. During the years, we have made some progress noted by visitors from abroad. Our beautiful country is actively working on its future, on the ability of our children to choose their destiny, a choice based on free elections following the European standards. Unfortunately, Russia has other plans for Ukraine and also has much more resources to follow their plans. That is why Ukrainians are now very grateful for any help we can get to be able to resist.

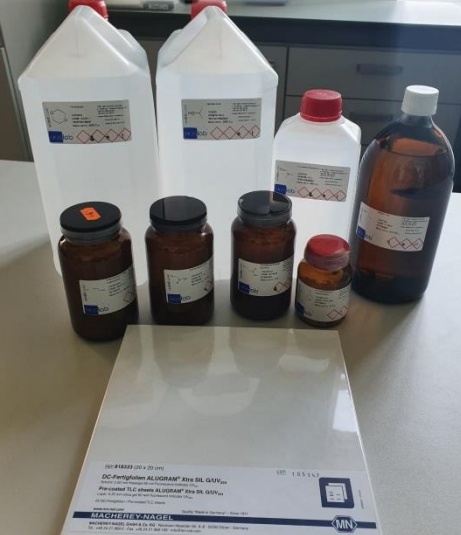
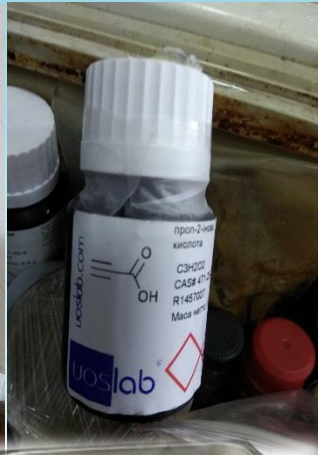
Zaporizhzhia National University, where I work, is located a few tens of kilometres from the borders of the territories controlled by the Ukrainian government. The university not only continues to fulfil its primary teaching tasks, but it has also become a centre for volunteer assistance. Every day, our city is the first to meet thousands of refugees who have been forced to flee their homes, flee from war. Our university uses its resources to purchase and provide food and medicine for these people; also many people are accommodated in the university dormitory; various forms of assistance are provided. Therefore, any help that our university can receive now, including informational support (particularly spreading the information about us in the media), is very important and valuable. More information about our dedicated service is given on the informational site of the management of Zaporizhzhia National University (<https://www.znu.edu.ua/2022/4559.ukr.html>).



**Thank you for your attention!**



# Обсяг фінансування на матеріали та реактиви на 2019-21 рік – 426 442, 0 грн.



# Обсяг фінансування на відрядження – 23860,00 грн., дозволив:

13 відряджень до науково-технічного комплексу «Інститут монокристалів» Національної академії наук України та державної установи «Інститут медичної радіології ім. С.П. Григор'єва» Національної академії медичних наук України за **(м. Харків)** для виконання робіт в рамках держбюджетної НДР, Інституту біоорганічної хімії та нафтохімії ім. В.П. Кухаря НАН України **(м. Київ)**, Східноєвропейського національного університету імені Лесі Українки **(м. Луцьк)** для прийняття участі у роботі XXV Української конференції з органічної і біоорганічної хімії, XII Міжнародної виставки LABComplex. Аналітика. Лабораторія. Біотехнології. HI-TECH **(м. Київ)**, *Всеукраїнської конференції наукових дослідників (м. Львів)*, *Всеукраїнський симпозиум з органічної та медичної хімії, присвячений 80-річчю проф. Валерія Дмитровича Орлова.*

