# ID CARD

## RESEARCH GROUPS OF FACULTY OF PHARMACY


Министарство просвете, науке и технолошког развоја

European Commission

Co-funded by the Erasmus+ Programme of the European Union

COST

JRC

REPUBLIC OF SERBIA
INNOVATION FUND

Science Fund of the Republic of Serbia

UNIVERSITY OF BELGRADE

FACULTY OF PHARMACY


- ***Above 80 years*** *of a high-level education.*
- *Part of the University of Belgrade,* ***the oldest one*** *in Republic of Serbia.*
- *A* ***long tradition*** *in research in several scientific fields.*
- *In the subject of Pharmacy & Pharmaceutical Sciences, University of Belgrade was* ***among 200 best universities*** *in 2018 (Shanghai Ranking's), and among 500 best universities in 2020, scored by the No of publications in Q1 scientific journals.*

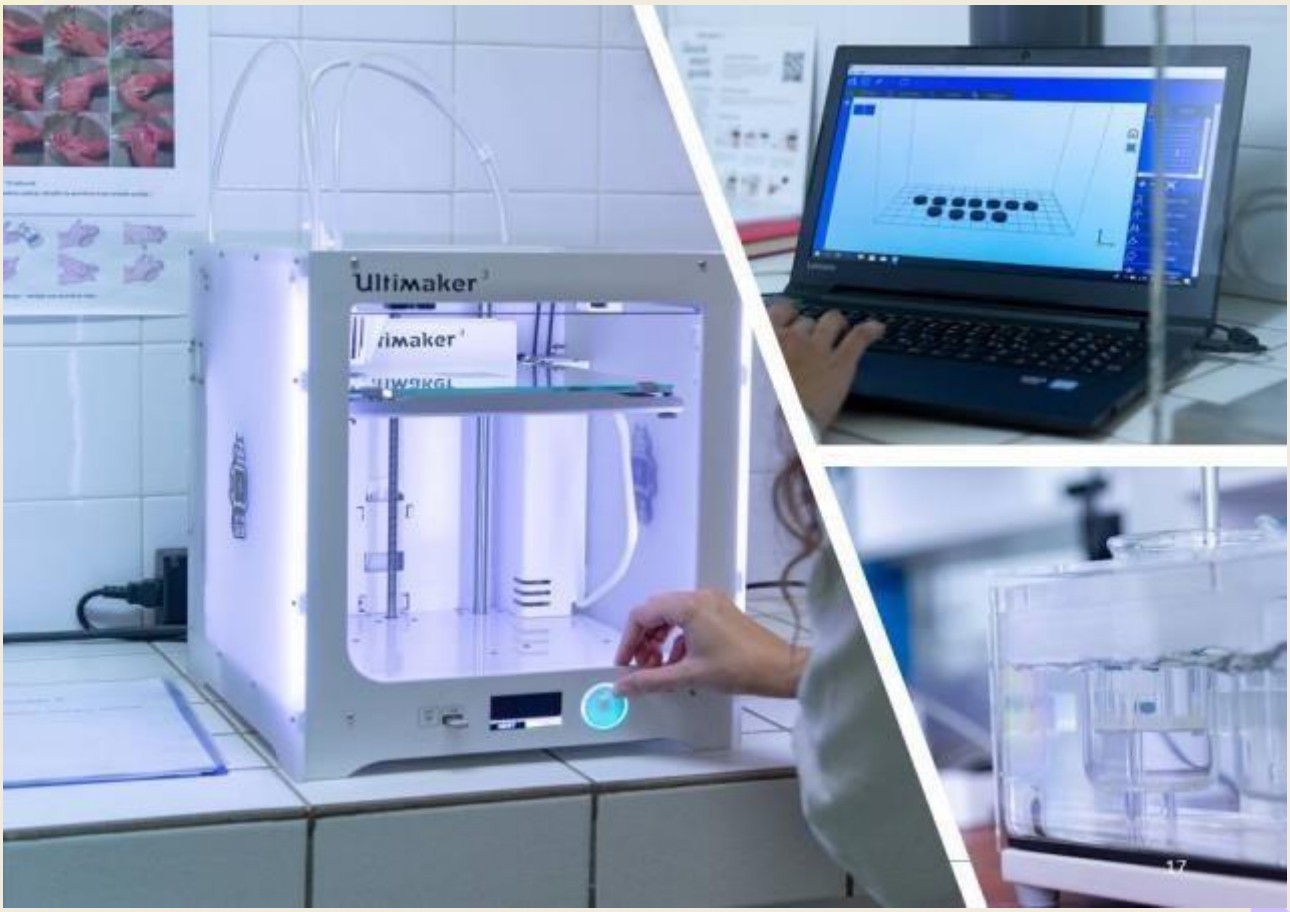
***Department of Pharmacy*** *was first founded at the Faculty of Medicine of University of Belgrade on 24 October 1939.* ***The Faculty of Pharmacy*** *became an independent higher education institution on 19 October 1945. For a number of years the courses were taught in the facilities of the Faculty of Medicine, and in September 1991 the Faculty of Pharmacy moved to its own building.*

# Equipment

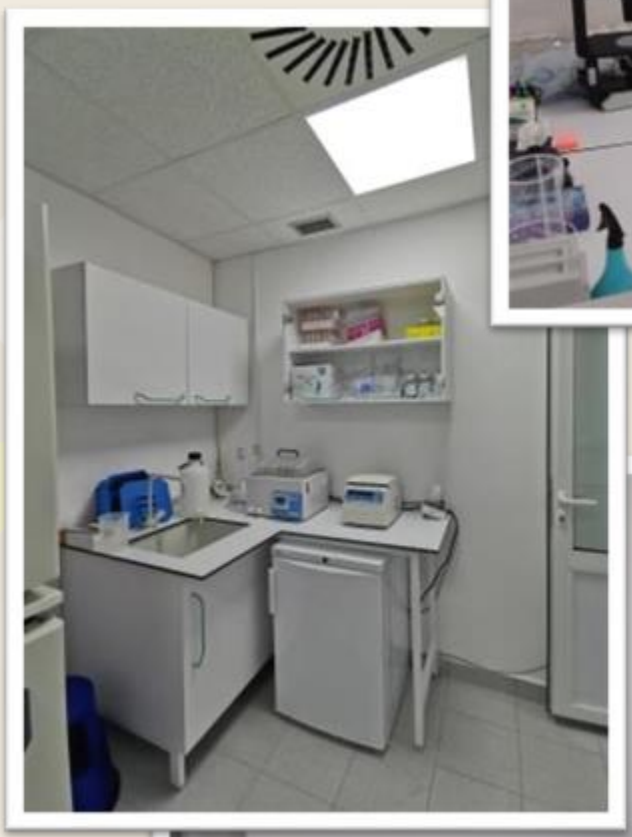
Equipment catalogue (link)



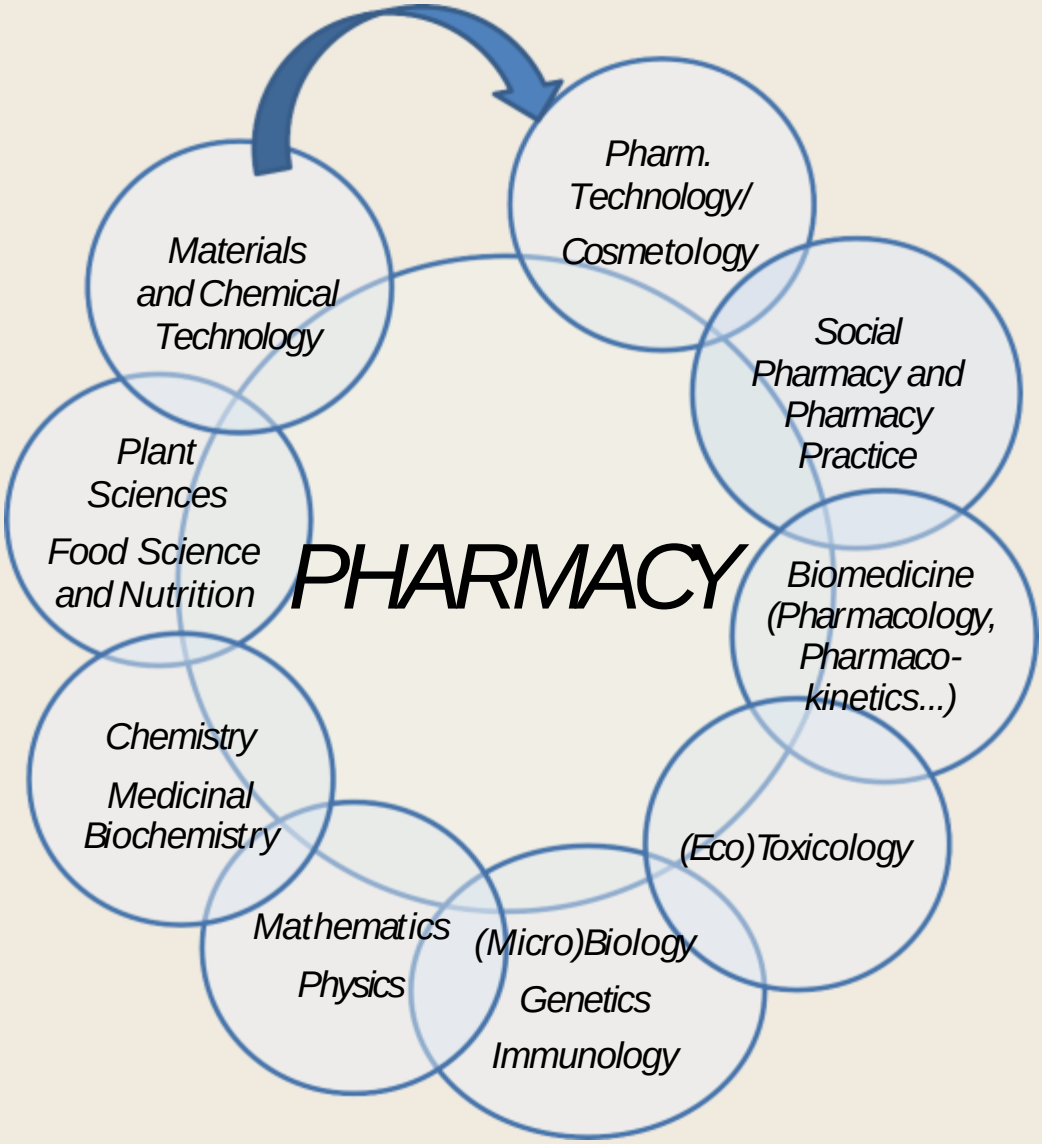
19


Ultimaker
17

# *Center for Stem Cell Research and Drug Development…*



# Research areas



# Research groups (RG)

RG Prof. Anđelija Malenović (Drug Analysis)
RG Prof. Slađana Šobajić (Bromatology)
RG Assoc. Prof. Katarina Nikolić (Pharmaceutical Chemistry)
RG Prof. Slavica Erić (Pharmaceutical Chemistry)
RG Asst. Prof. Vladimir Dobričić (Pharmaceutical Chemistry)
RG Prof. Snežana Savić (Pharmaceutical Technology and Cosmetology)
RG Prof. Svetlana Ibrić (Pharmaceutical Technology and Cosmetology)
RG Prof. Nada Kovačević (Pharmacognosy)
RG Prof. Branislava Miljković (Pharmacokinetics and Clinical Pharmacy)
RG Prof. Miroslav Savić (Pharmacology)
RG Prof. Radica Stepanović-Petrović (Pharmacology)
RG Assoc. Prof. Aleksandra Janošević-Ležaić (Physical Chemistry)
RG Prof. Neli Kristina Todorović Vasović (Physics and Mathematics)
RG Asst. Prof. Marin Jukić (Physiology)
RG Prof. Vesna Pešić (Physiology)
RG Prof. Svetlana Ignjatović (Medical Biochemistry)
RG Prof. Jelena Antić Stanković (Microbiology)
RG Prof. Vladimir Savić (Organic Chemistry)
RG Prof. Biljana Spremo-Potparević (Pathobiology)
RG Prof. Gordana Leposavić (Pathobiology)
RG Prof. Dušanka Krajnović (Social Pharmacy)
RG Prof. Biljana Antonijević (Toxicology)
RG Asst. Prof. Aleksandra Buha Đorđević (Toxicology)

# International Research Projects

University of Belgrade - Faculty of Pharmacy is/was involved in realization of:

- **2** projects from the program **Horizon 2020** (Prof. Miroslav Savić, Asst. Prof. Marin Jukić),
- **27 COST** (European Cooperation in Science and Technology) actions (link),
- **1 Research and development project with People's Republic of China** (Assoc. Prof. Danijela Đukić Ćosić/RG Prof. Biljana Antonijević)
- **2 CEEPUS** (Central European Exchange Program for University Studies) projects (Prof. Jelena Kotur Stevuljević, Prof. Jelena Parojčić),
- **3 JRC** (Joint Research Centre) projects (Prof. Snežana Savić),
- **1 FDA-supported** project (Assoc. Prof. Sandra Cvijić/RG of Prof. Svetlana Ibrić),
- **6** bilateral projects with **Federal Republic of Germany** (Prof. Snežana Savić, Assoc. Prof. Ana Protić, Prof. Svetlana Ibrić),
- **4** bilateral projects with **Republic of Slovenia** (Asst. Prof. Vladimir Dobričić, Assoc. Prof. Biljana Otašević, Assoc. Prof. Danijela Đukić-Ćosić, Assoc. Prof. Katarina Vučićević),
- **3** bilateral projects with **Republic of Austria** (Prof. Brižita Đorđević and Asst. Prof. Nevena Ivanović, Prof. Miroslav Savić),
- **2** bilateral projects with **People's Republic of China** (Prof. Aleksandra Novaković, Assoc. Prof. Sandra Cvijić/RG of Prof. Svetlana Ibrić),
- **1** bilateral project with **Republic of France** (Assoc. Prof. Katarina Nikolić),
- **1** bilateral project with **Republic of Italy** (Prof. Biljana Potparević),
- **1** bilateral project with **Republic of Croatia** (Prof. Biljana Antonijević),
- **1 Deutsche Forschungsgemeinschaft** (DFG) project (Assoc. Prof. Katarina Nikolić),
- **ERASMUS+** (link) i **ReFEEHS** (link) projects.

# National Research Projects

University of Belgrade – Faculty of Pharmacy was a coordinator of **15 national research projects** funded by the Ministry-RS: 12 projects in the field of basic research and 3 projects in the field of technological development; in addition, our teaching/research staff was involved into **32 national research projects** led by some other scientific institution (basic research, technological development, interdisciplinary research): **currently, supported by Ministry of Education, Science and Technological Development through institutional funding of Faculty of Pharmacy as accredited Scientific Research Organization (SRO).**

Министарство просвете,
науке и технолошког развоја

*More than 150 researchers from the teaching personnel, and 39 researchers, mostly PhD students, are involved in the National Research.*

# National Research Projects

University of Belgrade - Faculty of Pharmacy is/was involved in realization of:

- **4 projects** from the **Proof of Concept** program of The Innovation Fund of the Republic of Serbia (Assoc. Prof. Marina Odalović, Prof. Zorica Vujić, Prof. Snežana Savić, Prof. Vesna Spasojević Kalimanovska),
- **4 projects** from the **Serbian Science and Diaspora Collaboration** program of The Science Fund of the Republic of Serbia (Prof. Gordana Leposavić, Assoc. Prof. Brankica Filipić, Assist. Tamara Gojković, Prof. Vladimir Savić),
- **2 projects** from the **PROMIS** (Program for excellent projects of young researchers) program of The Science Fund of the Republic of Serbia (Asst. Prof. Marin Jukić, Asst. Prof. Aleksandra Buha Đorđević),
- **1 project** from the **Collaborative Grant Scheme Program** of The Innovation Fund of the Republic of Serbia (Prof. Vladimir Savić),
- **1 project** of **The Center for the Promotion of Science** (Assoc. Prof. Brankica Filipić, Asst. Prof. Aleksandra Buha Đorđević and Asst. Prof. Ivan Jančić),
- **project** within ***Pokreni se za nauku*** **initiative** (Asst. Prof. Marin Jukić),
- **2 innovation vouchers** (Prof. Marina Milenković, assist. Tamara Gojković, PhD).

Фонд за науку Републике Србије

REPUBLIKA SRBIJA FOND ZA INOVACIONU DELATNOST

ЦЕНТАР ЗА ПРОМОЦИЈУ НАУКЕ

# RESEARCH GROUP
# PROF. ANĐELIJA MALENOVIĆ

## D R U G  A N A L Y S I S

| | |
|---|---|
| Research topic title: | Modelling of analytical and bioanalytical systems for the characterization of pharmacologically active compounds |
| RG members: | Dr. Anđelija Malenović, Full Professor<br>Dr. Mira Zečević, Full Professor<br>Dr. Biljana Otašević, Associate Professor<br>Dr. Ana Protić, Associate Professor<br>Dr. Aleksandra Janošević Ležajić, Assistant Professor<br>Mr. Pharm. Nevena Đajić<br>Mr. Pharm. Jovana Krmar<br>Mr. Pharm. Marija Rašević<br>Mr. Pharm. Milena Rmandić<br>Mr. Pharm. Bojana Svrkota |
| Equipment and methods: | 1. HPLC system Finnigan Surveyor Thermo Scientific<br>2. Waters Acquity; H-Class core systems, Waters Xevo™ TQD<br>3. Dionex Ultimate 3000 (U)HPLCsystem equipped with Corona Charged Aerosol Detector (ThermoFisher Scientific, USA)<br>4. Thermo Scientific Accela UPLC system (Thermo Fisher Scientific USA)<br>5. Thermo Scientific TSQQuantum Access Max (Thermo Fisher Scientific, Inc, CA, USA) equipped with triple quadrupole |
| Projects/ funding: | Chemometrically supported study of Charged Aerosol Detector (bilateral project with Germany, University of Würzburg) |
| Collaborations: | • Intensive and fruitful collaboration with assoc. prof. Yannis Dotsikas, Laboratory of Pharmaceutical Analysis, Department of Pharmacy, National and Kapodistrian University of Athens, Athens, Greece.<br>• Collaboration with prof. dr Ulrike Holzgrabe, University of Wurzburg, Institute of Pharmacy and Food Chemistry, Germany.<br>• Collaboration with prof. dr Borut Štrukelj, Chair for pharmaceutical biology, University of Ljubljana, Slovenia |

# RESEARCH GROUP
# PROF. ANĐELIJA MALENOVIĆ

## Selected publications


Rmandić M, Malenović A. Chaotropic chromatography method development for the determination of aripiprazole and its impurities following analytical quality by design principles. J. Sep. Sci. 2020; 43:3242–3250. Chemistry – Analytical category (32/86), M22, IF 2.878

Rmandić M, Dotsikas Y, Malenović A. Identification of the factors affecting the consistency of DBS formation via experimental design and image processing methodology. Microchemical J. 2019; 145: 1003-1010. Chemistry – Analytical category (19/86), M21, IF 3.594

Čolović, J., Rmandić, M., Malenović, A.: Characterization of bonded stationary phase performance as a function of qualitative and quantitative chromatographic factors in chaotropic chromatography. Anal. Bioanal. Chem. 2018; 410: 4855-4866. Chemistry – Analytical category (18/84), M21, IF 3.286

Ilioua, K., Malenović, A., Loukas, Y., Dotsikasa, Y.: Analysis of potential genotoxic impurities in rabeprazole active pharmaceutical ingredient via Liquid Chromatography-tandem Mass Spectrometry, following quality-by-design principles for method development. J. Pharm. Biomed. Anal. 2018; 149: 410-418. Chemistry – Analytical category (24/84), M21, IF 2.983

Čolović, J., Kalinić, M., Vemić, A., Erić, S., Malenović, A.: Influence of the mobile phase and molecular structure parameters on the retention behavior of protonated basic solutes in chaotropic chromatography. J Chromatogr A. 2017; 1511: 68-76. Chemistry – Analytical category (13/81), M21, IF 3.716

Šljivić J, Protić A, Malenović A, Otašević B, Zečević M. Simple and efficient solution for robustness testing in gradient elution liquid chromatographic methods. Chromatographia 2018 August; (81): 1135-1145. (Chemistry, Analitical, IF 1.552, M23)

Otašević B, Šljivić J, Protić A, Maljurić N, Malenović A, Zečević M. Comparison of AQbD and grid point search methodology in the development of micellar HPLC method for the analysis of cilazapril and hydrochlorothiazide dosage form stability. Microchemical J 2019; 145: 655-663 (Chemistry, Analitical, IF 3,594, M21)

Mitrović M, Protić A, Malenović A, Otašević B, Zečević M. Analytical Quality by Design development of an ecologically acceptable enantioselective HPLC method for timolol maleate enantiomeric purity testing on ovomucoid chiral stationary phase. J Pharm Biomed Anal 2020; 180: 113034. (Chemistry, Analitical, IF 3,209, M22)

Golubovic Jelena B, Birkemeyer Claudia, Protic Ana D, Otasevic Biljana M, Zecevic Mira L. Structure-response relationship in electrospray ionization-mass spectrometry of sartans by artificial neural networks. Journal of Chromatography A, 2016, vol. 1438, 123.132 (Chemistry, Analitical, IF 3,981, M21)

Golubovic Jelena B, Protic Ana D, Zecevic Mira L, Otasevic Biljana M. Quantitative structure retention relationship modeling in liquid chromatography method for separation of candesartan cilexetil and its degradation products, Chemometics and Intelligent Laboratory Systems, 2015, vol. 140 br. , str. 92-101, (Chemistry, Analitical, IF 2,217, M22)

Jovana Krmar, Milan Vukićević, Ana Kovačević, Ana Protić, Mira Zečević, Biljana Otašević. Performance comparison of nonlinear and linear regression algorithms coupled with different attribute selection methods for quantitative structure-retention relationships modeling in micellar liquid chromatography. Journal of Chromatography A 2020; 1623: 461146. DOI: 10.1016/j.chroma.2020.461146. (journal rankings M21, IF=4.049 for year 2019; field Chemistry, Analytical 14/86)

Jelena Golubović, Ana Protić, Biljana Otašević, Mira Zečević. Quantitative structure-retention relationships applied to development of liquid chromatography gradient-elution method for the separation of sartans. Talanta 2016; 150: 190-197. DOI: 10.1016/j.talanta.2015.12.035. (journal rankings M21, IF=4.162 for year 2016; field Chemistry, Analytical 9/76)

Jelena Golubović, Biljana Otašević, Ana Protić, Aleksandra Stanković, Mira Zečević. Liquid chromatography-tandem mass spectrometry for simultaneous determination of undeclared corticosteroids in cosmetic creams. Rapid communications in mass spectrometry 2015; 29 (24): 2319-2327. DOI: 10.1002/rcm.7403. (journal rankings M22, IF=2.226; field Spectroscopy 17/43)

Jelena Golubović, Ana Protić, Mira Zečević, Biljana Otašević, Marija Mikić. Artificial neural networks modelling in UPLC method optimization of mycophenolate mofetil and its degradation products. Journal of chemometrics 2014; 28(7): 567-574. DOI: 10.1002/cem.2616 (journal rankings M21, IF=1.500; field Mathematics, Interdisciplinary Applications 26/99)

Nevena Maljurić; Jelena Golubović, Matjaž Ravnikar, Dušan Žigon, Borut Štrukelj, Biljana Otašević. Isolation and determination of fomentariol – novel potential antidiabetic drug from fungal material. Journal of analytical methods in chemistry 2018; Volume 2018, Article ID 2434691, 9 pages. DOI 10.1155/2018/2434691. (journal rankings M23, IF=1.589; field Chemistry, Analytical 59/84)

Nevena Maljurić, Biljana Otašević, Anđelija Malenović, Mira Zečević, Ana Protić, Quantitative structure retention relationship modeling as potential tool in chromatographic determination of stability constants and thermodynamic parameters of β-cyclodextrin complexation process, Journal of Chromatography A, 1619 (2020) 460971, doi: 10.1016/j.chroma.2020.460971. Chemistry – Analytical category (14/86), M21, IF4.049

Nevena Maljurić, Biljana Otašević, Jelena Golubović, Jovana Krmar, Mira Zečević, Ana Protić, A new strategy for development of eco-friendly RP-HPLC method using Corona Charged Aerosol Detector and its application for simultaneous analysis of risperidone and its related impurities, Microchemical Journal, 153 (2020) 104394. Chemistry – Analytical category (19/86), M21, IF3.594

Klaus Schilling, Jovana Krmar, Nevena Maljurić, Ruben Pawellek, Ana Protić, Ulrike Holzgrabe, Quantitative Structure – Property Relationship modeling of polar analytes lacking UV chromophores to Charged Aerosol Detector Response, Analytical and Bioanalytical Chemistry, 2019, 411: 2945-2959. Chemistry – Analytical category (18/86) M21, IF3.637

Nevena Maljurić, Jelena Golubivić, Biljana Otašević, Mira Zečević, Ana Protić, Quantitative structure – retention relationship modeling of selected antipsychotics and their impurities in green liquid chromatography using cyclodextrin mobile phases, Analytical and Bioanalytical Chemistry, 2018, 410: 2533–2550. Chemistry – Analytical category (18/84) M21, IF3.286

Ana Protić, Marina Radišić, Jelena Golubović, Biljana Otašević, Mira Zečević, Mila Laušević, Structural elucidation of unknown oxidative degradation products of Mycophenolate mofetil using LC-MSn, Chromatographia, 2016, 79: 919-926 (Short communication). Chemistry – Analytical category (52/76) M23, IF1.402


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. SLAĐANA ŠOBAJIĆ

## B R O M A T O L O G Y

| | |
|---|---|
| Research topic title: | Chemical and nutritional value of foods and impact of nutrients on human health |
| RG members: | Dr. Sladjana Sobajic, Full Professor<br>Dr. Ivan Stankovic, Full Professor<br>Dr. Brizita Djordjevic, Full Professor<br>Dr. Ivana Djuricic, Associate Professor<br>Dr. Bojana Vidovic, Associate Professor<br>Dr. Nevena Ivanovic, Assistant Professor<br>Dr. Vanja Todorovic, Teaching Assistant<br>Mag.farm. Milica Zrnic Ciric, Teaching Associate<br>Dr. Uros Cakar, Scientific Associate<br>Mag.farm. Nevena Dabetic, Research Assistant<br>Mag.farm-med.biohem. Tijana Ilic, Research Trainee |
| Equipment and methods: | 1. GC Agilent Technologies 7890A with a flame ionization detector (FID)<br>2. ELISA reader BIOTEK, USA, ELx800 Absorbance Microplate Reader<br>3. Single-beam spectrophotometer J. P. SELECTA<br>4. UV/VIS LLG-UniSPEC 2 Spectrophotometer |
| Projects/ funding: | CA16112 “Personalized Nutrition in aging society: redox control of major age-related diseases” (2016-2021)<br>CA17117 “Towards an International Network for Evidence-based Research in Clinical Health Research” (2018-2022)<br>CA19105 “Pan-European Network in Lipidomics and EpiLipidomics” (2020-2024) |
| Collabora-tions: | Bilateral project with Department of Nutritional Science, University of Vienne: Evaluation of the potential of a new probiotic concept for the menagment of obesity and its associated comorbidies, 2018-<br>CBIOS, Universidade Lusófona´s Research Center for Biosciences & Health Technologies, Lisbon, Portugal, prof. dr Ana Sofia Fernandes, 2018- |

# RESEARCH GROUP
# PROF. SLAĐANA ŠOBAJIĆ

## Selected publications


Koss-Mikołajczyk I, Todorovic V, Sobajic S, Mahajna J, Gerić M, Tur JA, Bartoszek A. Natural products counteracting cardiotoxicity during cancer chemotherapy: The special case of doxorubicin, a comprehensive review. International Journal of Molecular Sciences. 2021 Jan;22(18):10037.

Djuricic I, Calder PC. Beneficial outcomes of omega-6 and omega-3 polyunsaturated fatty acids on human health: An update for 2021. Nutrients. 2021 Jul;13(7):2421.

Čakar U, Čolović M, Milenković D, Medić B, Krstić D, Petrović A, Đorđević B. Protective effects of fruit wines against hydrogen peroxide-induced oxidative stress in rat synaptosomes. Agronomy. 2021 Jul;11(7):1414.

Dodevska MS, Sobajic SS, Dragicevic VD, Stankovic I, Ivanovic ND, Djordjevic BI. The impact of diet and fibre fractions on plasma adipocytokine levels in prediabetic adults. Nutrients. 2021 Feb;13(2):487.

Ciric MZ, Ostojic M, Baralic I, Kotur-Stevuljevic J, Djordjevic BI, Markovic S, Zivkovic S, Stankovic I. Supplementation with Octacosanol Affects the Level of PCSK9 and Restore Its Physiologic Relation with LDL-C in Patients on Chronic Statin Therapy. Nutrients. 2021 Mar;13(3):903.

Timic JB, Kotur-Stevuljevic J, Boeing H, Krajnovic D, Djordjevic B, Sobajic S. A cross-sectional survey of salty snack consumption among serbian urban-living students and their contribution to salt intake. Nutrients. 2020 Nov;12(11):3290.

Ilić T, Dodevska M, Marčetić M, Božić D, Kodranov I, Vidović B. Chemical characterization, antioxidant and antimicrobial properties of goji berries cultivated in Serbia. Foods. 2020 Nov;9(11):1614.

Dabetic NM, Todorovic VM, Djuricic ID, Antic Stankovic JA, Basic ZN, Vujovic DS, Sobajic SS. Grape seed oil characterization: A novel approach for oil quality assessment. European Journal of Lipid Science and Technology. 2020 Jun;122(6):1900447.

Dabetić N, Todorović V, Panić M, Radojčić Redovniković I, Šobajić S. Impact of deep eutectic solvents on extraction of polyphenols from grape seeds and skin. Applied Sciences. 2020 Jan;10(14):4830.

Dragacevic L, Djordjevic B, Gavrovic-Jankulovic M, Ilic V, Kanazir D, Minic R. ELLSA based profiling of surface glycosylation in microorganisms reveals that ß-glucan rich yeasts' surfaces are selectively recognized with recombinant banana lectin. Glycoconjugate journal. 2020 Feb;37(1):95-105.

Grozdanić N, Đuričić I, Kosanić M, Zdunić G, Šavikin K, Etahiri S, Assobhei O, Benba J, Petović S, Matić IZ, Stanojković TP. Fucus spiralis extract and fractions: Anticancer and pharmacological potentials. Journal of BU ON.. 2020;25(2):1219-29.

Baranowska M, Suliborska K, Todorovic V, Kusznierewicz B, Chrzanowski W, Sobajic S, Bartoszek A. Interactions between bioactive components determine antioxidant, cytotoxic and nutrigenomic activity of cocoa powder extract. Free Radical Biology and Medicine. 2020 Jul 1;154:48-61.

Zrnić-Ćirić M, Dabetić N, Todorović V, Đuriš J, Vidović B. Beta-glucan content and antioxidant activities of mushroom-derived food supplements. Journal of the Serbian Chemical Society. 2020;85(4):439-51.

Milovanovic M, Žeravík J, Obořil M, Pelcová M, Lacina K, Cakar U, Petrovic A, Glatz Z, Skládal P. A novel method for classification of wine based on organic acids. Food chemistry. 2019 Jun 30;284:296-302.

Koss-Mikołajczyk I, Baranowska M, Todorovic V, Albini A, Sansone C, Andreoletti P, Cherkaoui-Malki M, Lizard G, Noonan D, Sobajic S, Bartoszek A. Prophylaxis of non-communicable diseases: why fruits and vegetables may be better chemopreventive agents than dietary supplements based on isolated phytochemicals?. Current pharmaceutical design. 2019 May 1;25(16):1847-60.

Smilkov K, Ackova DG, Cvetkovski A, Ruskovska T, Vidovic B, Atalay M. Piperine: old spice and new nutraceutical?. Current pharmaceutical design. 2019 Apr 1;25(15):1729-39.

Costa JG, Vidovic B, Saraiva N, do Céu Costa M, Del Favero G, Marko D, Oliveira NG, Fernandes AS. Contaminants: a dark side of food supplements?. Free radical research. 2019 Aug 12;53(sup1):1113-35.

Michaličková D, Belović M, Ilić N, Kotur-Stevuljević J, Slanař O, Šobajić S. Comparison of polyphenol-enriched tomato juice and standard tomato juice for cardiovascular benefits in subjects with stage 1 hypertension: A randomized controlled study. Plant Foods for Human Nutrition. 2019 Mar;74(1):122-7.

Milović S, Stanković I, Nikolić D, Radović J, Kolundžić M, Nikolić V, Stanojković T, Petović S, Kundaković-Vasović T. Chemical analysis of selected seaweeds and seagrass from the Adriatic Coast of Montenegro. Chemistry & biodiversity. 2019 Oct;16(10):e1900327.

Čakar U, Grozdanić N, Pejin B, Vasić V, Čakar M, Petrović A, Djordjević B. Impact of vinification procedure on fruit wine inhibitory activity against α-glucosidase. Food Bioscience. 2018 Oct 1;25:1-7.

Michalickova D, Kotur-Stevuljevic J, Miljkovic M, Dikic N, Kostic-Vucicevic M, Andjelkovic M, Koricanac V, Djordjevic B. Effects of probiotic supplementation on selected parameters of blood prooxidant-antioxidant balance in elite athletes: a double-blind randomized placebo-controlled study. Journal of human kinetics. 2018 Sep;64:111.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# ASSOC. PROF. KATARINA NIKOLIĆ

## P H A R M A C E U T I C A L  C H E M I S T R Y

Research topic title: Quantitative Structure-Activity Relationship, synthesis, physicochemical characterization and evaluation of pharmacologically active compounds

RG members:

Dr. Katarina Nikolić, Associate Professor
Dr. Gordana Popovic, Full Professor
Dr. Mara Aleksic, Full Professor
Dr. Slavica Oljacic, Assistant Professor
Dr. Marija Popović Nikolić, Professor
Dr. Teodora Đikić, Research Assistant
Dr. Valentina Radulović, Teaching Assistant
Mr. Pharm. Dušan Ružić, Teaching Assistant
Mr. Pharm. Nemanja Đoković, Teaching Assistant
Mr. Pharm. Milica Radan, Teaching Assistant
Mr. Pharm. Darija Obradović, Teaching Assistant

Equipment and methods: Computers with Linux and Windows operating systems various programs for Drug Discovery - VMD, NAMD, Gromacs, AutoDock, AD Vina, GOLD, Pentacle, FLAP, ADMET predictor, Dragon6, SIMCA, MODDE.
HPLC-UV (Thermo scientific, USA, Dionex Ultimate 3000), UHPLC/MS/MS (ThermoScientific, USA, Accela 6000 TSQ Quantum Access Max), FT-IR (Thermo Scientific, USA, Nicolet iS10), NMR (Bruker, USA, Ascend 400), Automatic titrator 798 MPT Titrino (Metrohm, Switzerland) with a combined electrode LL unitrode Pt 1000 (Metrohm, Switzerland)
Potentiostat / galvanostat, μAutolab analyser EcoChemie, The Nederlands, 663 VA Stand, Metrohm, Switzerland.

**Computational skills**

- Drug Design Software packages: Maestro, FLAP, BIOVIA D.S., Shrodinger Suite
- Biophysical simulations of complex systems – Gromacs program, Python programming
- Virtual docking - with Autodock Vina, GOLD and Glide program
- Protein modelling – Modeller, Chimera, Schrodinger
- in silico ADMET screening: ADMET predictor and ACD/Labs Percepta program
- Ligand-based virtual screening, structure-based virtual screening, pharmacophore-based virtual screening – FLAP/GRID programs
- 3D-QSAR and pharmacophore modelling: Pentacle program (Molecular Discovery), Phase (Shrodinger)
- Artificial Neural Networks and Support Vector Machine modeling - Statistica program
- PLS/PCA modelling - SIMCA P+ version 12.0, 2008, Umetrics AB; MODDE, Umetrics AB.

**Laboratory skills:** high performance liquid chromatography, gas chromatography, UV/VIS spectroscopy, IR-spectroscopy, NMR spectroscopy, LC-MS/MS, in vitro ADMET profiling (PAMPA, biomicelar chromatography, hydrophilic interaction liquid chromatography (HILIC)), *in vitro* testing, organic synthesis, physicochemical characterization. Electrochemical techniques: cyclic voltammetry (CV), differential pulse voltammetry (DPV), and square wave voltammetry (SWV).

# RESEARCH GROUP
# ASSOC. PROF. KATARINA NIKOLIĆ

**Projects/ funding:**

1. Ministry of Sci. Techn. Dev. Serbia, Contract No 451-03-9/2021-14/200161
2. Bilateral project, Hubert Curien Partnership Project for collaboration France-Serbia 2020-2022 (Program Pavle Savic 2020): Identification of novel DOT1L and DNMT1/3A inhibitors, with Epigenetic Chemical Biology, Institut Pasteur, CNRS UMR3523, Paris 75015 France (Prof Paola Arimondo research group).
3. Deutsche Forschungsgemeinschaft (DFG) project named: Control of epigenetic states through light-triggered protein-protein interaction mediators, 2020-2023 PI Asst. Prof. Olalla Vázquez, Fachbereich Chemie Philipps-Universität Marburg, Germany.
4. COST action CA18240 (2019-2023): "Adher ´n Rise' on adhesion GPCRs for non-tenured scientists"
5. COST action CA18133 (2019-2023): "European Research Network on Signal Transduction"

**Collabora-tions:**

1. Center for Multidisciplinary Research Institute of Nuclear Sciences VINCA, Serbia (national project 172033, 173001),
2. Institute of Oncology and Radiology of Serbia (national project 173001), University of East Anglia, UK (COST CM1406),
3. Universite de Poitiers, France (COST CM1406, COST CA17104),
4. University of St Andrews, UK (COST CM1103, COST CA15135),
5. Consejo Superior de Investigaciones Cientıficas, Madrid, Spain (COST CM1103, COST CA15135),
6. Heinrich Heine University, Dusseldorf, Germany (COST CM1103, COST CA1207, COST CA15135, COST CA18133),
7. Institut Pasteur, CNRS, Paris, France (COST CM1406, Bilateral project Serbia-France),
8. Fachbereich Chemie Philipps-Universität Marburg, Germany (COST CM1406, Deutsche Forschungsgemeinschaft project), Fraunhofer IME-SP, Hamburg, Germany (COST CM1406, COST CA15135), University of Eastern Finland, Kuopio, Finland (COST CM1406).

**Selected publications**


Bouchet S, Linot C, Ruzic D, Agbaba D, Fouchaq B, Roche J, Nikolic K, Blanquart C, Bertrand P. Extending Cross Metathesis To Identify Selective HDAC Inhibitors: Synthesis, Biological Activities, and Modeling. ACS Med. Chem. Lett. 2019, 10, 863−868. doi:10.1021/acsmedchemlett.8b00440. (M21)

Ruzic D, Petkovic M, Agbaba D, Ganesan A, Nikolic K. Combined Ligand and Fragment-based Drug Design of Selective Histone Deacetylase-6 Inhibitors. Molecular Informatics 2019 May; 38 (5): e1800083. doi: 10.1002/minf.201800083. (M21)

Albert L, Peñalver A, Djokovic N, Werel L, Hoffarth M, Ruzic D, Xu J, Essen LO, Nikolic K, Dou Y, Vázquez O. Modulating Protein-Protein Interactions with Visible-Light Responsive Peptide Backbone Photoswitches. ChemBioChem 2019 Jun 3; 20(11): 1417-1429. doi: 10.1002/cbic.201800737. (M22)

Djikic T, Vucicevic J, Laurila J, Radi M, Veljkovic N, Xhaard H, Nikolic K. Deciphering Imidazoline Off-Targets by Fishing in the Class A of GPCR field. Molecular Informatics 2020 July, 39 (7): 1900165. doi: 10.1002/minf.201900165. (M21)

S. Abás, S. Rodríguez-Arévalo, A. Bagán, C. Griñán-Ferré, F. Vasilopoulou, I. Brocos-Mosquera, C. Muguruza, B. Pérez, E. Molins, F. Javier Luque, P. Pérez-Lozano, S. de Jonghe, D. Daelemans, L. Naesens, J. Brea, M. Isabel Loza, E. Hernández-Hernández, J. A. García-Sevilla, M. Julia García-Fuster, M. Radan, T. Djikic, K. Nikolic, M. Pallàs, L. F. Callado, C. Escolano. Bicyclic α-Iminophosphonates as High Affinity Imidazoline I2 Receptor Ligands for Alzheimer's Disease. Journal of Medicinal Chemistry 2020 63 (7): 3610-3633, DOI: 10.1021/acs.jmedchem.9b02080 (M21a)

M. Radan, D. Ruzic, M. Antonijevic, T. Djikic, K. Nikolic. In silico Identification of Novel 5-HT2A Antagonists Supported with Ligand- and Target- Based Drug Design Methodologies, Journal of Biomolecular Structure and Dynamics 2020 March: 1819-1837 DOI: 10.1080/07391102.2020.1738961 (M22)

M. Elek, N. Djokovic, A. Frank, S. Oljacic, A. Zivkovic, K. Nikolic, H. Stark. Synthesis, in silico, and in vitro studies of novel dopamine D2 and D3 receptor ligands, Arch Pharm. 2021; 354: e2000486. DOI: 10.1002/ardp.202000486. (M22)

N. Djokovic, D. Ruzic, T. Djikic, S. Cvijic, J. Ignjatovic, S. Ibric, K. Baralic, A. Buha Djordjevic, M. Curcic, D. Djukic-Cosic, K. Nikolic. An Integrative in Silico Drug Repurposing Approach for Identification of Potential Inhibitors of SARS-CoV-2 Main Protease. Mol. Inf. 2021, 40, 2000187. DOI: 10.1002/minf.202000187 (M21)

I. Asanovic, E. Strandback, A. Kroupova, Dj. Pasajlic, A. Meinhart, P. Tsung-Pin, N. Djokovic, D. Anrather, T. Schuetz, M.J. Suskiewicz, S. Sillamaa, T. Kocher, R. Beveridge, K. Nikolic, A. Schleiffer, M. Jinek, M. Hartl, T. Clausen, J.Penninger, P. Macheroux, S. Weitzer, J. Martinez. The oxidoreductase PYROXD1 uses NAD(P)+ as an antioxidant to sustain tRNA ligase activity in pre-tRNA splicing and unfolded protein response. Molecular Cell 81 (12), P2520-2532.E16, June 17, 2021. DOI: https://doi.org/10.1016/j.molcel.2021.04.007 (M21a)

S. Rodriguez-Arévalo, A. Bagán, Christian G. Ferré, F. Vasilopoulou, M. Pallàs, I. Brocos-Mosquera, L.F. Callado, M. Isabel Loza, A.L. Martínez, J. Brea, B. Pérez, E. Molins, S. De Jonghe, D. Daelemans, M. Radan, T. Djikic, K. Nikolic, E.H. Hernández, M.J. García-Fuster, J.A. García-Sevilla, C. Escolano, Benzofuranyl-2-imidazoles as imidazoline I2 receptor ligands for Alzheimer's disease, European Journal of Medicinal Chemistry 2021, 222, 113540, https://doi.org/10.1016/j.ejmech.2021.113540. (M21a)

D. Ruzic, N. Djokovic, and K. Nikolic (2021) Fragment-Based Drug Design of Selective HDAC6 Inhibitors. In: Ballante F. (Editor(s)) Protein-Ligand Interactions and Drug Design. Methods in Molecular Biology, vol 2266. Humana, New York, NY. https://doi.org/10.1007/978-1-0716-1209-5_9

T. Djikic, Z. Gagic, K. Nikolic, Chapter 16 - Design and Discovery of Kinase Inhibitors Using Docking Studies, Editor(s): Mohane S. Coumar, Molecular Docking for Computer-Aided Drug Design, Academic Press, 2021, Pages 337-365, ISBN 9780128223123, https://doi.org/10.1016/B978-0-12-822312-3.00009-6.J. Rupar, M. Aleksić, K. Nikolić, M. Popović Nikolić. Comparative electrochemical studies of kinetic and thermodynamic parameters of Quinoxaline and Brimonidine redox process, Electrochimica acta. 2018; May 278: 220-231. (M21, IF 5,116) https://doi.org/10.1016/j.electacta.2018.03.114

V. Radulović, M. Aleksić, V. Kapetanović, K. Karljiković Rajić, M. Jovanović, I. Marjanović, M. Stojković, D. Agbaba. The evaluation of short- and long-term stability studies for brimonidine in aqueous humor by DPV/BDDE method - possible application for direct assay in native samples. Anal Bioanal Chem. 2019; Sept 411(22):5755–63. (M21; IF 3,286) https://doi.org/10.1007/s00216-019-01955-3

J. Rupar, M. Aleksić, V. Dobričić, J. Brborić, O. Čudina. An electrochemical study of 9-chloroacridine redox behavior and its interaction with double-stranded DNA, Bioelectrochemistry, 2020 October; 135: 107579 (M21, IF 4,722) https://doi.org/10.1016/j.bioelechem.2020.107579


*Full bibliography:*
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# RESEARCH GROUP
# PROF. SLAVICA ERIĆ

## P H A R M A C E U T I C A L  C H E M I S T R Y

| | |
|---|---|
| Research topic title: | Design of new drugs from natural sources |
| RG members: | Dr. Slavica Erić, Full Professor<br>Dr. Mire Zloh<br>Mr. Aleksandar Vukadinović<br>Dr. Zoran Bijelović |
| Equipment and methods: | Computer operating systems for drug design, computer programs for elucidation of mechanisms of action of natural sources constituents and drug design from natural sources, use of equipement for extraction and identification of natural sources constituents, use of equipement for testing activity of natural sources constituents on various targets. |
| Projects/ funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161 |
| Collaborations: | Departments of Botany, Analytical Chemistry and Pharmacokinetics, Faculty of Pharmacy at University of Belgrade (UB),<br>Institute of molecular genetics and genetic engineering (UB),<br>Institute of Chemistry, Technology and Metalurgy (UB),<br>Institute for nuclear sciences “Vinča”, Faculty of Medicine (UB). |
| Selected publications | 3D-QSAR study of adenosine 5'-phosphosulfate (APS) analogs as ligands for APS reductase. Slavica Erić, Ilija Cvijetić and Mire Zloh. J. Serb. Chem. Soc. 86 (0) 1–10 (2021)<br>Insights into mechanism of anticancer activity of pentacyclic oxindole alkaloids of *Uncaria tomentosa* by means of a computational reverse virtual screening and molecular docking approach. Kozielewicz Pawel, Paradowska Katarzyna, Eric Slavica, Wawer Iwona, Zloh Mire. Monatshefte fur Chemie (2014), 145 (7), 1201-1211<br>Structural insight into binding of small molecule inhibitors to Enhancer of Zeste Homolog 2. Kalinic Marko, Zloh Mire, Eric Slavica. Journal of Computer-Aided Molecular Design (2014), 28 (11), 1109-1128<br>Computational classification models for predicting the interaction of drugs with P-glycoprotein and breast cancer resistance protein. Eric Slavica, Kalinic Marko, Ilic Katarina, Zloh Mire. SAR and QSAR in Environmental Research (2014), 25 (12), 955-982<br>Application of Counter-propagation Artificial Neural Networks in Prediction of Topiramate Concentration in Patients with Epilepsy. Jovanovic Marija, Sokic Dragoslav, Grabnar Iztok, Vovk Tomaz, Prostran Milica, Eric Slavica, Kuzmanovski Igor, Vucicevic Katarina, Miljkovic Branislava. Journal of Pharmacy and Pharmaceutical Sciences (2015), 18 (5), 856-862 |

*Full bibliography:*
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# RESEARCH GROUP
# ASST. PROF. VLADIMIR DOBRIČIĆ

## P H A R M A C E U T I C A L  C H E M I S T R Y

| | |
|---|---|
| Research topics titles: | 1. Design, synthesis, investigation of physico-chemical and biopharmaceutical properties of pharmacologically active compounds<br>2. Development and validation of analytical methods for the quantification of pharmaceutical substances in dosage forms and biological samples |
| RG members: | Dr. Vladimir Dobričić, Assistant Professor<br>Dr. Zorica Vujić, Full Professor<br>Dr. Olivera Čudina, Full Professor<br>Dr. Katarina Karljiković Rajić, Full Professor<br>Dr. Jasmina Brborić, Associate Professor<br>Dr. Bojan Marković, Associate Professor<br>Dr. Branka Ivković, Associate Professor<br>Dr. Milkica Crevar Sakač, Assistant Professor<br>Dr. Jelena Savić, Assistant Professor<br>Mr. Pharm. Jelena Rupar, Teaching Assistant<br>Mr. Pharm. Jelena Bošković, Research Assistant |
| Equipment and methods: | **1. Computers with Windows operating systems and various drug design software installed**- VMD, NAMD, AutoDock, AutoDock Vina, OpenEye software package, Statistica<br>**2. HPLC-PDA-CAD** (Dionex Ultimate 3000);<br>**3. HPLC-PDA** (Agilent 1200);<br>**4. HPLC-UV** (HP 1100);<br>**5. UHPLC-MS/MS** (Accela 6000 TSQ Quantum Access Max),<br>**6. FT-IR spectrophotometer** (Nicolet iS10);<br>**7. UV-Vis spectrophotometer** (Evolution 300);<br>**8. UV-Vis spectrophotometer** (GBC Scientific Equipment Cintra 20);<br>**9. Automatic titrator 798 MPT Titrino** with electrode LL unitrode Pt 1000.<br>**10. Vacuum drying oven** (Thermo Heraeus) |
| Projects/funding: | **1. Institutional financing by the Ministry of Education, Science and Technological Development** Contract No. 451-03-9/2021-14/200161;<br>**2. Proof of concept** (PoC – Republic of Serbia Innovation fund: "Development of new antiseptic/disinfectant based on antimicrobial effect of newly synthesized chalcones");<br>**3. Program for Excellent Projects of Young Researchers – PROMIS; Science fund of the Republic of Serbia** („Utility of plasma drug level monitoring and CYP2C19/CYP2D6 genotyping in dose personalization of antidepressants and antipsychotics");<br>**4. COST action CA17104 (2018-2022):** "New diagnostic and therapeutic tools against multidrug resistant tumours". |

# RESEARCH GROUP
# ASST. PROF. VLADIMIR DOBRIČIĆ

Collaborations:

1. University of Belgrade – Faculty of Pharmacy (research groups of prof. dr. Miroslav Savić, prof. dr. Snežana Savić, prof. dr. Svetlana Ibrić, prof. dr. Vesna Spasojević Kalimanovska, prof. dr Marina Milenković);
2. Institute for oncology and radiology of Serbia;
3. National Poison Control Centre, Department of Experimental Toxicology and Pharmacology, Military Medical Academy;
4. Institute of molecular genetics and genetic engineering, University of Belgrade;
5. Faculty of medical sciences, University of Kragujevac;
6. The Chair of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Ljubljana, Slovenia

Selected publications


Dallavalle, S., **Dobričić, V**., Lazzarato, L., Gazzano, E., Machuqueiro, M., Pajeva, I., Tsakovska, I., Zidar, N., & Fruttero, R. (2020). Improvement of conventional anti-cancer drugs as new tools against multidrug resistant tumors. Drug Resistance Updates, 50, 100682.

Hendrickx, L. A., **Dobričić, V**., Toplak, Ž., Peigneur, S., Mašič, L. P., Tomašič, T., & Tytgat, J. (2020). Design and characterization of a novel structural class of Kv1. 3 inhibitors. Bioorganic chemistry, 98, 103746.

**Rupar, J**., **Dobričić, V**., Grahovac, J., Radulović, S., Skok, Ž., Ilaš, J., Aleksić, M., **Brborić, J.**, & **Čudina, O**. (2020). Synthesis and evaluation of anticancer activity of new 9-acridinyl amino acid derivatives. RSC medicinal chemistry, 11(3), 378-386.

Turkovic, N., **Ivkovic, B**., Kotur-Stevuljevic, J., Tasic, M., **Marković, B**., & **Vujic, Z.** (2020). Molecular docking, synthesis and anti-HIV-1 protease activity of novel chalcones. Current pharmaceutical design, 26(8), 802-814.

Krkobabić, M., Medarević, D., Pešić, N., Vasiljević, D**., Ivković, B.**, & Ibrić, S. (2020). Digital light processing (DLP) 3D printing of atomoxetine hydrochloride tablets using photoreactive suspensions. Pharmaceutics, 12(9), 833.

Homšek, A., **Marković, B**., Bogavac-Stanojević, N., Vladimirov, S., & **Karljiković-Rajić, K.** (2020). Method Transfer Evaluation for Digital Derivative Spectrophotometry Through its Resolution Parameter Comparison of Different Computer Programs. Applied spectroscopy, 74(5), 525-535.

Janković, T., Turković, N., Kotur-Stevuljević, J., **Vujić, Z**., & **Ivković, B**. (2020). Differences in antioxidant potential of chalcones in human serum: In vitro study. Chemico-biological interactions, 324, 109084.

Knutson, D. E., Kodali, R., Divović, B., Treven, M., Stephen, M. R., Zahn, N. M., **Dobričić, V.,** Huber, A. T., Meirelles, M. A., Verma, R. S., Wimmer, L., Witzigmann, C., Arnold, L. A., Chiou, L-C., Ernst, M., Mihovilovic, M. D., Savić, M. M., Sieghart, W., & Cook, J. M. (2018). Design and synthesis of novel deuterated ligands functionally selective for the γ-aminobutyric acid type A receptor (GABAAR) α6 subtype with improved metabolic stability and enhanced bioavailability. Journal of medicinal chemistry, 61(6), 2422-2446.

**Dobričić, V**., **Savić, J**., Nikolic, K., Vladimirov, S., **Vujić, Z**., & **Brborić, J.** (2017). Application of biopartitioning micellar chromatography and QSRR modeling for prediction of gastrointestinal absorption and design of novel β-hydroxy-β-arylalkanoic acids. European Journal of Pharmaceutical Sciences, 100, 280-284.

**Dobričić, V**., **Marković, B**., Nikolic, K., Savić, V., Vladimirov, S., & **Čudina, O**. (2014). 17β-carboxamide steroids–in vitro prediction of human skin permeability and retention using PAMPA technique. European Journal of Pharmaceutical Sciences, 52, 95-108.

**Ivković, B. M**., Nikolic, K., Ilić, B. B., Žižak, Ž. S., Novaković, R. B., **Čudina, O. A**., & Vladimirov, S. M. (2013). Phenylpropiophenone derivatives as potential anticancer agents: Synthesis, biological evaluation and quantitative structure–activity relationship study. European journal of medicinal chemistry, 63, 239-255.

**Crevar-Sakač, M**., **Vujić, Z**., **Brborić, J.,** Kuntić, V., & Uskoković-Marković, S. (2013). An improved HPLC method with the aid of a chemometric protocol: Simultaneous determination of atorvastatin and its metabolites in plasma. Molecules, 18(3), 2469-2482.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. SNEŽANA SAVIĆ

## PHARMACEUTICAL TECHNOLOGY AND COSMETOLOGY

Research topics titles:

**Nano-platforms for brain/skin drug delivery (NANO-BRAIN/SKIN)**
Dermal drugs availability - in vitro/in vivo correlations
Microfluidic techniques in preclinical development of micro- and nanocarriers
Nanomaterials for cosmetic application and in vivo biophysical methods for efficacy evaluation

RG members:

**Permanent team members:**
**Dr. Snežana Savić, Full Professor**
Dr. Ivana Pantelić, Assistant Professor
Dr. Tanja Ilić, Teaching Assistant
Mr. Pharm. Ines Nikolić, Teaching Assistant
Jelena Đoković
Jelena Mitrović
Ana Gledović

**Coworkers through the institutional funding:**
Dr. Danina Krajišnik, Associate Professor
Dr. Bojan Čalija, Associate Professor
Dr. Milica Lukić, Assistant Professor
Mr. Pharm. Nevena Pajić

**External members/PhD students:**
Olivera Drulović (sholarship by MESTD RS)
Milica Todorović
Milica Aranđelović
Miroslav Jevtić
Mirjana Timotijević

Equipment:

High pressure homogeniser (HPH)
SPG membrane microfluidiser
Disruptor Genie (Scientific Industries, SAD) for nanocrystals manufacturing
Zetasizer ZS90 (Malvern Instruments Ltd., Worcestershire, UK)
Olympus BX53-P polarisation microscope (Olympus, Japan)
Rheometer, Paar Physica, Nemačka
DSC 1 (Mettler-Toledo AG, Analytical, Švajcarska)
Franzs diffusion cells and set for in vitro release and skin permeation studies
Courage + Khazaka devices for biophysical skin parameters measurements (pH, skin hydration, TEWL, sebum lipids content, frictiometer probe, melanin index, erithem index, skin viscoelasticity)
Texture analyser EZ-LX-HS, Shimadzu, Japan
Small equipment for samples preparation

Methods:

Nanoparticulated carriers manufacturing applying different techniques with/without energy input (energy-saving procedures) using QbD approach
In vitro release, skin penetration/permeation studies from different carriers/vehicles for skin application
Tape-stripping and differential tape-stripping, in vivo skin blanching assay for bioequivalence of topical dermatological drug products
In vitro technique with dyalisis bags for parenteral pharmaceutical forms
Biophysical and sensorial measurements of skin parameters accompanied with organization of in vivo studies and statistical analysis
Physicochemical characterization of colloidal drug/cosmetic actives carriers (particle size, polydispersity index, rheological and texture analysis, optical/polarization microscopy, thermal behavior)
In vivo pharmacodynamic and pharmacokinetic studies on animal models

# RESEARCH GROUP
# PROF. SNEŽANA SAVIĆ

Projects/ funding:

**Proof of Concept (PoC)** – Innovation Fund of Republic of Serbia: "*Natural cosmetic nano-serum with Red Raspberry Seed Oil of Serbian origin for antioxidant treatment of skin photoaging*", 2.400.000 RSD.
Institutional funding through Contract of MESTD RS, Grant No. 451-03-9/2021-14/200161.
Bilateral project with Eberhard-Karls Universität Tübingen (2020-2021: *Innovative nanoformulations for brain/skin delivery of patented vs. reference active substances: novel formulation approaches and tailored in vitro/in vivo methods for delivery assessment*).
Advanced In Chemico/In Vitro Training and Capacity Building for Safe Cosmetic Nanomaterials and Nanostructured Products (NanoCosMetrics), Training and Capacity Building Project, organized by Joint Research Center of European Commission (Ispra, Italy).
Coworkers at H2020-IMI projects: IMI2-2017-13-10 -*Improving the preclinical prediction of adverse effects of pharmaceuticals on the nervous system* (NeuroDeRisk, Grant agreement ID: 821528).

Collabora-tions:

**University of Belgrade – Faculty of Pharmacy**
Group of prof. Miroslav Savić (Department of Pharmacology)
Group of prof. Jelena Antić Stanković (Department of Microbiology and Immunology)
Department of Pharmaceutical chemistry (UPLC and HPLC aparatus/methods)
Department of Physical chemistry and instrumental methods
**University of Belgrade – Mining and geological faculty** Group of prof. Aleksandar Kremenovic
**University of Belgrade – Institute of chemistry, technology and metallurgy** Dr sc. Danijela Ranđelović
**University of Novi Sad**
Faculty of Technical sciences – Prof. Goran Stojanović
School of Medicine/Department of Pharmacy – Prof. Veljko Krstonošić
**University of Nis**
School of Medicine/Department of Pharmacy – Prof. Ivana Nešić, Assist. prof. Marija Tasić Kostov
Faculty of Technology Leskovac – Prof. Nebojša Cekić
**Institute for natural medicines research "Josif Pančić"**

**International collaborations**
Institut of Pharmaceutical technology, Eberhard-Karls Universität Tübingen, Germany
Institut of Pharmaceutical technology, University of Braunschweig, Germany
National Helenic Research Fondation, Athenes, Greece
Department of Pharmaceutical technology, Faculty of Pharmacy, University of Ljubljana
Institute of Pharmaceutical technology, Medical University Gdansk, Poland
Universite Le Havre, France
London College of Fashion, Unoversity of Arts, London, UK
School of Pharmacy, University College Cork, Cork, Ireland, dr sc. Sonja Vučen
Loughborough University, Department of Chemical Engineering, Prof. Goran Vladisavljević

Selected publications


**Gledovic A**, Janosevic Lezaic A, **Nikolic I**, Tasic-Kostov M, Antic-Stankovic J, Krstonosic V, Randjelovic D, Bozic D, Ilic D, Tamburic S, **Savic S. Polyglycerol Ester-Based Low Energy Nanoemulsions with Red Raspberry Seed Oil and Fruit Extracts: Formulation Development toward Effective In Vitro/In Vivo Bioperformance**. Nanomaterials (Basel). 2021 Jan 15;11(1):217. doi: 10.3390/nano11010217 (**IF 4,324/2019**)

**Mitrović JR**, Divović B, Knutson DE**, Đoković JB**, Vulić PJ, Randjelović DV, Dobričić VD, Čalija BR, Cook JM, Savić MM, **Savić SD. Nanocrystal dispersion of DK-I-56-1, a poorly soluble pyrazoloquinolinone positive modulator of α6 GABAA receptors: Formulation approach toward improved in vivo performance.** Eur J Pharm Sci. 2020, doi: 10.1016/j.ejps.2020.105432 **(IF 3,616/2019)**.

**Nikolić I**, Mitsou E, Damjanović A, Papadimitriou V, Antić-Stanković J, Stanojević B, Xenakis A, **Savic S. Curcumin-loaded low-energy nanoemulsions: Linking EPR spectroscopy-analysed microstructure and antioxidant potential with in vitro evaluated biological activity.** J Mol Liq. 2020, doi.org/10.1016/j.molliq.2020.112479 **(IF 5,065/2019)**.

Savić V, **Ilić T, Nikolić I**, Marković B, **Čalija B**, Cekić N, **Savić S. Tacrolimus-loaded lecithin-based nanostructured lipid carrier and nanoemulsion with propylene glycol monocaprylate as a liquid lipid: Formulation characterization and assessment of dermal delivery compared to referent ointment**. Int J Pharm. 2019, doi: 10.1016/j.ijpharm.2019.118624 **(IF 4,845/2019)**.

**Ilić T**, Savić S, Batinić B, Marković B, Schmidberger M, Lunter D, Savić M, **Savić S. Combined use of biocompatible nanoemulsions and solid microneedles to improve transport of a model NSAID across the skin: In vitro and in vivo studies.** Eur J Pharm Sci. 2018, doi: 10.1016/j.ejps.2018.09.023. **(IF 3,616/2019)**.

Đorđević SM, Santrač A, Cekić ND, Marković BD, Divović B, **Ilić TM**, Savić MM, **Savić SD. Parenteral nanoemulsions of risperidone for enhanced brain delivery in acute psychosis: Physicochemical and in vivo performances.** Int J Pharm. 2017 doi: 10.1016/j.ijpharm.2017.05.051. **(IF 4,213/2018)**.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. SVETLANA IBRIĆ

## PHARMACEUTICAL TECHNOLOGY AND COSMETOLOGY

**Research topics titles:**

Formulation approaches for improving solubility and bioavailability of poorly soluble drugs
Application of 3D and 2D printing techniques in the dosage form development
Application of optimization techniques, multivariate analysis and machine learning in the development of formulation and processes
Application of physiologically-based modeling in biopharmaceutical characterization and bioperformance assessment of drug substances/pharmaceutical products
Development of advanced therapeutic systems based on micro- and nanoencapsulation of drugs for different routes of administration
Preformulation and formulation studies of drugs and excipients in the development of solid dosage forms for different routes of administration

**RG members:**

Dr. Svetlana Ibrić, Full Professor
Dr. Jelena Parojčić, Full Professor
Dr. Dragana Vasiljević, Associate Professor
Dr. Sandra Cvijić, Associate Professor
Dr. Ljiljana Đekić, Associate Professor
Dr. Jelena Đuriš, Associate Professor
Dr. Đorđe Medarević, Senior Research Associate
Dr. Ivana Aleksić, Assistant Professor
Dr. Milica Drašković, Teaching Assistant
Mr. Pharm. Marijana Madžarević, Research Assistant
Mr. Pharm. Ivana Vasiljević, Research Assistant
Mr. Pharm. Jelisaveta Ignjatović, Research Assistant
Mr. Pharm. Ivana Kurćubić, Research Assistant
Mr. Pharm. Ana Ćirić, Research Trainee
Mr. Pharm. Erna Turković, Research Trainee
Mr. Pharm. Nikola Pešić, Research Trainee

**Equipment and methods:**

OYSTAR Hüttlin Mycrolab fluid-bed device
Gamlen D-series dynamic powder compaction analyser
Sintratec SLS 3D printer
Ultimaker 2 3D printer
Wanhao Duplicator 8 3D printer
Korsch EK0 single punch tablet press
Erweka DT 600 and DT 126 light paddle and basket dissolution apparatus
Sotax CE7 flow through cell dissolution apparatus
Bio Dis VK 750 D reciprocating cylinder dissolution apparatus
Erweka ZT 52 disintegration tester
Paar Physica RHEOLAB MC-120 rotational rheometer
Olympus BX53-P polarizing microscope
DSC 1 differential scanning calorimeter
Erweka TBH 125 tablet hardness tester
Shimadzu EZ-LX texture analyser

Software licences
GastroPlus™ software (v. 9.8.0002, Simulations Plus Inc., Lancaster, CA, USA)

**Projects/ funding:**

Institutional financing through the Contract no. 451-03-9 / 2021-14 /200161 with Ministry of education, science and technological development, Republic of Serbia
FDA-supported project: “Robust In Vitro / In Silico Model to Accelerate Generic Drug Product Development for the Oral Cavity Route of Administration” (2020-2023)
Project of Scientific and Technological Cooperation between the Republic of Serbia and the People's Republic of China: "Development of inhaled nano-drugs for targeted therapy of lung diseases using an innovative experimental-computer approach" (2021-2022)
CEEPUS project: “Central European Knowledge Alliance for Teaching, Learning & Research in Pharmaceutical Technology” CIII-RS-1113-00-1718 (od 2017)
COST action: “European Network on Understanding Gastrointestinal Absorption-related Processes (UNGAP)” No. CA16205 (2017-2021)
COST action: “European Network of Bioadhesion Expertise: Fundamental Knowledge to Inspire Advanced Bonding” No. CA15216 (2016-2020)
COST action: “Simulation and Pharmaceutical Technologies for Advanced Patient-tailored Inhaled Medicines (SimInhale)” No. MP1404 (2016-2019)
Project of bilateral scientific-technological cooperation between the Republic of Serbia and the Federal Republic of Germany: "Application of machine learning in the development of design space in the development of solid dosage forms" (2013-2014)
Project: "Development of products and technologies that provide the desired release of drugs from solid dosage forms", funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia (2011-2019)
Project: "Development of new encapsulation and enzyme technologies for the production of biocatalysts and biologically active components of food in order to increase its competitiveness, quality and safety", funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia (2011-2019)

# RESEARCH GROUP
# PROF. SVETLANA IBRIĆ

Collaborations:

Department of Pharmaceutical Technology, Faculty of Pharmacy, Aristotle University of Thessaloniki, Greece
Department of Pharmaceutical Technology, Institute of Pharmaceutical Sciences, University of Graz, Austria
Institute of Pharmaceutics and Biopharmaceutics, Faculty of Pharmacy, Heinrich Heine, University of Dusseldorf, Germany
Department of Biopharmacy and Pharmaceutical Technology, Johannes Gutenberg Institute of Pharmacy and Biochemistry, University of Mainz, Germany
Department of Pharmaceutical Technology, Faculty of Pharmacy in Granada, Spain
Department of Pharmaceutical Technology, Faculty of Pharmacy, University of Ljubljana, Slovenia
Faculty of Pharmacy and Pharmaceutical Sciences, Trinity College, University of Dublin, Ireland
Department of Pharmaceutical Technology, Faculty of Pharmacy in Sarajevo, Bosnia and Herzegovina
Wuya College of Innovation, Shenyang University of Pharmacy, PR China
Department of Pharmacy, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark
Department of Medicine and Food, University of Parma, Italy
Department of Clinical Pharmacology, School of Pharmacy, Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel

Selected publications


Djuris J, Cirin-Varadjan S, Aleksic I, Djuris M, Cvijic S, Ibric S. Application of Machine-Learning Algorithms for Better Understanding of Tableting Properties of Lactose Co-Processed with Lipid Excipients. Pharmaceutics. 2021; 13(5):663. https://doi.org/10.3390/pharmaceutics13050663

Madžarević M, Ibrić S. Evaluation of exposure time and visible light irradiation in LCD 3D printing of ibuprofen extended release tablets. Eur J Pharm Sci. 2021; 158:105688.

Vasiljević I, Turković E, Piller M, Zimmer A, Parojčić J. An investigation into applicability of different compression behaviour assessment approaches for multiparticulate units characterization. Powder Technol. 2021;379:526-36.

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Medarević D, Ibrić S, Vardaka E, Mitrić M, Nikolakakis I, Kachrimanis K. Insight into the Formation of Glimepiride Nanocrystals by Wet Media Milling. Pharmaceutics. 2020; 12(1). pii: E53. doi: 10.3390/pharmaceutics12010053.

Ćirić A, Medarević Đ, Čalija B, Dobričić V, Mitrić M, Djekic L. Study of chitosan/xanthan gum polyelectrolyte complexes formation, solid state and influence on ibuprofen release kinetics. Int J Biol Macromol. 2020; 148:942-955.

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Markovic M, Zur M, Ragatsky I, Cvijić S, Dahan A. BCS Class IV Oral Drugs and Absorption Windows: Regional-Dependent Intestinal Permeability of Furosemide. Pharmaceutics 2020, 12, 1175; doi:10.3390/pharmaceutics12121175.

Kurcubic I, Cvijic S, Filipcev B, Ignjatovic J, Ibric S, Djuris J. Development of propranolol hydrochloride bilayer mucoadhesive buccal tablets supported by in silico physiologically-based modeling. React Funct Polym. 2020;151

Djuris J, Milovanovic S, Medarevic D, Dobricic V, Dapčević A, Ibric S. Selection of the suitable polymer for supercritical fluid assisted preparation of carvedilol solid dispersions. Int J Pharm. 2019; 554:190-200.

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Krstić M, Medarević Đ, Đuriš J, Ibrić S. Self-nanoemulsifying drug delivery systems (SNEDDS) and self-microemulsifying drug delivery systems (SMEDDS) as lipid nanocarriers for improving dissolution rate and bioavailability of poorly soluble drugs. In Grumezescu AM, editor. Lipid Nanocarriers for Drug Targeting, Elsevier, 2018; 473-508. ISBN: 978-0-12-813687-4

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Vasiljević I,Turković E, Nenadović S, Mirković M, Zimmer A, Parojčić J, Aleksić I. Investigation into liquisolid system processability based on the SeDeM Expert System approach. Int. J. Pharm. 2021; 605, 120847

Turković E, Vasiljević I, Drašković M, Obradović N, Vasiljević D, Parojčić J. An Investigation into Mechanical Properties and Printability of Potential Substrates for Inkjet Printing of Orodispersible Films. Pharmaceutics. 2021; 13(4):468.

Aleksić, I., German Ilić, I., Cvijić, S. et al. An Investigation into the Influence of Process Parameters and Formulation Variables on Compaction Properties of Liquisolid Systems. AAPS PharmSciTech 2020. 21, 242.

Drašković M, Djuriš J, Ibrić S, Parojčić J. Functionality and performance evaluation of directly compressible co-processed excipients based on dynamic compaction analysis and percolation theory. Powder Technol. 2019. 326, 292-301.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. NADA KOVAČEVIĆ

## P H A R M A C O G N O S Y

**Research topic title:** Investigation of natural medicinal products

**RG members:**

Dr. Nada Kovačević, Full Professor
Dr. Branislava Lakušić, Full Professor *
Dr. Silvana Petrović, Full Professor
Dr. Marina Milenković, Full Professor **
Dr. Zoran Maksimović, Full Professor
Dr. Tatjana Kundaković, Full Professor
Dr. Violeta Slavkovska, Associate Professor *
Dr. Milica Drobac, Associate Professor
Dr. Mirjana Marčetić, Assistant Professor
Dr. Danilo Stojanović, Assistant Professor *
Dr. Jelena Kukić-Marković, Teaching Assistant
Dr. Jelena Arsenijević, Research Associate
Dr. Stevan Samardžić, Research Associate
Dr. Ljuboš Ušjak, Research Associate
Dr. Violeta Milutinović, Research Assistant
MSc. Biol. Miloš Zbiljić, Teaching Assistant *
Mr. Pharm. Jelena Radović, Research Trainee
Mr. Pharm. Aleksandra Leković, Research Trainee

* Department of Botany
** Department of Microbiology and Immunology
University of Belgrade - Faculty of Pharmacy

**Equipment and methods:**

Gas chromatograph with flame-ionization detector and mass detector Agilent GC/MSD System 6890N / 5975C
Liquid chromatograph Agilent 1100 HPLC System
Liquid chromatograph with mass detector (LC/MS) Agilent 1260/6130 LC Systems
UV-Vis spectrophotometer Thermo Scientific Evolution 300
Lyophilizer, rotavapors
$CO_2$ incubator MMM Medcenter Einrichtungen GmbH

Optimization of plant material extraction
Qualitative and quantitative analysis of extracts and essential oils
Isolation of plant secondary metabolites
Investigation of antioxidant activity of plant isolates
*In vitro* and *in silico* testing of the ability to inhibit various enzymes by plant isolates
Investigation of antimicrobial activity of plant isolates
*In vivo* study of gastroprotective, hepatoprotective and antidiabetic activity of plant isolates

**Projects/ funding:** Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161.

**Collabora-tions:**

Institute for Biological Research „Siniša Stanković“;
Institute for Oncology and Radiology of Serbia;
Museum of Natural History;
Institute for Medicinal Plant Research „Dr Josif Pančić“, Belgrade;
Department of Pharmacognosy and Natural product Chemistry, School of Pharmacy, University of Athens, Greece;
Department of Medicinal Chemistry and Pharmacognosy, College of Pharmacy, University of Illinois, Chicago, USA;
Equipe de Chimie Analytique des Molécules BioActives Institut Pluridisciplinaire Hubert CURIEN (French National Centre for Scientific Research), Université de Strasbourg.

# RESEARCH GROUP
# PROF. NADA KOVAČEVIĆ

## Selected publications


Marčetić M, Kovačević N, Lakušić D, Lakušić B. Habitat-related variation in composition of the essential oil of *Seseli rigidum* Waldst. & Kit. (Apiaceae). ***Phytochemistry*** 2017; 135: 80-592. doi:10.1016/j.phytochem.2016.12.004

Omar E, Pavlović I, Drobac M, Branković S, Stojanović M, Kovačević N. Chemical composition and spasmolytic activity of *Cymbopogon nervatus* (Hochst.) Chiov. (Poaceae) essential oil. ***Industrial Crops and Products*** 2017; 91: 249-254. doi: 10.1016/j.indcrop.2016.07.013

Suručić R, Kundaković T, Drakul D, Lakušić B, Milovanović S, Kovačević N. Variations in chemical composition, vasorelaxant and angiotensin I-converting enzyme inhibitory activities of essential oil from aerial parts of *Seseli pallasii* Besser (Apiaceae). ***Chemistry & Biodiversity*** 2017; 14(5): e1600407. doi: 10.1002/cbdv.201600407

Milutinović V, Niketić M, Krunić A, Nikolić D, Petković M, Ušjak Lj, Petrović S. Sesquiterpene lactones from the methanol extracts of twenty-eight *Hieracium* species from the Balkan Peninsula and their chemosystematic significance. ***Phytochemistry*** 2018; 154: 19-30. doi: 10.1016/j.phytochem.2018.06.008

Petrović S, Ušjak Lj, Milenković M, Arsenijević J, Drobac M, Drndarević A, Niketić M. *Thymus dacicus* as a new source of antioxidant and antimicrobial metabolites. ***Journal of Functional Foods*** 2017; 28: 114-121. doi: 10.1016/j.jff.2016.11.007

Petrović S, Drobac M, Ušjak Lj, Filipović V, Milenković M, Niketić M. Volatiles of roots of wild-growing and cultivated *Armoracia macrocarpa* and their antimicrobial activity, in comparison to horseradish, *A. rusticana*. ***Industrial Crops and Products*** 2017; 109: 398-403. doi: 10.1016/j.indcrop.2017.08.056

Samardžić S, Arsenijević J, Božić D, Milenković M, Tešević V, Maksimović Z. Antioxidant, anti-inflammatory and gastroprotective activity of *Filipendula ulmaria* (L.) Maxim. and *Filipendula vulgaris* Moench. ***Journal of Ethnopharmacology*** 2018; 213: 132-137. doi: 10.1016/j.jep.2017.11.013

Popović V, Heyerick A, Petrovic S, Van Calenbergh S, Karalic I, Niketic M, Deforce D. Sesquiterpene lactones from the extracts of two Balkan endemic *Laserpitium* species and their cytotoxic activity. ***Phytochemistry*** 2013; 87: 102-111. doi: 10.1016/j.phytochem.2012.11.011

Škobić S, Marčetić MD, Kundaković-Vasović T, Crnobarac J. Nitrogen fertilization and the essential oils profile of the rhizomes of different sweet flag populations (*Acorus calamus* L.). ***Industrial Crops and Products*** 2019; 142: 111871. doi: 10.1016/j.indcrop.2019.111871

Kolundžić M, Grozdanić NĐ, Dodevska M, Milenković M, Sisto F, Miani A, Farronato G, Kundaković T. Antibacterial and cytotoxic activities of wild mushroom *Fomes fomentarius* (L.) Fr., Polyporaceae. ***Industrial Crops and Products*** 2016; 79: 110-115. doi: 10.1016/j.indcrop.2015.10.030

Tošić S, Stojičić D, Slavkovska V, Mihailov-Krstev T, Zlatković B, Budimir S, Uzelac B. Phytochemical composition and biological activities of native and in vitro-propagated *Micromeria croatica* (Pers.) Schott (Lamiaceae). ***Planta*** 2019; 249: 1365-1377. doi: 10.1007/s00425-018-03071-5

Milenković M, Stošović J, Slavkovska V: Synergy between essential oils of *Calamintha* species (Lamiaceae) and antibiotics. ***Natural Product Communications*** 2018; 13 (3): 371-374.

Slavkovska V, Lakušić B, Lakušić D, Jančić R. Leaf and stem anatomy of *Micromeria* Benth. species from the Central part of the Balkan Peninsula. ***Biologia*** 2017; 72(3): 277-291. doi: 10.1515/biolog-2017-0029

Arsenijević J, Drobac M, Šoštarić I, Ražić S, Milenković M, Couladis M, Maksimović Z. Bioactivity of herbal tea of Hungarian thyme based on the composition of volatiles and polyphenolics. ***Industrial crops and products*** 2016; 89: 14-20. doi: 10.1016/j.indcrop.2016.04.046

Samardžić S, Tomić M, Pecikoza U, Stepanović-Petrović R, Maksimović Z. Antihyperalgesic activity of *Filipendula ulmaria* (L.) Maxim. and *Filipendula vulgaris* Moench in a rat model of inflammation. ***Journal of Ethnopharmacology*** 2016; 193: 652-656. doi: 10.1016/j.jep.2016.10.024

Ušjak LJ, Milutinović VM, Đorđić Crnogorac MJ, Stanojković TP, Niketić MS, Kukić-Marković JM, Petrović SD. Barks of three wild *Pyrus* taxa: phenolic constituents, antioxidant activity, and *in vitro* and *in silico* investigations of *α*-amylase and *α*-glucosidase inhibition. ***Chemistry & Biodiversity*** 2021; 18(10): e2100446. doi: 10.1002/cbdv.202100446

Drobac M, Petrović S, Milenković M, Couladis M, Kukić-Marković J, Niketić M. Composition and antimicrobial properties of essential oils of *Laser trilobum* rhizomes and fruits. ***Natural product communications*** 2017; 12(3): 1934578X1701200335.

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Mićović T, Topalović D, Živković L, Spremo-Potparević B, Jakovljević V, Matić S, Popović S, Baskić D, Stešević D, Samardžić S, Stojanović D, Maksimović Z. Antioxidant, antigenotoxic and cytotoxic activity of essential oils and methanol extracts of *Hyssopus officinalis* L. subsp. *aristatus* (Godr.) Nyman (Lamiaceae). ***Plants*** 2021; 10(4): 711. doi: 10.3390/plants10040711

Ilić MD, Marčetić MD, Zlatković BK, Lakušić BS, Kovačević NN, Drobac MM. Chemical composition of volatiles of eight *Geranium* L. species from Vlasina Plateau (south eastern Serbia). ***Chemistry & Biodiversity*** 2020; 17(2): e1900544. doi: 10.1002/cbdv.201900544

Kolundžić M, Stanojković T, Radović J, Tačić A, Dodevska M, Milenković M, Sisto F, Masia C, Farronato G, Nikolić V, Kundaković T. Cytotoxic and antimicrobial activities of *Cantharellus cibarius* Fr.(Cantarellaceae). ***Journal of Medicinal Food*** 2017; 20(8): 790-796. doi: 10.1089/jmf.2016.0176

Arsenijević J, Drobac M, Šoštarić I, Jevđović R, Živković J, Ražić S, Moravčević Đ, Maksimović Z. Comparison of essential oils and hydromethanol extracts of cultivated and wild growing *Thymus pannonicus* All. ***Industrial Crops and Products*** 2019;130: 162-169. doi: 10.1016/j.indcrop.2018.12.055

Zbiljić M, Lakušić B, Marčetić M, Bogdanović S, Lakušić D. Morphological and chemical evidence of *Teucrium× rohlenae* K. Malý (Lamiaceae), a new hybrid in Croatia. ***Acta Botanica Croatica*** 2021; 80(1): 48-55. doi: 10.37427/botcro-2020-033

Ušjak L, Petrović S, Drobac M, Soković M, Stanojković T, Ćirić A, Niketić M. Essential oils of three cow parsnips–composition and activity against nosocomial and foodborne pathogens and food contaminants. ***Food & Function*** 2017; 8(1): 278-290.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. BRANISLAVA MILJKOVIĆ

## PHARMACOKINETICS AND CLINICAL PHARMACY

| | |
|---|---|
| Research topic title: | Identification and quantification of sources of pharmacokinetic and variability in drug response - an aspect of efficacy and safety of therapy |
| RG members: | Dr. Branislava Miljković, Full Professor<br>Dr. Sandra Vezmar Kovačević, Full Professor<br>Dr. Katarina Vučićević, Associate Professor<br>Dr. Marija Jovanović, Assistant Professor<br>Dr. Milica Ćulafić, Teaching Assistant<br>Dr. Milena Kovačević, Teaching Assistant<br>Mr. Pharm. Maša Roganović, Teaching Assistant<br>Mr. Pharm. Ana Homšek, Teaching Assistant |
| Equipment and methods: | *NONMEM and Monolix software for pharmacokinetic and pharmacokinetic-pharmacodynamic modeling and simulation of clinical data. The aim of the analysis is to obtain mathematical-statistical models for describing the behavior of a drug during therapy and to optimize the drug dosing regimen according to the patient's individual needs.*<br>*Drug pharmacokinetics in animal studies.*<br>*PASW Statistics*<br>*Tools for identifying clinically significant drug-drug interactions (LexiInteract, epocrates, Medscape)* |
| Projects/funding: | Institutional funding through contract with the Ministry of Education, Science and Technological Development, Republic of Serbia, Grant Agreement No 451-03-9/2021-14/200161.<br>COST European Network on Understanding Gastrointestinal Absorption-related Processes (UNGAP), No.16205. (24.10.2017- 23.04.2022) Associate Professor Katarina Vučićević is the leader of the working group 1 (WG1). |
| Collaborations: | Faculty of Pharmacy-University of Ljubljana, Slovenia<br>Clinic for Gastroenterology and Hepatology, Clinical Center of Serbia<br>Military Medical Academy<br>University Medical Center "Zvezdara"<br>Faculty of Pharmacy-University of Lisbon, Portugal<br>Faculty of Pharmacy-University of Marseille, France<br>The Institute for Oncology and Radiology of Serbia<br>Clinic for Nephrology, Clinical Center of Serbia<br>Clinic for Psychiatry Clinical Center of Serbia<br>University Children's Hospital, Belgrade<br>Institute of Mother and Child Health Care of Serbia "Dr Vukan Čupić"<br>Faculty of Medicine-University of Belgrade<br>Faculty of Medicine - Department of Pharmacy, University of Banja Luka, the Republic of Srpska |

# RESEARCH GROUP
# PROF. BRANISLAVA MILJKOVIĆ

## Selected publications


Milenković B, Šuljagić V, Perić A, Dragojević-Simić V, Tarabar O, Milanović M, Putić V, Tomić D, Miljković B, Vezmar Kovačević S. Outcomes of *Clostridioides difficile* infection in adult cancer and non-cancer patients hospitalised in a tertiary hospital: a prospective cohort study. Eur J Hosp Pharm. 2021:ejhpharm-2020-002574.

Jayachandran P, Garcia-Cremades M, Vučićević K, Bumpus NN, Anton P, Hendrix C, Savić R. A Mechanistic *In Vivo*/*Ex Vivo* PharmacokineticPharmacodynamic Model of Tenofovir for HIV Prevention. CPT Pharmacometrics Syst Pharmacol. 2021; 10(3): 179-87.

Kovacevic T, Kovacevic SV, Stanetic M, Kovacevic P, Miljkovic B. Impact of pharmacist's intervention on decreasing erlotinib interactions in the treatment of lung cancer patients in low resource settings. J Oncol Pharm Pract. 2021;27(2):350-358.

Ćulafić M, Vezmar-Kovačević S, Dopsaj V, Oluić B, Bidžić N, Miljković B, Ćulafić Đ. Pentoxifylline with metformin treatment improves biochemical parameters in patients with nonalcoholic steatohepatitis. J Med Biochem. 2020;39(3):290-298.

Kovacevic T, Miljkovic B, Kovacevic P, Dragic S, Momcicevic D, Avram S, Jovanovic M, Vucicevic K. Population pharmacokinetic model of Vancomycin based on therapeutic drug monitoring data in critically ill septic patients. J Crit Care. 2020;55:116-121.

Jovanović M, Vučićević K, Miljković B. Understanding variability in the pharmacokinetics of atypical antipsychotics - focus on clozapine, olanzapine and aripiprazole population models. Drug Metab Rev. 2020;52(1):1-18.

Kovačević M, Vezmar Kovačević S, Radovanović S, Stevanović P, Miljković B. Potential drug-drug interactions associated with clinical and laboratory findings at hospital admission. Int J Clin Pharm. 2020;42(1):150-157.

Kovačević M, Vezmar Kovačević S, Radovanović S, Stevanović P, Miljković B. Adverse drug reactions caused by drug-drug interactions in cardiovascular disease patients: introduction of a simple prediction tool using electronic screening database items. Curr Med Res Opin. 2019;35(11):1873-1883.

Culafic M, Vezmar Kovacevic S, Dopsaj V, Stulic M, Vlaisavljevic Z, Miljkovic B, Culafic D. A Simple Index for Nonalcoholic Steatohepatitis-HUFA-Based on Routinely Performed Blood Tests. Medicina (Kaunas). 2019;55(6):243.

Golubović B, Vučićević K, Radivojević D, Kovačević SV, Prostran M, Miljković B. Exploring Sirolimus Pharmacokinetic Variability Using Data Available from the Routine Clinical Care of Renal Transplant Patients - Population Pharmacokinetic Approach. J Med Biochem. 2019;38(3):323-331.

Pejčić Z, Vučićević K, García-Arieta A, Miljković B. Adjusted indirect comparisons to assess bioequivalence between generic clopidogrel products in Serbia. Br J Clin Pharmacol. 2019;85(9):2059-2065.

Erika Wallender, Katarina Vucicevic, Prasanna Jagannathan, Liusheng Huang, Paul Natureeba, Abel Kakura, Mary Muhindo, Mirium Nakalembe, Diane Havlir, Moses Kamya, Francesca Aweeka, Grant Dorsey, Philip J. Rosenthal, Radojka M. Savic. Predicting optimal dihydroartemisinin-piperaquine regimens to prevent malaria during pregnancy for HIV-infected women receiving efavirenz. J Infect Dis 2018; 217(6): 964-72.

Topić Vučenović V, Rajkovača Z, Jelić D, Stanimirović D, Vuleta G, Miljković B, Vučićević K. Investigation of factors influencing radioiodine (131I) biokinetics in patients with benign thyroid disease using nonlinear mixed effects approach. Eur J Clin Pharmacol. 2018;74(8):1037-1045.

Vučićević KM, Miljković BR, Golubović BC, Jovanović MN, Vezmar Kovačević SD, Ćulafić MD, Kovačević MM, de Gier JJ. Expectations, concerns, and needs of patients who start drugs for chronic conditions. A prospective observational study among community pharmacies in Serbia. Eur J Gen Pract. 2018;24(1):19-25.

Kovačević SV, Miljković B, Ćulafić M, Kovačević M, Golubović B, Jovanović M, Vučićević K, de Gier JJ. Evaluation of drug-related problems in older polypharmacy primary care patients. J Eval Clin Pract. 2017;23(4):860-865.

Ilić V, Bogićević D, Miljković B, Ješić M, Kovačević M, Prostran M, Kovačević SV. Duration of valproic acid monotherapy correlates with subclinical thyroid dysfunction in children with epilepsy. Epileptic Disord. 2016;18(2):181-186.

Golubovic B, Prostran M, Miljkovic B, Vucicevic K, Radivojevic D, Grabnar I. Population Pharmacokinetic Approach of Immunosuppressive Therapy in Kidney Transplant Patients. Curr Med Chem. 2016;23(19):1998-2011.

Jovanović M, Sokić D, Grabnar I, Vovk T, Prostran M, Erić S, Kuzmanovski I, Vučićević K, Miljković B. Application of Counter-propagation Artificial Neural Networks in Prediction of Topiramate Concentration in Patients with Epilepsy. J Pharm Pharm Sci. 2015;18(5):856-862.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. MIROSLAV SAVIĆ

## P H A R M A C O L O G Y

**Research topics titles:**

Behavioral and pharmacokinetic characterization of newly synthesized ligands selective for distinct subtypes of $GABA_A$ receptor benzodiazepine binding site
Creating novel integrated tools for the preclinical prediction of adverse effects of pharmaceuticals on the nervous system

**RG members:**

Dr. Miroslav Savić, Full Professor
Dr. Tamara Major
Dr. Ivan Jančić, Assistant Professor
Dr. Bojan Batinić, Assistant Professor
Mr. Pharm. Branka Divović Matović, Teaching Assistant
Mr. Pharm. Aleksandra Kovačević, Teaching Assistant
Jovana Aranđelović
Vladimir Stevanović

External collaborators:
Dr. Siniša Karasek
Dr. Aleksandar Obradović
Dr. Vanja Todorović
Anja Santrač
Milica Gajić Bojić

**Equipment and methods:**

Rotarod for Rats (Ugo Basile, Italy; model: 47700)
Grip Strength Meter for Rats (Ugo Basile, Italy; model: 47105)
Digital Lab Standard Stereotaxic Instrument for Rats (Stoelting, Ireland; model: 51900)
Bussey-Saksida Touch Screen Systems for Rodents (Lafayette Instrument, Loughborough, England, UK; model: 80604-20)
Luminex 200 system with PONENT 4.2. software (Luminex Corporation, Austin, Texas, USA; model: Luminex 200)

Behavioral testing of rodents (in Morris water maze, elevated plus maze, rotarod, open field test, grip strength test, sucrose preference test, forced swim test, three-chamber test, impulsivity test, affective bias test...)
Measurement of ligands concentration in blood, brain and other rodent organs and body fluids and pharmacokinetic characterization of ligands

**Projects/funding:**

Horizon 2020 Research and Innovation action – Innovative Medicines Initiative (IMI2 – Call 13) and European Federation of Pharmaceutical Industries and Associations (EFPIA) project: "De-escalation of neurotoxicity risk in preclinical drug discovery" (NeuroDeRisk), grant agreement no. 821528, 2019-2022, 696 150 €

Project of the Ministry of Education, Science and Technological Development, Republic of Serbia no. 175076: "Behavioral effects following repeated administration of newly synthesized ligands selective for distinct subtypes of $GABA_A$ receptor benzodiazepine binding site: comparison with standard psychopharmacologic drugs" from basic research – Medicine (currently financed through the Grant Agreement on the implementation and financing of scientific research at University of Belgrade – Faculty of Pharmacy in 2021, registration no. 451-03-9/2021-14/200161)

Bilateral cooperation project with the Republic of Austria (Medical University of Vienna): “Involvement of $GABA_A$ receptors in modulation of neuropathic pain in animal models”, 451-03-02141/2017-09/05, 2018-2021.

# RESEARCH GROUP
# PROF. MIROSLAV SAVIĆ

Collaborations:

University of Belgrade – Faculty of Pharmacy - dr Bojan Marković, dr Vladimir Dobričić, research groups of dr Snežana Savić, dr Marin Jukić
National Institute of Nuclear Sciences “Vinča”, Serbia
Medical University of Vienna, Austria
University of Toronto and Campbell Family Mental Health Research Institute, Canada
University of Wisconsin-Milwaukee, USA

Selected publications


Andronis C, Silva JP, Lekka E, Virvilis V, Carmo H, Bampali K, Ernst M, Hu Y, Loryan I, Richard J, Carvalho F, **Savić MM**. Molecular basis of mood and cognitive adverse events elucidated via a combination of pharmacovigilance data mining and functional enrichment analysis. Arch Toxicol. 2020;94:2829-2845.

Sieghart W, **Savić MM**. International Union of Basic and Clinical Pharmacology. CVI: $GABA_A$ Receptor Subtype- and Function-selective Ligands: Key Issues in Translation to Humans. Pharmacol Rev. 2018;70:836-878.

Mitrović JR, **Divović B**, Knutson DE, Đoković JB, Vulić PJ, Randjelović DV, Dobričić VD, Čalija BR, Cook JM, **Savić MM**, Savić SD. Nanocrystal dispersion of DK-I-56-1, a poorly soluble pyrazoloquinolinone positive modulator of α6 $GABA_A$ receptors: Formulation approach toward improved in vivo performance. Eur J Pharm Sci. 2020;152:105432.

Knutson DE, Kodali R, **Divović B**, Treven M, Stephen MR, Zahn NM, Dobričić V, Huber AT, Meirelles MA, Verma RS, Wimmer L, Witzigmann C, Arnold LA, Chiou LC, Ernst M, Mihovilovic MD, **Savić MM**, Sieghart W, Cook JM. Design and Synthesis of Novel Deuterated Ligands Functionally Selective for the γ-Aminobutyric Acid Type A Receptor ($GABA_A$ R) α6 Subtype with Improved Metabolic Stability and Enhanced Bioavailability. J Med Chem. 2018;61:2422-2446.

Vasović D, **Divović B**, Treven M, Knutson DE, Steudle F, Scholze P, **Obradović A**, Fabjan J, Brković B, Sieghart W, Ernst M, Cook JM, **Savić MM**. Trigeminal neuropathic pain development and maintenance in rats are suppressed by a positive modulator of α6 $GABA_A$ receptors. Eur J Pain. 2019;23:973-984.

Prevot TD, Li G, **Vidojevic A**, Misquitta KA, Fee C, **Santrac A**, Knutson DE, Stephen MR, Kodali R, Zahn NM, Arnold LA, Scholze P, Fisher JL, Marković BD, Banasr M, Cook JM, **Savic M**, Sibille E. Novel Benzodiazepine-Like Ligands with Various Anxiolytic, Antidepressant, or Pro-Cognitive Profiles. Mol Neuropsychiatry. 2019;5:84-97.

**Batinić B**, **Santrač A**, **Jančić I**, Li G, **Vidojević A**, Marković B, Cook JM, **Savić MM**. Positive modulation of α5 $GABA_A$ receptors in preadolescence prevents reduced locomotor response to amphetamine in adult female but not male rats prenatally exposed to lipopolysaccharide. Int J Dev Neurosci. 2017;61:31-39.

**Bojić MG**, Todorović L, **Santrač A**, Mian MY, Sharmin D, Cook JM, **Savić MM**. Vasodilatory effects of a variety of positive allosteric modulators of $GABA_A$ receptors on rat thoracic aorta. Eur J Pharmacol. 2021;899:174023.

**Savić MM**, Huang S, Furtmüller R, Clayton T, Huck S, Obradović DI, Ugrešić ND, Sieghart W, Bokonjić DR, Cook JM. Are $GABA_A$ receptors containing alpha5 subunits contributing to the sedative properties of benzodiazepine site agonists? Neuropsychopharmacology. 2008;33:332-9.

**Savić MM**, Clayton T, Furtmüller R, Gavrilović I, Samardzić J, Savić S, Huck S, Sieghart W, Cook JM. PWZ-029, a compound with moderate inverse agonist, functional selectivity at $GABA_A$ receptors containing alpha5 subunits, improves passive, but not active, avoidance learning in rats. Brain Res. 2008;1208:150-9.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. RADICA STEPANOVIĆ-PETROVIĆ

## P H A R M A C O L O G Y

| | |
|---|---|
| Research topic title: | Examination of the mechanisms of action, interactions and adverse effects of alternative analgesics in animal pain models. |
| RG members: | Dr. Radica Stepanović-Petrović, Full Professor<br>Dr. Maja Tomić, Full Professor<br>Dr. Ana Micov, Assistant Professor<br>Dr. Uroš Pecikoza, Teaching Assistant<br>Mr. Pharm. Katarina Nastić |
| Equipment and methods: | The tail flick apparatus<br>The apparatus for carrying out the paw pressure test<br>Electronic von Frey Anesthesiometer<br>The apparatus for measuring the mice/rats paw volume (plethysmometer)<br>Ugo Basile 47700 Rotarod<br>Grip Strength Meter for rat |
| Projects/ funding: | MESTD institutional financing Grant No: 451-03-9/2021-14/200161. |
| Collabora-tions: | **University of Belgrade - Faculty of Pharmacy**<br>Research team Djekić Lj, Krajišnik D<br>Research team Leposavić G,<br>Research team Petrovic S, Maksimović Z<br>**Institute of Molecular Genetics and Genetic Engineering (IMGGE)**<br>Research team Golić N and Dinić M<br>**University of Belgrade - Faculty of Biology**<br>Research team Jasnić N and Djordjević J |

# RESEARCH GROUP
# PROF. RADICA STEPANOVIĆ-PETROVIĆ

Selected publications


**Micov AM**, **Tomić MA**, Todorović MB, Vuković MJ, **Pecikoza UB**, Jasnic NI, Djordjevic JD, **Stepanović-Petrović RM**. Vortioxetine reduces pain hypersensitivity and associated depression-like behavior in mice with oxaliplatin-induced neuropathy. Prog Neuropsychopharmacol Biol Psychiatry. 2020;103:109975. (IF=5.067/2020)

**Tomić M**, **Pecikoza U**, **Micov A**, Vučković S, **Stepanović-Petrović R**. Antiepileptic drugs as analgesics/adjuvants in inflammatory pain: current preclinical evidence. Pharmacol Ther. 2018;192:42-64. (IF= 12.310/2020)

**Pecikoza UB**, **Tomić MA**, **Micov AM**, **Stepanović-Petrović RM**. Metformin Synergizes With Conventional and Adjuvant Analgesic Drugs to Reduce Inflammatory Hyperalgesia in Rats. Anesth Analg. 2017;124:1317-1329. (IF= 5.108/2020)

**Tomić MA**, **Pecikoza UB**, **Micov AM**, **Stepanović-Petrović RM**. The Efficacy of Eslicarbazepine Acetate in Models of Trigeminal, Neuropathic, and Visceral Pain: The Involvement of 5-HT1B/1D Serotonergic and CB1/CB2 Cannabinoid Receptors. Anesth Analg. 2015;121:1632-9. (IF= 5.108/2020)

**Stepanović-Petrović RM**, **Micov AM**, **Tomić MA**, Kovačević JM, Bošković BD. Antihyperalgesic/antinociceptive effects of ceftriaxone and its synergistic interactions with different analgesics in inflammatory pain in rodents. Anesthesiology. 2014;120:737-750. (IF= 7.892/2020)

**Stepanović-Petrović RM**, **Micov AM**, **Tomić MA**, Ugrešić ND. The local peripheral antihyperalgesic effect of levetiracetam and its mechanism of action in an inflammatory pain model. Anesth Analg. 2012;115:1457-66. (IF= 5.108/2020)

**Micov A**, **Tomić M**, Popović B, **Stepanović-Petrović R**. The antihyperalgesic effect of levetiracetam in an inflammatory model of pain in rats: mechanism of action. Br J Pharmacol. 2010;161:384-392. (IF=8.379/2020)

**Stepanović-Petrović RM**, **Tomic MA**, Vuckovic SM, Paranos S, Ugresic ND, Prostran MS, Milovanovic S, Boskovic B. The antinociceptive effects of anticonvulsants in a mouse visceral pain model. Anesth Analg. 2008;106:1897-903. (IF= 5.108/2020)

Vuković SM, **Tomić MA**, **Stepanović-Petrović RM**, Ugresić N, Prostran MS, Bosković B. The effects of alpha2-adrenoceptor agents on anti-hyperalgesic effects of carbamazepine and oxcarbazepine in a rat model of inflammatory pain. Pain. 2006;125:10-9. (IF= 6.961/2020)

**Tomić MA**, Vučković SM, **Stepanović-Petrović RM**, Ugrešić N, Prostran MS, Bošković B. The anti-hyperalgesic effects of carbamazepine and oxcarbazepine are attenuated by treatment with adenosine receptor antagonists. Pain. 2004;111:253-260. (IF= 6.961/2020)


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP ASST. PROF. ALEKSANDRA JANOŠEVIĆ-LEŽAIĆ

## P H Y S I C A L  C H E M I S T R Y

| | |
|---|---|
| Research topic title: | Syntesis and characterization of polymeric materials and composites based on heteropoly compounds with the aim of their applycation in slectroconversion, pharmacy and reactions of importance for environmental protection |
| RG members: | Dr. Snežana Uskoković-Marković, Associate Professor<br>Dr. Aleksandra Janošević-Ležaić, Assistant Professor |
| Equipment and methods: | Amel Instruments, Italy, A MEL 433-A Polarographic Analyser;<br>UV/Vis spectrophotometer, GBC Scientific Equipment, Australia, Cintra 20;<br>Raman spectrometer, Ahura Scientific, Waltham, USA, PortableTruScan. |
| Projects/ funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161 |
| Collabora-tions: | Univerzitet u Beogradu - Fakultet za fizičku hemiju;<br>Department of Inorganic Chemistry, Institute of Chemistry of Romanian Academy, Timisoara, Romania;<br>Advanced Materials Department, Institut Jožef Stefan, Ljubljana, Slovenija;<br>Institute of Macromolecular Chemistry, Czech Academy of Sciences, Prague, Czech Republic |

# RESEARCH GROUP
# ASSIST. PROF. ALEKSANDRA JANOŠEVIĆ-LEŽAIĆ

Selected publications


D Janićijević, **S Uskoković-Marković**, D Ranković, M Milenković, A Jevremović, B Nedić Vasiljević, M Milojević-Rakić, D Bajuk-Bogdanović, Double active BEA zeolite/silver tungstophosphates – Antimicrobial effects and pesticide removal. Science of the Total Environment, 2020, 735, 139630.

Z Jovanović, Ž Mravik, D Bajuk-Bogdanović, S Jovanović, S Marković, M Vujković, J Kovač, D Vengust, **S Uskoković-Marković**, I Holclajtner-Antunović. Self-limiting interactions in 2D–0D system: A case study of graphene oxide and 12-tungstophosphoric acid nanocomposite. Carbon, 156, 2020, 166-178.

I Holclajtner-Antunović, **S Uskoković-Marković**, A Popa, A Jevremović, B Nedić Vasiljević, M Milojević-Rakić, D Bajuk-Bogdanović. Ethanol dehydration over Keggin type tungstophosphoric acid and its potassium salts supported on carbon. Reaction Kinetics, Mechanisms and Catalysis 2019, 128(1), 121-137.

Kashima K., Fujisaki T., Serrano-Luginbühl S., Kissner R., **Janošević Ležaić A.**, Bajuk-Bogdanović D., Ćirić-Marjanović G., Busato S., Ishikawa T., Walde P.: Effect of Template Type on the Trametes versicolor Laccase-Catalyzed Oligomerization of the Aniline D

Pašti I, **Janošević Ležaić A.**, Gavrilov N., Ćirić-Marjanović G., Mentus S.: Nanocarbons derived from polymers for electrochemical energy conversion and storage. *Synthetic Metals* (2018) 246:267-281

**Janošević Ležaić A.**, Bajuk-Bogdanović D., Radoičić M., M. Mirsky V., Ćirić-Marjanović G.: Influence of synthetic conditions on the structure and electrical properties of nanofibrous polyanilines and their nanofibrous carbonized forms, *Synthetic Metals* 214, (2016)

Pašti I., **Janošević Ležaić A.,** Ćirić-Marjanović G., Mirsky V.: Resistive gas sensors based on the composites of nanostructured carbonized polyaniline and Nafion. *Journal of Solid State Electrochemistry*, 20(11), (2016) 3061-3069


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. NELI KRISTINA TODOROVIĆ VASOVIĆ

## P H Y S I C S  A N D  M A T H E M A T I C S

| | |
|---|---|
| Research topic title: | Modeling and numerical simulations of complex multiparticle systems |
| RG members: | Dr. Neli Kristina Todorović Vasović, Full Professor<br>Dr. Dragana Ranković, Assistant Professor<br>MSc. Math. Danijela Milenković, Teaching Assistant<br>MSc. Math. Marija Minić, Teaching Assistant |
| Equipment and methods: | Matlab<br>R<br>Python<br>Origin |
| Projects/ funding: | Institutional funding through the Grant Agreement with MPNTR, no. 451-03-9 / 2021-14 / 200161 |
| Collabora-tions: | Institute of Physics Belgrade<br>Faculty of Mathematics, University of Belgrade<br>Faculty of Science, University of Novi Sad |
| Selected publications | Prekrat D., Todorović-Vasović K.N., Ranković D., Detecting scaling in phase transitions on the truncated Heisenberg algebra, Journal of High Energy Physics, 2021, 2021(3), 197<br>Kostić S., Vasović N., Todorović K., Franović I., EFFECT of colored noise on the generation of seismic fault MOVEMENT: Analogy with spring-block model DYNAMICS, Chaos, Solitons and Fractals, 2020, 135, 109726<br>Kostić S., Vasović N., Todorović K., Franović I., Nonlinear dynamics behind the seismic cycle: One-dimensional phenomenological modeling, Chaos, Solitons and Fractals, 2018, 106, pp. 310–316<br>Kostić S., Vasović N., Franović I., Klinshov V., Nekorkin V., Dynamics of fault motion in a stochastic spring-slider model with varying neighboring interactions and time-delayed coupling, Nonlinear Dynamics, 2017, 87(4), pp. 2563–2575<br>Vasović N., Kostić S., Franović I., Todorović K., Earthquake nucleation in a stochastic fault model of globally coupled units with interaction delays, Communications in Nonlinear Science and Numerical Simulation, 2016, 38, pp. 117–129 |

*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# ASST. PROF. MARIN JUKIĆ

## P H Y S I O L O G Y

Research topics titles:

**Neurobiology of Emotions (NEMO)**
Impact of brain development in emotionality
Precise dosing of antipsychotics and antidepressants

RG members:

**Permanent team members**
Dr. Marin Jukić, Assistant Professor
Mr. Pharm. Filip Milosavljević, PhD student
Mr. Pharm. Aleksandra Jeremić, PhD student
Dr. Zorana Pavlović (Psychiatrist, Faculty of Medicine and Clinical center of Serbia-Psychiatry Clinic)
Dr. Čedo Miljević, Assistant Professor (Psychiatrist, Faculty of Medicine and Institute for Mental Health)
Dr. Zvezdana Stojanović, Assistant Professor (Psychiatrist, Military Medical Academy – Faculty of Medicine and Psychiatry Clinic)
Itc. Dr. Danilo Joković (Psychiatrist, Military Medical Academy – Psychiatry Clinic)

**Team members on the NEMO group projects**
Dr. Bojan Batinić, Assistant Professor (PsyCise project)
Dr. Bojan Marković, Associate Professor (PsyCise project)
Dr. Sandra Vladimirov (PsyCise project)

Equipment:

QuantStudio 5 – rtPCR machine
FujiLAS-1000plus – Chemiluminiscent and fluorescent imager
Transcardial perfusion pump for rodents
Nitrogen vaporizer with nitrogen generator
Small equipment for PCR i HPLC sample preparation

Methods:

Post mortem high resolution MRI of rodent brain (collaboration with Karolinska Institute – KERIC neuroimaging center)
Rodent Behavior analysis
Western Blot
rtPCR – genotyping and gene expression analysis
Imunohistochemistry
Therapeutic drug monitoring of psychiatric drugs

# RESEARCH GROUP
# ASST. PROF. MARIN JUKIĆ

Projects/ funding:

**PsyCise** – Science Fund of the Republic of Serbia 199.872,88 EUR
**PGx-PSY** – Hoziron 2020 research and innovation 484.981,25 EUR
**Pokreni se za nauku** initiative 1.200.000 RSD

Collaborations:

**University of Belgrade – Faculty of Pharmacy**
Prof. Vesna Pešić group
Prof. Miroslav Savić group
Prof. Svetlana Ignjatović group
Department for pharmaceutical chemistry (HPLC apparatus/method)
Department for medical biochemistry (HPLC apparatus/method)

**University of Belgrade – Faculty of Medicine**
Prof. Nađa Marić Bojović group
Prof Branislav Filipović group

**International collaborations**
Karolinska Institute, Stockholm, Sweden; Magnus Ingelman-Sundberg group
Karolinska Institute, Stockholm, Sweden; Peter Damberg (KERIC neuroimaging center)
Stockholm University, Sweden; Chunliang Wang group
Oslo University, Norway; Espen Molden group
Medical University Vienna, Austria; Rupert Lanzenberger group
Muenster University, Germany; Udo Danlowski group
Bonn University, Germany; Marcus Noethen group
University of Maryland, Bethesda, USA; Todd Gould group
Mastricht University, the Nederlands; Roos van Westerhenen group
Toronto University, Canada; Rachel Tyndale group

Selected publications:


Milosavljevic F, Bukvic N, Pavlovic Z, Miljevic C, Pešic V, Molden E, Ingelman-Sundberg M, Leucht S, Jukic MM. Association of CYP2C19 and CYP2D6 Poor and Intermediate Metabolizer Status With Antidepressant and Antipsychotic Exposure: A Systematic Review and Meta-analysis. ***JAMA Psychiatry***. 2020 Nov 25 (ahead of print)

Jukic MM, Smith RL, Haslemo T, Molden E, Ingelman-Sundberg M. Effect of CYP2D6 genotype on exposure and efficacy of risperidone and aripiprazole: a retrospective, cohort study. ***Lancet Psychiatry*** 2019 May;6(5):418-426.

Jukic MM, Haslemo T, Molden E, Ingelman-Sundberg M. Impact of CYP2C19 Genotype on Escitalopram Exposure and Therapeutic Failure: A Retrospective Study Based on 2,087 Patients. ***Am J Psychiatry*** 2018 May 1;175(5):463-470.

Jukić MM, Opel N, Ström J, Carrillo-Roa T, Miksys S, Novalen M, Renblom A, Sim SC, Peñas-Lledó EM, Courtet P, Llerena A, Baune BT, de Quervain DJ, Papassotiropoulos A, Tyndale RF, Binder EB, Dannlowski U, Ingelman-Sundberg M. Elevated CYP2C19 expression is associated with depressive symptoms and hippocampal homeostasis impairment. ***Mol Psychiatry.*** 2017 Aug;22(8):1155-1163.

Jukic MM, Carrillo-Roa T, Bar M, Becker G, Jovanovic VM, Zega K, Binder EB, Brodski C. Abnormal development of monoaminergic neurons is implicated in mood fluctuations and bipolar disorder. ***Neuropsychopharmacology***. 2015 Mar;40(4):839-48.


*Full bibliography:*
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# RESEARCH GROUP
# PROF. VESNA PEŠIĆ

## P H Y S I O L O G Y

| | |
|---|---|
| Research topics titles: | NEUROSCIENCE<br>Stress and depression<br>Neuroendocrinology<br>Neuromodulatory role of oxyitocin<br>Ketamine as rapid acting antidepressant |
| RG members: | <u>Department of Physiology</u><br>Dr. Vesna Pešić, Full Professor<br>Dr. Dušanka Stanić, Assistant Professor<br>Dr. Bojan Batinić, Assistant Professor<br>Dr. Jelena Petrović, Teaching Assistant<br>Mr. Pharm. Ana Ivanović, Teaching Assistant<br>MD Gorana Nikolašević, Teaching Assistant<br><br><u>Institute for Mental Health, Faculty of Medicine</u><br>Dr. Bojana Pejušković, Assistant Professor (psychiatrist)<br>MD Mihailo Ilić<br>MD Neda Ognjanović<br>MD Jelena Đekić<br>MD Marija Lero<br><br>Dr. Marija Kundaković, Assistant Professor, Fordham University, New York, USA-consultant |
| Equipment and methods: | Brain tissue analysis – Western Blot, Immunohistochemistry<br>RT-PCR – gene expression in cells of patients and experimental animals<br>Behavioral testing - FST, NORT, LDB etc.<br>Neurobiochemistry –analysis of levels of neurotransmitters and hormones<br>Cell cultures laboratory |
| Projects/funding: | COST project CONNECT CA19127 nephro-neurology<br>Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161 |

# RESEARCH GROUP
# PROF. VESNA PEŠIĆ

Collabora-tions:

**Faculty of Pharmacy, University of Belgrade**
dr. Marin Jukić group
dr. Svetlana Ignjatović group
Department for Pharmaceutical chemistry

**Institute for Mental Health, Belgrade**

**Faculty of Medicine, University of Belgrade**
• Department for histology and embryology
• Department for biochemistry

**International collaboration**
• Sagol school of neuroscience, Tel Aviv, Israel
• Sackler faculty of medicine, University of Tel Aviv, Israel
• Department of physiology and pharmacology, Karolinska Institute, Stockholm Sweden
• Goethe Universitat, Frankfurt am Main, Department of Psychiatry, Psychosomatic and Psychotherapy
• Fordham University, Department of Biological science, New York, USA

Selected publications:


Stanić D., Oved K., Israel-Elgali I., Jukić M., Batinić B., Puškaš N., Shomron N., Gurwitz D., Pešić V.: Synergy of oxytocin and citalopram in modulating Itgb3/Chl1 interplay: relevance to sensitivity to SSRI therapy. Psychoneuroendocrinology 2021, 129 105234. category Psychiatry 41/216 IF=5.663

Stanić D., Plećaš-Solarović D., Mirković D., Jovanović P., Dronjak S., Marković B., Đorđević T., Ignjatović S., Vesna Pešić: Oxytocin in corticosterone-induces chronic stress model: Focus on adrenal gland function. Psychoneuroendocrinology 2017 80: 137-146, category Psychiatry 41/216 IF=5.663

Jelena Petrović, Dušanka Stanić, Zorica Bulat, Nela Puškaš, Milica Labudović-Borović, Bojan Batinić, Duško Mirković, Svetlana Ignjatović, and Vesna Pešić: ACTH-induced model of depression resistant to tricyclic antidepressants: Neuroendocrine and behavioral changes and influence of long-term magnesium administration. Hormones and Behavior 2018, 105: 1-10, category Behavioral Sciences 10/53 IF=4.304

Dangoor I., Stanić D., Reshef L., Pešić Vesna, Gophna U.: Specific changes in the mammalian gut microbiome as a biomarker for oxytocin-induced behavioral changes. Microorganisms 2021, 9 1938. category Microbiology 37/135 IF=4.152

Jelena Petrović, Vesna Pešić, Volker Lauschke: Frequencies of clinically important CYP2C19 and CYP2D6 alleles are graded across Europe. European Journal of Human Genetics 2020, 28: 88–94. category Genetics &Heredity 61/125 IF=4.440

Dušanka Stanić, Bosiljka Plećaš-Solarović, Jelena Petrović, Nataša Bogavac-Stanojević, Miron Sopić, Jelena Kotur-Stevuljević, Svetlana Ignjatović, and Vesna Pešić: Hydrogen peroxide-induced oxidative damage in peripheral blood lymphocytes from rats chronically treated with corticosterone: the protective effect of oxytocin treatment. Chemico- Biological interactions 2016, 256:134-141 category Pharmacology &Pharmacy 56/275 IF=5.192

Other publication on the website of the Department of Physiology


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. SVETLANA IGNJATOVIĆ

## M E D I C A L  B I O C H E M I S T R Y

| | |
|---|---|
| Research topic title: | Assessment of biomarkers of disease and organ dysfunction |
| RG members: | Dr. Svetlana Ignjatović, Full Professor<br>Dr. Aleksandra Topić, Full Professor<br>Dr. Miloš Žarković, Full Professor *<br>Dr. Jasmina Ćirić, Full Professor *<br>Dr. Biljana Nedeljković Beleslin, Assistant Professor *<br>Dr. Duško Mirković, Associate Professor<br>Dr. Mirjana Bećarević, Full Professor **<br>Dr. Neda Milinković, Teaching Assistant<br>Marija Sarić Matutinović, Research Trainee<br>* University of Belgrade-Faculty of Medicine<br>** University of Novi Sad-Faculty of Medicine |
| Equipment and methods: | • Deep freeze refrigerator, SANYO-3254 Ultra low<br>• Olympus AU400 biochemistry analyzer (Beckman Coulter)<br>• Access 2 immunochemical analyzer (Beckman Coulter)<br>• Hematological analyzer, Beckman Coulter, ACT DIFF<br>• Flow cytometer, BD Biosciences, USA, FA CSCALIBUR 4–COLOR<br>• Rayto ELISA reader and Rayto Mikroplate washer<br>• Liquid Chromatograph (HPLC), Shimadzu Corporation, Tokyo, Japan, HPLC Nexera i LC2040C 3D Liquid Chromatograph<br>• Ultra high pressure liquid chromatography with mass-mass detection (UHPLC/MS/MS), Thermo ACCELA Scientific), Agilent Technologies |

# RESEARCH GROUP
# PROF. SVETLANA IGNJATOVIĆ

| | |
|---|---|
| Projects/ funding: | 2011-2019: Biomarkers of organ damage and dysfunction (#175036); Complex diseases as a model system for studying the modulation of phenotype-structural and functional analysis of molecular biomarker (#173008)/Ministry of Education, Science and Technological Development, Republic of Serbia |
| Collabora-tions: | Research group from the Laboratory for Molecular Thyroid Research, Johannes Gutenberg University (JGU) Medical Centre in Mainz, Germany |
| Selected publications: | Ignjatovic S, Majkic-Singh N, Mitrovic M, Gvozdenovic M. Biochemical evaluation of patients with acute pancreatitis. Clin Chem Lab Med 2000; 38: 1141–4. |
| | Lukic V, Ignjatovic S. Optimizing moving average control procedures for small-volume laboratories: can it be done? Biochem Medica 2019;3:030710. |
| | Žarković M, et al. Asymmetry indicates more severe and active disease in Graves' orbitopathy: results from a prospective cross-sectional multicentre study. J Endocrinol Invest 2020;43: 1717–1722. |
| | Nedeljković-Beleslin B, Ćirić J, Stojković M, et al. Comparison of efficacy and safety of parenteral versus parenteral and oral glucocorticoid therapy in Graves' orbitopathy. Int J Clin Pract 2020 Jul 10;e13608. |
| | Topic A, Francuski Dj, Markovic B, et al. Gender-related reference intervals of urinary 8-oxo-7,8-dihydro-2′-deoxyguanosine determined by liquid chromatography-tandem mass spectrometry in Serbian population. Clin Biochem 2013;46:321-326. |
| | Becarevic M, Mirkovic D, Ignjatovic S. Double positivity of the IgG isotype of both anticardiolipin and anti-β2gpI antibodies is associated with the highest number of vascular impairment parameters in patients with primary antiphospholipid syndrome: preliminary data. Clin Rheumatol 2016;35:2947–54. |
| | Milinković N, Jovičić S, Ignjatović S. Measurement uncertainty as a universal concept: can it be universally applicable in routine laboratory practice? Crit Rev Clin Lab Sci 2020 Jul 16;1–12. doi: 0.1080/10408363.2020.1784838. |

*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. JELENA ANTIĆ STANKOVIĆ

## M I C R O B I O L O G Y

| | |
|---|---|
| Research topic title: | Investigation of antimicrobial and anti-proliferative compounds |
| RG members: | Dr. Jelena Antić Stanković, Full Professor<br>Dr. Dragana Božić, Associate Professor<br>Dr. Brankica Filipić, Associate Professor<br>Dr. Slađana Tanasković, Associate Professor<br>Dr. Branka Dražić, Assistant Professor |
| Equipment and methods: | Our group is mainly focused on pharmaceutical (medicinal) chemistry of the new compounds with potential antimicrobial activities and anti-proliferative effects. Also, we investigate antimicrobial and anti-proliferative effects of compounds of natural origin, especially essential oils, as well as new synthesized mixed-ligand transitional metal complexes with different macrocycles and additional aromatic and aliphatic carbocylates. The structure of the complexes is defined using physico-chemical methods.<br>We determine *in vitro* cytotoxic activity of samples according to cell lines originating from different types of cancer, as well as the selectivity of cytotoxic action on the established line of normal human cells. Also, we analyze the effect of samples from plant material on cell distribution at different stages of the cell cycle, as well as the type of cell death.<br>We use the diffusion, microdilution and agar microdilution method to determine the antimicrobial effect of the samples. |
| Projects/ funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161. |

# RESEARCH GROUP
# PROF. JELENA ANTIĆ STANKOVIĆ

## Selected publications


Mirjana Antonijević-Nikolić, Jelena Antić Stanković, Branka Dražić, Sladjana Tanasković, New macrocyclic Cu(II) complex with bridge terephthalate: synthesis, spectral properties, *in vitro* cytotoxic and antimicrobial activity. Comparison with related complexes, J Mol Struct. 2019, 1184(15):41-48

Antonijević-Nikolić M, Dražić B, Antić-Stanković J, Tanasković S New mixed-ligand Ni(II) and Zn(II) macrocyclic complexes with bridged bicyclo-[2,2,1]-hept-5-en-endo-2,3-cis-dicarboxylate: synthesis, characterization, antimicrobial and cytotoxic activit, J. Serb. Chem. Soc. 2019; 841–13

Antonijevic Nikolic M, Antic Stankovic J, Tanaskovic S: Synthesis, characterization and *in vitro* antiproliferative and antibacterial studies of tetraazamacrocyclic complexes of Co(II) and Cu(II) with pyromellitic acid, J Coord Chem, 2018, 71(10): 1542-59

Perovic S, Veinovic G, Antic Stankovic J: A review on antibiotic resistance: origin and mechanisms of bacterial resistance as biological phenomenon, Genetika. 2018, 50(3): 1123-35

Milovic S , Kundakovic TD, Macic V, Antic-Stankovic J, Grozdanic N, Djuricic I, Stankovic I, Anti α-glucosidase, antitumour, antioxidative, antimicrobial activity, nutritive and health protective potential of some seaweeds from the Adriatic coast of Montenegro, Farmacia. 2017, 65 (5): 731-740

Damjanović Ana, Kalinić Marko, Tasić Gordana, Erić Slavica, Antić Stanković Jelena, Savić Vladimir: Synthesis, cytotoxicity and computational study of novel protoberberine derivatives, Journal of the Serbian Chemical Society,2016, 81 (2): 103–123

Matej S, Žižak Ž, Antić Stanković J, Prijatelj M, Turk S, Juranić Z, Mlinarić Rašćan I, Gobec S: Cinnamic Acid Derivates Induce Cell Cycle Arrest in Carcinoma Cell Lines, Medicinal chemistry, 2013, vol 9 (5), 633-641

Erić Slavica, Ke Song, Barata Teresa, Solmajer Tom, Antić Stanković Jelena, Juranić Zorica, Savić Vladimir, Zloh Mire: Target fishing and docking studies of the novel derivates of aryl-aminopyridines with potential anticancer activity, Biorganic & medical chemistry, 2012, vol 20 (17), 5220-5228

Stanić Vojislav, Dimitrijević Suzana, Antić-Stanković Jelena, Mitrić Miodrag, Jokić Bojan, Plećaš Ilija, Raičević Slavica: Synthesis, characterization and antimicrobial activity of copper and zinc-doped hydroxyapatite nanopowders, Applied surface science, 2010, 256 (20), 6083-6089

Mirjana Antonijević-Nikolić, Jelena Antić-Stanković, Branka Dražić, Sladjana Tanasković, New macrocyclic Cu(II) complex with bridge terephthalate: synthesis, spectral properties, in vitro cytotoxic and antimicrobial activity. Comparison with related complexes, J Mole Struct. 2018, ISSN 0022-2860, https://doi.org/10.1016/j.molstruc.2018.10.027

Cirkovic I, Bozic DD, Draganic V, Lozo J, Beric T, Kojic M, Arsic B, Garalejic E, Djukic S, Stankovic S. Licheniocin 50.2 and Bacteriocins from *Lactococcus lactis* subsp. *lactis* biovar. *diacetylactis* BGBU1-4 inhibit biofilms of coagulase negative Staphylococci and *Listeria monocytogenes* clinical isolates. PLoS One. 2016; 11(12):e0167995. doi: 10.1371/journal.pone.0167995.

Samardžić S, Arsenijević J, Božić D, Milenković M, Tešević V, Maksimović Z. Antioxidant, anti-inflammatory and gastroprotective activity of *Filipendula ulmaria* (L.) Maxim. and *Filipendula vulgaris* Moench. Journal of Ethnopharmacology 2018;213:132-137. DOI 10.1016/j.jep.2017.11.013

Cirkovic I, Pavlovic B, Bozic DD, Jotic A, Bakic Lj, Milovanovic J. Antibiofilm effects of topical corticosteroids and intranasal saline in patients with chronic rhinosinusitis with nasal polyps depend on bacterial species and their biofilm-forming capacity. Eur Arch Otorhinolaryngol 2017 274:1897–1903. DOI 10.1007/s00405-017-4454-6

Cirkovic I, Jocic D, Bozic DD, Djukic S, Konstantinovic N, Radak Dj. The Effect of Vacuum-Assisted Closure Therapy on Methicillin-Resistant *Staphylococcus aureus* Wound Biofilms. ADV SKIN WOUND CARE 2018; 31(8):361-364.

Usjak D, Ivkovic B, Bozic DD, Boslovic L, Milenkovic M. Antimicrobial activity of novel chalcones and modulation of virulence factors in hospital strains of *Acinetobacter baumannii* and *Pseudomonas aeruginosa*. Microbial Pathogenesis 2019; 131:186-196.

Božić DD, Milenković MT, Ivković BM, Larsen AR, Ćirković IB. Inhibitory effect of newly-synthesized chalcones on hemolytic activity of methicillin-resistant *Staphylococcus aureus*. Polish Journal of Microbiology 2015; 64 (4): 379-382.

Miljkovic M, Jovanovic S, O'Connor PM, Mirkovic N, Jovcic B, Filipic B, Dinic M, Studholme DJ, Fira D, Cotter PD, Kojic M. *Brevibacillus laterosporus* strains BGSP7, BGSP9 and BGSP11 isolated from silage produce broad spectrum multi-antimicrobials. PLoS One. 2019 May 10;14(5):e0216773. doi: 10.1371/journal.pone.0216773. PMID: 31075157; PMCID: PMC6510442.

Lukić J, Strahinić I, Jovčić B, Filipić B, Topisirović L, Kojić M, Begović J. Different roles for lactococcal aggregation factor and mucin binding protein in adhesion to gastrointestinal mucosa. Appl Environ Microbiol. 2012 Nov;78(22):7993-8000.


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. VLADIMIR SAVIĆ

## O R G A N I C  C H E M I S T R Y

| | |
|---|---|
| Research topic title: | Novel synthetic methodologies and their application in synthesis of natural and biological active products |
| RG members: | Dr. Vladimir Savić, Full Professor<br>Dr. Milena Simić, Associate Professor<br>Dr. Miloš Petković, Associate Professor<br>Dr. Gordana Tasić, Assistant Professor<br>Dr. Miloš Jovanović, Teaching Assistant<br>Dr. Predrag Jovanović, Assistant Professor<br>Dr. Zorana Tokić Vujošević, Associate Professor<br>Mr. Pharm. Mladen Koravović |
| Equipment and methods: | Bruker Avance 400 (400 MHz NMR)<br>Synthetic organic chemistry |
| Projects/funding: | Design and synthesis of Hsp90 PROTAC degraders as potential anticancer agents (StJude)<br>Next generation DNA encoded libraries platform (Totient) |
| Collaborations: | St Jude Children Research Hospital, Memphis, USA<br>Totient, Beograd |
| Selected publications | Cyclative Cascades of Allenamides Derived from Amino Acids: Synthesis of Annulated Indoxyl Derivatives; Milos Petkovic, Veselin Nasufovic, Dimitrije Djukanovic, Zorana Tokic Vujosevic, Milka Jadranin, Radomir Matovic, Vladimir Savic; Eur. J. Org. Chem. 2016, 1279–1282<br>Stereocontrolled Synthesis of Highly Substituted trans α,β-Unsaturated Ketones with Potent Anticancer Properties from Glycals; Predrag Jovanovic, Milos Petkovic, Milena Simic, Milos Jovanovic, Gordana Tasic, Marija Djordjic Crnogorac, Zeljko Zizak, Vladimir Savic; Eur. J. Org. Chem. 2019, 4701–4709<br>Proline Derived Bicyclic Derivatives through Metal Catalysed Cyclisations of Allenes: Synthesis of Longamide B, Stylisine D and their Derivatives; Milos Jovanovic,Milos Petkovic, Predrag Jovanovic, Milena Simic, Gordana Tasic, Slavica Eric,Vladimir Savic; Eur. J. Org. Chem. 2020, 295–305 |

*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. BILJANA SPREMO-POTPAREVIĆ

## P A T H O B I O L O G Y

| | |
|---|---|
| Research topic title: | Evaluation of DNA damage and parameters of oxidative stress in modify physiological response and pathological conditions |
| RG members: | Dr. Biljana Spremo-Potparević, Full Professor<br>Dr. Lada Živković, Associate Professor<br>Dr. Dijana Topalović, Assistant Professor<br>Marija Bruić, Research Assistant |
| Equipment and methods: | Laboratory for work with cell cultures and apparatus for comet test (horizontal electrophoresis).<br>Comet test method for monitoring DNA damage and assessing the efficiency of damage repair, in different cell types. |
| Projects/ funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161. |
| Collaborations: | Fakultet Veterinarske Medicine UB;<br>Institut za Medicinska Istraživaja UB;<br>Institut za Nuklearne Nauke „Vinča“;<br>INEP-Zemun;<br>Univ. PM, Ancona, Italy;<br>King Abdullah University of Science and Technology, SA;<br>UTSA-Dept. of Biology, Texas, USA |

# RESEARCH GROUP
# PROF. BILJANA SPREMO-POTPAREVIĆ

## Selected publications

Antigenotoxic and antioxidant potential of medicinal mushrooms (Immune Assist) against DNA damage induced by free radicals-an *in vitro* study.
Živković L, Bajić V, Bruić M, Borozan S, Popić K, Topalović D, Santibanez J, Spremo-Potparević B. Mutat Res. 2019 Sep;845:403078. doi: 10.1016/j.mrgentox.2019.06.008. Epub 2019 Aug 1.

Dry olive leaf extract attenuates DNA damage induced by estradiol and diethylstilbestrol in human peripheral blood cells *in vitro*.
Topalović D, Dekanski D, Spremo-Potparević B, Pirković A, Borozan S, Bajić V, Stojanović D, Giampieri F, Gasparrini M, Živković L. Mutat Res. 2019 Sep;845:402993. doi: 10.1016/j.mrgentox.2018.12.001. Epub 2018 Dec 21.

The X Files: "The Mystery of X Chromosome Instability in Alzheimer's Disease".
Bajic VP, Essack M, Zivkovic L, Stewart A, Zafirovic S, Bajic VB, Gojobori T, Isenovic E, Spremo-Potparevic B. Front Genet. 2020 Jan 28;10:1368. doi: 10.3389/fgene.2019.01368. eCollection 2019. PMID: 32047510 Free PMC article. Review.

Review: cell cycle aberrations and neurodegeneration.
Bonda DJ, Bajić VP, Spremo-Potparevic B, Casadesus G, Zhu X, Smith MA, Lee HG. Neuropathol Appl Neurobiol. 2010 Apr;36(2):157-63. doi: 10.1111/j.1365-2990.2010.01064.x. Epub 2010 Jan

Surface-modified TiO2 nanoparticles with ascorbic acid: Antioxidant properties and efficiency against DNA damage in vitro.
Bajić V, Spremo-Potparević B, Živković L, Čabarkapa A, Kotur-Stevuljević J, Isenović E, Sredojević D, Vukoje I, Lazić V, Ahrenkiel SP, Nedeljković JM.Colloids Surf B Biointerfaces. 2017 Jul 1;155:323-331. doi: 10.1016/j.colsurfb.2017.04.032. Epub 2017 Apr 14.PMID: 28448902

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*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. GORDANA LEPOSAVIĆ

## P A T H O B I O L O G Y

| | |
|---|---|
| Research topic title: | Immune system plasticity during aging: Immunomodulatory capacity of oestrogens |
| RG members: | Dr. Gordana Leposavić, Full Professor<br>Dr. Nevena Arsenović-Ranin, Full Professor<br>Dr. Zorica Stojić-Vukanić, Full Professor<br>Dr. Biljana Bufan, Associate Professor<br>Dr. Mirjana Nacka-Aleksić, Assistant Professor<br>Dr. Med. Jasmina Đuretić, Teaching Associate<br>Dr. Med. Marija Stojanović, Teaching Associate |
| Equipment and methods: | Real-time PCR for sensitive, specific detection and quantification of nucleic acid targets in cells and tissues of animal and human origin.<br>Flow cytometer for immunophenotyping and cell enumeration, analysis of cell viability, cell cycle and functional assays.<br>CO2 incubator and safety cabinet for work with cell and tissue cultures.<br>Microplate reader for immunoassays (ELISA). |
| Projects/ funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161. |
| Collaborations: | Within Serbian science and diaspora collaboration program, collaboration with the Nerodegenerative Diseases Institute, University of Bordeaux, France |

# RESEARCH GROUP
# PROF. GORDANA LEPOSAVIĆ

Selected publications


Pilipović I, Stojić-Vukanić Z, Prijić I, Jasnić N, Leposavić Gordana. Propranolol diminished severity of rat EAE by enhancing immunoregulatory/protective properties of spinal cord microglia. Neurobiology of Disease 2020, 134: 104665. https://doi.org/10.1016/j.nbd.2019.104665

Dimitrijević M, Arsenović-Ranin N, Kosec D, Bufan B, Nacka-Aleksić M, Pilipović I, Leposavić G. Sexual dimorphism in Th17/Treg axis in lymph nodes draining inflamed joints in rats with collagen-induced arthritis. Brain Behavior and Immunity 2019, 76:198-214. doi: 10.1016/j.bbi.2018.11.311

Nacka-Aleksić M, Stojanović M, Pilipović I, Stojić-Vukanić Z, Kosec D, Leposavić G. Strain differences in thymic atrophy in rats immunized for EAE correlate with the clinical outcome of immunization. PLoS ONE 2018, 13(8): e0201848. doi: 10.1371/journal.pone.0201848

Stojić-Vukanić Z, Kotur-Stevuljević J, Nacka-Aleksić M, Kosec D, Vujnović I, Pilipović I, Dimitrijević M, Leposavić G. Sex Bias in Pathogenesis of Autoimmune Neuroinflammation: Relevance for Dimethyl Fumarate Immunomodulatory/Anti-oxidant Action. Molecular Neurobiology 2018, 55(5):3755-3774. doi: 10.1007/s12035-017-0595-2.

Živković I, Bufan B, Petrušić V, Minić R, Arsenović-Ranin N, Petrović R, Leposavić G. Sexual diergism in antibody response to whole virus trivalent inactivated influenza vaccine in outbred mice. Vaccine 2015, 33(42):5546-5552. doi: 10.1016/j.vaccine.2015.09.006.


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# RESEARCH GROUP
# PROF. DUŠANKA KRAJNOVIĆ

## S O C I A L  P H A R M A C Y

| | |
|---|---|
| Research topic title: | Drug use research in the context of improving pharmaceutical services and patient health outcomes |
| RG members: | Dr. Dušanka Krajnović, Full Professor<br>Dr. Valentina Marinković, Full Professor<br>Dr. Ivana Tadić, Associate Professor<br>Dr. Marina Odalović, Associate Professor<br>Dr. Dragana Lakić, Associate Professor<br>Dr. Andrijana Milošević Georgiev, Teaching Assistant<br>Mr. Pharm. Sofija Šesto, Teaching Assistant<br>Mr. Pharm. Ivana Stević |
| Equipment and methods: | Equipment: Software SPSS ver. 25, TreeAge<br>Methods: qualitative and quantitative researches in pharmaceutical practice (including pharmacoepidemiological, pharmacoeconomic researches, drug use research and many others) |
| Projects/ funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161.<br>Pharmaceutical care service for diabetic patients - development of e-portal and mobile app as supporting concept based on the users' needs/ Innovation Fund Serbia- Assoc. prof Marina Odalović, leading researcher<br>COST CA 19132 „European network to advance best practices & technology on medication adherence“, 2020-2024<br>COST CA 19113 „The European Researchers' Network Working on Second Victims“, 2020-2024 |
| Collaborations: | - International colaboration and cooperation with other academic institutions: (Lithuanian University of Health Sciences in Kaunas - Faculty of Pharmacy, University of Sarajevo - Faculty of Pharmacy, Trinity College Dublin - The School of Pharmacy and Pharmaceutical Sciences, Medical University of Sofia - Faculty of Pharmacy, The Charles University in Prague - Faculty of Pharmacy, University of Medicine and Pharmacy "Carol Davila" Bucharest - Faculty of Pharmacy)<br>- Cooperation with other academic institutions: Faculty of Medicine, University of Novi Sad<br>- Cooperation with other ministries and organizations: Pharmaceutical Chamber of Serbia, Serbian Chamber of Commerce, Ministry of Health, Institute of Public Health of Serbia "Dr Milan Jovanovic Batut", Agency for Accreditation of Health Care Institutions of Serbia |

# RESEARCH GROUP
# PROF. DUŠANKA KRAJNOVIĆ

## Selected publications


Timic J, Kotur-Stevuljevic J, Boeing H, **Krajnovic D,** Djordjevic B, Sobajic S. A cross-sectional survey of salty snack consumption among Serbian urban-living students and their contribution to salt intake. Nutrients 2020; 12, 3290; doi:10.3390/nu12113290

**Krajnović D,** Jocić D. Experience and Attitudes Toward Informed Consent in Pharmacy Practice Research: Do Pharmacists Care? Science and Engineering Ethics. Sci Eng Ethics 2017; Dec;23(6):1529-1539. doi: 10.1007/s11948-016-9853-3. Epub 2016

**Krajnović D,** Ubavić S, Bogavac-Stanojević N. Pharmacotherapy Literacy and Parental Practice in Use of Over-the-Counter Pediatric Medicines. Medicina 2019; 55: 80. doi: 10.3390/medicina55030080

**Krajnović, D**.; Ubavić, S.; Bogavac-Stanojević, N. Pharmacotherapy Literacy of Parents in the Rural and Urban Areas of Serbia—Are There Any Differences? Medicina 2019; 55, 590. doi: 10.3390/medicina55090590

M. Zekovic, M. Djekic-Ivankovic, M. Nikolic, M. Gurinovic, **D. Krajnovic**, and M. Glibetic. Validity of the Food Frequency Questionnaire Assessing the Folate Intake in Women of Reproductive Age Living in a Country without Food Fortification: Application of the Method of Triads. Nutrients 2017; Vol. 9, no. 2, p. 128.

Stojković T, **Marinković V**, Manser T. Using Prospective Risk Analysis Tools to Improve Safety in Pharmacy Settings: A Systematic Review and Critical Appraisal. Journal of Patient Safety 2017, doi: 10.1097/PTS.0000000000000403

Stojković T, **Marinković V,** Jaehde U, Manser T. Using Failure mode and Effects Analysis to reduce patient safety risks related to the dispensing process in the community pharmacy setting, Research in Social & Administrative Pharmacy (2016), doi: 10.1016/j.sapharm.2016.11.009.

Helen M. Lloyd Inger Ekman, Heather L. Rogers, Vítor Raposo, Paulo Melo, **Valentina D. Marinkovic**, Sandra C. Buttigieg, Einav Srulovici , Roman Andrzej Lewandowski and Nicky Britten, Supporting Innovative Person-Centred Care in Financially Constrained Environments: The WE CAREExploratory Health Laboratory Evaluation Strategy, Int. J. Environ. Res. Public Health 2020, 17(9), 3050; https://doi.org/10.3390/ijerph17093050

Fialová D, Laffon B, **Marinković V**, Tasić L, Doro P, Sóos G, Mota J, Dogan S, Brkić J, Teixeira JP, Valdiglesias V. Medication use in older patients and age-blind approach: narrative literature review (insufficient evidence on the efficacy and safety of drugs in older age, frequent use of PIMs and polypharmacy, and underuse of highly beneficial nonpharmacological strategies). European Journal of Clinical Pharmacology,2019:75;451466.

Stojkovic T, Rose O, Woltersdorf R, **Marinkovic V,** Manser T, Jaehde U. Prospective Systemic Risk Analysis of the Dispensing Process in German Community Pharmacies. The International Journal of Health Planning and Management 2017, doi: 10.1002/hpm.2479.

Tripković K, Šantrić Milićević M, **Odalovic M.** Gender Differences In Predictors Of Self-Medication With Tranquillizers And Sleeping Pills: Results Of The Population-Based Study In Serbia. Zdr Varst. 2020;59(1):47-56. DOI: 10.2478/sjph-2020-0007

Ceulemans M, Lupattelli A, Nordeng H, **Odalovic M,** Twigg M, Foulon V. Women's Beliefs about Medicines and Adherence to Pharmacotherapy in Pregnancy: Opportunities for Community Pharmacists? Current Pharmaceutical Design **2019;** doi: 10.2174/1381612825666190321110420

Tripković K, Nešković A, Janković J, **Odalovic M**. Predictors of self-medication in Serbian adult population: cross-sectional study. Int J Clin Pharm 2018; DOI: 10.1007/s11096-018-0624-x

**Odalović M**, Milanković S, Holst L, Nordeng H, Heitmann K, Tasić Lj. Pharmacists counselling of pregnant women: Web-based, comparative study between Serbia and Norway. Midwifery 2016; Sept (40): 79–86.

**Odalović M**, Tadić I, Lakić D, Nordeng H, Lupattelly A, Tasić Lj. Translation and Factor Analysis of Structural Models of the Edinburgh Postnatal Depression Scale in Pregnant and Postpartum Serbian women - Web-based Study. Womens Birth 2015. 28(3):e31-35

**Lakic D,** Stevic I, **Odalovic M,** Vezmar-Kovacevic S, **Tadic I.** Patients' willingness to pay for cognitive pharmacist services in community pharmacies. Croat Med J 2017; 58 (5): 364-71

Kamusheva M, Manova M, Savova AT, Petrova GI, Mitov G, Harsányi A, Kalo Z, Márky K, Kawalec P, Angelovska B, **Lakić D,** Tesar T, Draganic P, Geitona M, Hatzikou M, Paveliu MS, Männik A. Comparative analysis of legislative requirements about patients' access to biotechnological drugs for rare diseases in Central and Eastern European Countries. Frontiers in Pharmacology 2018; 9: 795

Milenković J, **Lakić D.** Analysis of the economic situation of the south east European pharmaceutical industry, J Med Econ 2020; 23(9): 932-9.

Costa FA, Scullin C, Al-Taani G, Hawwa AF, Anderson C, Bezverhni Z, Binakaj Z, Cordina M, Foulon V, Garcia de Bikuña B, de Gier H, Granås AG, Grinstova O, Griese-Mammen N, Grincevicius J, Grinceviciene S, Kaae S, Kubiliene L, Mariño EL, Martins S, Modamio P, Nadin G, Nørgaard LS, Obarcanin E, **Tadic I**, Tasic L, McElnay JC, Hersberger KE, Westerlund T. Provision of pharmaceutical care by community pharmacists across Europe: Is it developing and spreading? J Eval Clin Pract. 2017;23(6):1336-47.

Novak H, **Tadić I**, Falamić S, Ortner Hadžiabdić M. Pharmacists' role, work practices, and safety measures against COVID-19: A comparative study. J Am Pharm Assoc. 2021; 61 (4): 398-407.

Pavlov-Dolijanovic S, Vujasinovic Stupar N, Zugic V, Ostojic P, Zekovic A, Zivanovic Radnic T, Jeremic I, **Tadic I**. Long-term effects of immunosuppressive therapy on lung function in scleroderma patients. Clin Rheumatol. 2018;37(11):3043-50.

**Tadic I,** Vujasinovic Stupar N, Tasic L, Stevanovic D, Dimic A, Stamenkovic B, Stojanovic S, Milenkovic S. Validation of the osteoporosis quality of life questionnaire QUALEFFO-41 for the Serbian population. Health Qual Life Outcomes 2012;10:74.

**Tadic I,** Stevanovic D, Tasic LJ, Vujasinovic-Stupar N. Development of a Short Version of the Osteoporosis Knowledge Assessment Tool. Women Health 2012;52(1):18-31.

**Dragana Lakić**, Ljiljana Tasić, Mitja Kos, Guenka Petrova, Assena Stoimenova**, Dušanka Krajnović**. Pharmacy network and access to medicines in selected eastern European countries: comparative analysis. Croatian Medical Journal 2012; 53: 53-9


*Full bibliography:*
*Faculty of Pharmacy Repository - FarFaR (link)*

# RESEARCH GROUP
# PROF. BILJANA ANTONIJEVIĆ

## T O X I C O L O G Y

| | |
|---|---|
| Research topic title: | Mixture Toxicology – Human Health Risk Assessment |
| RG members: | Dr. Biljana Antonijević, Full Professor<br>Dr. Zorica Bulat, Full Professor<br>Dr. Danijela Đukić-Ćosić, Associate Professor<br>Dr. Marijana Ćurčić, Assistant Professor<br>Dr. Aleksandra Buha Đorđević, Assistant Professor<br>Dr. Evica Antonijević Miljaković, Teaching Assistant<br>Katarina Baralić,<br>Dragana Javorac |
| Equipment and methods: | Atomic absorption spectrophotometer<br>UV-Vis spectrophotometer<br>GC/TCD<br>Microwave Digestion System<br>Derek Nexus software<br>PROAST software<br>@RISK software |
| Projects/funding: | Institutional financing by the Ministry of Education, Science and Technological Development Contract No. 451-03-9/2021-14/200161. |
| Collaborations: | University of Belgrade – Faculty of Medicine;<br>University of Belgrade - Faculty of Dentistry;<br>The Institute of Meat Hygiene and Technology, Belgrade;<br>National Poison Control Centre, MMA;<br><br>Faculty of Food Technology and Biotechnology, University of Zagreb;<br>Faculty of Science, University of Hradec Kralove, Czech Republic;<br>Faculty of Pharmacy, Gazi University, Ankara, Turkey;<br>Toxicology Department, Universidad Miguel Hernendez, Elche, Spain |

# RESEARCH GROUP
# PROF. BILJANA ANTONIJEVIĆ

## Selected publications


Radovanović J, Antonijević B, Kolarević S, Milutinović-Smiljanić S, Mandić J, Vuković-Gačić B, Bulat Z, Ćurčić M, Kračun-Kolarević M, Sunjog K, Kostić-Vuković J. Genotoxicity of Fluoride Subacute Exposure in Rats and Selenium Intervention. Chemosphere 2020, 128978. https://doi.org/10.1016/j.chemosphere.2020.128978

Baralic K, Zivancevic K, Javorac D, Buha Djordjevic A, Anđelkovic M, Jorgovanovic D, Antonijevic , Miljakovic E, Curcic M, Bulat Z, Antonijevic B, Đukic-Cosic D. Multi-strain probiotic ameliorated toxic effects of phthalates and bisphenol A mixture in Wistar rats. Food and Chemical Toxicology 2020; 143: 111540.

Baralić K, Jorgovanović D, Živančević K, Miljaković EA, Antonijević B, Djordjevic AB, Ćurčić M, Đukić-Ćosić D. Safety assessment of drug combinations used in COVID-19 treatment: in silico toxicogenomic data-mining approach. Toxicology and Applied Pharmacology. 2020; 406:115237.

Javorac D, Grahovac L, Manić L, Stojilković N, Anđelković M, Bulat Z, Đukić-Ćosić D, Curcic M, Djordjevic AB. An overview of safety assessment of the medicines currently used in the treatment of COVID-19 disease. Food and Chemical Toxicology. 2020:111639.

David R. Wallace, Yasmeen M. Taalab, Sarah Heinze, Blanka Tariba Lovakovic, Alica Pizent, Elisavet Renieri, Aristidis Tsatsakis, Ammad Ahmad Farooqi, Dragana Javorac, Milena Andjelkovic, Zorica Bulat, Biljana Antonijevic, Aleksandra Buha Djordjevic. Toxic-Metal-Induced Alteration in miRNA Expression Profile as a Proposed Mechanism for Disease Development. Cells 2020; 9, 901; doi:10.3390/cells9040901.

Hernandez AF, Buha A, Constantin C, Wallace DR, Sarigiannis D, Neagu M, Antonijevic B, Hayes AW, Wilks MF, Tsatsakis A. Critical assessment and integration of separate lines of evidence for risk assessment of chemical mixtures. Archives of Toxicology 2019; 93(10): 2741-57.

Andjelkovic M, Buha-Djordjevic A, Antonijevic E, Antonijevic B, Stanic M, Kotur-Stevuljevic J, Spasojevic-Kalimanovska V, Jovanovic M, Boricic N, Wallace D, Bulat Z. Toxic Effect of Acute Cadmium and Lead Exposure in Rat Blood, Liver, and Kidney. International Journal of Environmental Research and Public Health 2019;16(2):274.

Antonijevic E, Musilek K, Kuca K, Djukic-Cosic D, Andjelkovic M, Buha Djordjevic A, Antonijevic B. Comparison of oximes K203 and K027 based on Benchmark dose analysis of rat diaphragmal acetylcholinesterase reactivation. Chemico-Biological Interactions 2019; 308(): 385-91 https://doi.org/10.1016/j.cbi.2019.05.034.

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*Full bibliography:*
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# RESEARCH GROUP ASST. PROF. ALEKSANDRA BUHA ĐORĐEVIĆ

## T O X I C O L O G Y

| | |
|---|---|
| Research topic title: | Endocrine Disrupting Chemicals – Mixture Toxicology |
| RG members: | Dr. Aleksandra Buha Đorđević, Assistant Professor<br>Dr. Zorica Bulat, Full Professor<br>Dr. Danijela Đukić-Ćosić, Associate Professor<br>Dr. Evica Antonijević Miljaković, Teaching Assistant<br>Mr. Pharm.-Med. Biochem. Katarina Baralić, Research Assistant<br>Mr. Pharm. Dragana Javorac, Research Assistant<br>Dr. Stefan Mandić-Rajčević, Teaching Associate (Faculty of Medicine, University of Belgrade)<br>Coworkers through the institutional funding:<br>Đurđica Marić, Research Trainee<br>External coworkers/PhD students:<br>Đurđica Marić, Research Trainee<br>Vera Bonderović, Research Trainee |
| Equipment and methods: | Atomic absorption spectrophotometer<br>UV-Vis spectrophotometer<br>Microwave Digestion System<br>PROAST software<br>@RISK software |
| Projects/funding: | „Decoding the role of exposome in endocrine health“ (Project No 6066532); PROMIS The Science Fund of the Republic of Serbia |
| Collaborations: | University of Belgrade – Faculty of Medicine;<br>Faculty of Veterinary Medicine University of Cambridge, UK;<br>MRC Human Nutrition Research, Elsie Widdowson Laboratory, Cambridge, UK;<br>Kings College London, UK;<br>Oklahoma State University Center for Health Sciences, USA;<br>School of Medicine, University of Crete, Greece;<br>Institute of Forensic and Traffic Medicine, Heidelberg University, Germany;<br>University of Sassari - Faculty of Medicine and Surgery, Italy;<br>Faculty of Health and Social Sciences, Innlandet Hospital & Inland Norway University of Applied Sciences, Norway;<br>Institute for Medical Research and Occupational Health, Croatia;<br>Laboratory for Translational Oncology and Personalized Medicine, RLMC, Lahore, Pakistan |

# RESEARCH GROUP
# ASST. PROF. ALEKSANDRA BUHA ĐORĐEVIĆ

## Selected publications


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