

GENERAL INFORMATION

1. NAME OF THE CENTER AND LOCATION

NAME: **SCIENTIFIC RESEARCH LABORATORY IN CHEMISTRY**

Location **OF NATURAL COMPOUNDS**

South-West University “Neofit Rilski”, Blagoevgrad 2700, Ivan Mihajlov str.66
Faculty of Natural Science and Mathematics, Department of Chemistry

2. TYPE OF THE RESEARCH INFRASTRUCTURE AND/OR SCIENTIFIC EXPERTISE

Identify the type of the RI, equipment/facilities/specific research, and in particular linked to COVID-19:

Scientific equipment for biomedical and pharmaceutical research & development
Scientific equipment for synthesis and purification of newly compounds are included in the **“SCIENTIFIC RESEARCH LABORATORY IN CHEMISTRY OF NATURAL COMPOUNDS” at South-West University “Neofit Rilski”**. The laboratory has at its disposal a high performance liquid chromatography apparatus "Knauer", flash chromatography system Buchi,

The structures of compounds will be confirmed by various analytical methods- UV, IR and others. They will be recorded on polarimeter Polax-2, FT-IR spectrometer "Thermo Scientific iD5 Diamond ATR Nicolet iS5", spectrophotometer „Agilent co“ model 8543.

In the Institute of Mineralogy and Crystallography "Acad. Ivan Kostov", BAS there are X-ray powder diffractometer D2 Phaser BrukerAXS, Cu radiation (2009), 86400 X-ray single crystal diffractometer Enraf-Nonius CAD-4 (1985), Powder diffractometers DRON-UM1 and DRON-3M with PC-based system for phase identification (1985), X-ray single crystal diffractometer Supernova A, Oxford diffraction.

Scientists from **“SCIENTIFIC RESEARCH LABORATORY IN CHEMISTRY OF NATURAL COMPOUNDS”** at the South-West University “Neofit Rilski” have gained a lot of experience and valuable knowledge in the field of chemical transformation of drugs (anti-herpes and anti-influenza drugs). The latters were tested against various influenza strains e.g. A/Fort Monmouth/1/1947(H1N1), clinical isolated Influenza strains A/Wuhan/359/1995(H3N2) and A/Jinnan/15/2009(H1N1, resistant to oseltamivir), and others.

3. TYPE OF THE RESEARCH

Provide information on the research carried on or planned in regard with COVID-19 and other viruses

The World Health Organization has listed Favipiravir, as part of its experimental protocol for potential treating the disease, caused by Covid-19. Due to expected mutation of Covid-19 and appearance of resistance against this acute pathogen, we plan to modify favipiravir by chemical transformations with amino acids and polyamines. By incorporation of those additional functional groups we aim to “resuscitating” the antiviral properties of this molecule.

4. WEBSITE

Provide the internet address:

www.swu.bg

5. BACKGROUND, PUBLICATIONS AND OPEN DATA REPOSITORY

leading research team AND Scientific publications of the research group on the topics of related to coronaviruses research results;

link to open data repository

1. Chayrov, R., Tencheva, A., Sbirikova-Dimitrova, H., Shivachev, B., Kujumdzieva, A., Nedeva, T., Stankova, I., Synthesis, Antibacterial, and Antifungal Activities of Hybrid Molecules Based on Alzheimer Disease Drugs and Bearing an Amino Acid Fragment, In Multidisciplinary Digital Publishing Institute Proceedings, 14 November 2019, <https://doi.org/10.3390/ecsoc-23-06602> ;

2. Stankova, I., Chayrov, R., Kalfin R., Tancheva L., Aleksandrova A., Lazarova M., Adamantane analogue with antiviral and anti-Parkinsonian activity, Patent application 112806/25 September 2018, Patent office of Republic of Bulgaria;

3. Hristov, G., Stankova, I., Chemical stability of new acyclovir analogues with peptidomimetics, Scientia pharmaceutica, 5 March 2011, <https://doi.org/10.3797/scipharm.1012-20>

4. Stankova, I., Chuchkov, K., Chayrov, R., Mukova, L., Galabov, A., Marinkova, D., Danalev, D., Adamantane Derivatives Containing Thiazole Moiety: Synthesis, Antiviral and Antibacterial Activity, International Journal of Peptide Research and Therapeutics, 22 November 2019, <https://link.springer.com/article/10.1007/s10989-019-09983-4>

5. Chochkova M. G., Georgieva A. P., Ivanova G. I., Nikolova N., Nikolaeva-Glomb L., Milkova Ts. S.

Synthesis and biological activity of hydroxycinnamoyl containing antiviral drugs. J. Serb. Chem. Soc., 79, 17–526 (2014).

<https://doi.org/10.2298/JSC130222103C>

6. Spasova M, Philipov S, Nikolaeva-Glomb L, Galabov AS, Milkova Ts.

Cinnamoyl- and hydroxycinnamoyl amides of glaucine and their antioxidative and antiviral activities.

Bioorg Med Chem. 2008;16(15):7457-61.

<https://doi.org/10.1016/j.bmc.2008.06.010>

6. COORDINATOR

Full name of the coordinator organization: **South-West University "Neofit Rilski", Blagoevgrad**

Contact person: **Assoc. Prof. Ivanka Stankova, PhD**

e-mail ivastankova@abv.bg

7. POSSIBLE PARTNERS

Indicate the partner organizations

Full name of the partner

Institute of mineralogy and crystallography "Acad. Ivan Kostov", Bulgarian Academy of Sciences, Sofia

Contact person;

Prof. Boris Shivachev, PhD

e-mail: bls@bas.bg

Full name of the partner

University of Chemical Technology and Metallurgy, Sofia

Contact person;

Assoc. Prof. Dancho Danalev, PhD

e-mail: dancho.danalev@gmail.com

8. IMPLEMENTED AND RUNNING PROJECTS

Projects related to virology, vaccines, infection diseases ...

1. Design of new triple-acting agents in bacterial infection, Alzheimer's disease and cancer (submitted- **project acronym:** RUS_ST2019-404);
2. “Derivatives of anti-influenza drugs-synthesis and biological activity”- DMU 03/2013
3. Chemical transformations and activity of some antiviral drugs, DAAD -03/2007; 7;
4. Synthesis, biological activity and mathematical models for computer stimulation of new antiviral drug derivatives НИР-Н9/Д-1; 2009;
5. Experimental and theoretical study of antioxidant, antiviral and antimicrobial activity of new analogues of phenolic acids SRP-C2/2010 НИР;
6. “Chemical transformation, biological activity and mathematical models of approved anti-viral drugs” SRP-A7/11