

SANJA BABIĆ BRČIĆ

E-mail: babic@irb.hr

Birth date: Oct 11, 1989

RESEARCH EXPERIENCE

- 2024 – Present **SENIOR RESEARCH ASSOCIATE**
Laboratory for Aquaculture Biotechnology, Division of Materials Chemistry, Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia
- 2018 – 2024 **RESEARCH ASSOCIATE**
Laboratory for Aquaculture Biotechnology, Division of Materials Chemistry, Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia
- 2016 – 2018 **ASSOCIATE AT THE "CENTRE OF EXCELLENCE FOR MARINE BIOPROSPECTING (BIOPROCRO)"**
Laboratory for Aquaculture Biotechnology, Division of Materials Chemistry, Ruđer Boskovic Institute, Bijenička cesta 54, 10000 Zagreb, Croatia
- 2015 – 2016 **ASSOCIATE ON THE PROJECT "PANNONIAN COMPETENCE CENTRE FOR WOOD"**
Laboratory for Aquaculture Biotechnology, Division of Materials Chemistry, Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia
- 2013 – 2014 **VOCATIONAL TRAINING**
Laboratory for Aquaculture Biotechnology, Division of Materials Chemistry, Ruđer Bošković Institute, Bijenička cesta 54, 10000 Zagreb, Croatia

h-index :

13 (WoS)

Personal page:

www.irb.hr/eng/About-RBI/People/Sanja-Babic

ResearchGate:

www.researchgate.net/profile/Sanja-Babic-4

LinkedIn:

www.hr.linkedin.com/in/sanja-babi%C4%87-704369b5

Skills:

- Developmental toxicity
- Behavioral toxicity
- Mutagenicity
- Fluorescence microscopy
- Spectrophotometry
- Bioactivity testing *in vivo* (antioxidative, regenerative, osteogenic, neuroprotective potential)

EDUCATION

- 2016 – 2017 **POSTDOCTORAL RESEARCH**
Biochemistry in Medical Science, Faculty of Health Sciences, University of Ljubljana, Zdravstvena pot 5, 1000 Ljubljana
- 2013 – 2016 **POSTGRADUATE UNIVERSITY STUDY PROGRAMME (PH.D.) IN BIOLOGY**
Faculty of Science, University of Zagreb, Horvatovac 102a, 10000 Zagreb
- 2008 – 2011 **UNDERGRADUATE UNIVERSITY STUDY PROGRAMME IN ENVIRONMENTAL SCIENCES (BCC)**
Department of Biology, Faculty of Science, University of Zagreb, Horvatovac 102a, 10000 Zagreb

PROJECTS

2025/2026	Brown macroalgae from the Adriatic Sea: An Innovative approach for treating hematological malignancies (NPOO.C3.2.R3-I1.05). NPOO, Proof of Innovative Concept - Second Call, 65.918,27 EUR – Principal Investigator
20. 12. 2024- 19. 12. 2027	Neuroprotective potential of phlorotannins from the Adriatic Sea macroalgae on a zebrafish <i>Danio rerio</i> model of Parkinson's disease (IP-2024-05-2216). Croatian Science Foundation (HrZZ), 199.905,50 EUR – Principal Investigator
2024 – 2025	Financial support by the Ruđer Bošković Institute as part of the Call for Applications for the development and upgrade of proposals for national projects (NPOO 2021-2026) (€8,000) – Principal Investigator
2024	Beneficial effects of molecules from Adriatic Sea macroalgae on tissue regeneration in zebrafish (<i>Danio rerio</i>), Croatian Academy of Science and Arts - Principal Investigator
2022	Determination of antioxidant potential of bioactive compounds isolated from Adriatic sea macroalgae: comparison of <i>in vivo</i> , <i>in vitro</i> and <i>in silico</i> approaches, Croatian Academy of Science and Arts - Principal investigator
2020 – 2023	Center of Competence (CEKOM 3LJ) of the Operational Programme Competitiveness and Cohesion (€ 9,780.000) – Team member
2020 – 2023	Development of Innovative Biobased Products by in silico Assesment of Microalgae Bioactivity of the Operational Programme Competitiveness and Cohesion (€ 3,854,000) – Team member
2020 – 2023	SUPERFOOD – Microalgae to Innovative Bakery Products and Pasta of the Operational Programme Competitiveness and Cohesion (€ 1,034,100) – Team member
2020 – 2022	Associate on the research project "Partnerships between scientists and fishermen" - Measure I.3., EU Operational Programme for Maritime Affairs and Fisheries of the Republic of Croatia for the programming period 2014-2020 (€ 395.000) - Partnership between Science and Fisheries (European Maritime and Fisheries Fund, Ministry of Agriculture) – Team member
2020 – 2023	Biomimetic intelligent composite systems, Croatian Science Foundation (€ 190.000) – Team member
2017 – 2023	Bioprospecting of the Adriatic Sea (ERDF fond), European Regional Development Fund, ERDF (€ 5,000.000) – Team member
2018 – 2020	Bilateral Chinese-Croatian scientific project: Development of biological methods for toxicity assessment of nanoparticles in soil – Team member
2014 – 2016	Panonic Wood Center of Competence, European Regional Development Fund (€ 7,000.000) – Team member

TEACHING ACTIVITIES

2014 – Teaching Assistant, Department of Biology, Faculty of Science, University of
2015 Zagreb

INSTITUTIONAL RESPONSIBILITIES

2023 – Member of the Bioethics Committee at Ruđer Bošković Institute
present

2022 – Member of the Bioethics Committee at the Ministry of Agriculture
present

AWARDS AND CERTIFICATES

2023 Ruđer Bošković Institute award for the best article of ZIMO employee for scientific work (Environmental Pollution 292, 118440)

2017 Ruđer Bošković Institute award for the best article of ZKM employee who did not have a doctorate at the time of publication, for scientific work (Journal of Hazardous Materials 318, 477-486)

2017 Annual award of the Society of young scientists and artists for the article published in 2016 (Journal of Hazardous Materials 318, 477-486)

2016 Training course for individuals working with experimental animals, Category B, FELASA equivalent. Certificate number: 179.3-16, HR 191/02/P.

2016 City of Zagreb Scholarship for Ph.D. students

2015 Scholarship given by FEBS and Croatian society for biochemistry and molecular biology for the attendance at the FEBS3+ Meeting – Molecules of life, Slovenia

2012 Special Rector's prize for participation at the event "Night of biology", University of Zagreb

2011 Rector's prize for student work "Range expansion of invasive amphipods and their impact on benthic communities in the Drava River" during the academic year 2011/2012

SUPERVISION OF STUDENTS

2024 Ongoing: J. Požeg Krisković: Ecotoxicity of serotonin reuptake inhibitors citalopram, tramadol, and nortriptyline on zebrafish (*Danio rerio*) embryos. Supervision of graduate thesis

2022 K. Begić: Evaluation of the antioxidant activity of polysaccharides isolated from the Adriatic Sea macroalgae using zebrafish *Danio rerio* embryos (Hamilton, 1822). Supervision of a student work awarded with the Rector's prize

2021 G. Prgić: Ecotoxicological assessment of the impact of cardiovascular pharmaceuticals present in aquatic ecosystems on zebrafish embryos *Danio rerio* (Hamilton, 1822). Supervision of graduate thesis.

2021 K. Begić: Evaluation of the antioxidant activity of polysaccharides isolated from the Adriatic Sea macroalgae using zebrafish *Danio rerio* embryos (Hamilton, 1822). Supervision of a student work awarded with the Rector's prize.

- 2020 – 2021 Mentorship of Klaas Van Halewyck, student of Bioscience Engineering, University of Ghent, Belgium within the ERASMUS+ program
- 2018 A. Sima Cota: Toxicity assessment of the water from Sava River using algae, plants and fish. Supervision of graduate thesis
- 2017 H. Višić: Toxicity of contaminated sediment from the Sava River on zebrafish embryos (*Danio rerio*). Supervision of a student work awarded with the Rector's prize.

PUBLICATIONS (38)

- 2024 Majstorović M, Babić Brčić S, Malev O, Par M, Živković I, Marciuš M, Tarle Z, Čož-Rakovac R, Marović D: Environmental implications of dental restorative materials on the zebrafish *Danio rerio*: Are dental chair drainage systems an emerging environmental threat? *Environmental Toxicology and Pharmacology*, 104499.
- 2024 Buljan A, Stepanić V, Čikoš A, Babić Brčić S, Bojanić K, Roje M: Total Synthesis and Biological Profiling of Putative (±)-Marinoaziridine B and (±)-N-Methyl Marinoaziridine A. *Marine Drugs*, 22(7), 310.
- 2024 Marović D, Bota M, Tarle F, Par M, Hugen HJ, Zheng K, Pavić D, Miloš M, Čižmek L, Babić S, Čož-Rakovac R, Trebše P, Boccaccini AR: The influence of copper-doped mesoporous bioactive nanospheres on the temperature rise during polymerization, polymer cross-linking density, monomer release and embryotoxicity of dental composites. *Dental Materials* 40(7), 1078-1087.
- 2024 Matulja D, Grbčić P, Matijević G, Babić S, Bojanić K, Laclef S, Vrčec V, Čož-Rakovac R, Kraljević Pavelić S, Marković D: Synthesis and biological evaluation of granulatamide B and its structural analogues. *Current Medicinal Chemistry* 31(25)
- 2023 Topić Popović N, Jambrošić MK, Janči T, Babić S, Beer-Ljubić B, Fiket Ž, Bojanić K, Strunjak-Perović I, Tomljanović T, Čož-Rakovac R: Effect of seasonal temperature shifts on body homeostasis, biochemical parameters and chemical composition of green ormer (*Haliotis tuberculata*) in the Northern Adriatic. *Food Chemistry* 421, 136204
- 2023 Martić A, Čižmek L, Ul'yanovskii N, Paradžik T, Perković L, Matijević G, Vujović T, Baković M, Babić S, Kosyakov DS, Trebše P, Čož-Rakovac R: Intra-species variations of bioactive compounds from marine algae: antioxidant, antimicrobial, dermatological, dietary, and neuroprotective potential. *Antioxidants* 12(4), 857
- 2023 Topić Popović N, Čižmek L, Babić S, Strunjak-Perović I, Čož-Rakovac R: Fish liver damage related to the wastewater treatment plant effluents. *Environmental Science and Pollution Research* 30(17), 48739-48768
- 2023 Matijević G¹, Babić S¹, Maršavelski A, Stipaničev D, Repec S, Čož-Rakovac R, Klobučar G: Estimating risk of cardiovascular pharmaceuticals in freshwaters using zebrafish embryotoxicity test-statins threat revealed. *Chemosphere* 313, 137574

- 2022 Topić Popović N, Kazazić S, Bilić B, Babić S, Bojanić K, Bujak M, Tartaro Bujak M, Jadan M, Strunjak-Perović I, Kepec S, Čož-Rakovac R: *Shewanella* spp. from wastewater treatment plant-affected environment: isolation and characterization. *Environmental Science and Pollution Research* 29(55), 82986-83003
- 2022 Radman S, Cikoš AM, Babić S, Čižmek L, Čož-Rakovac R, Jokić S, Jerković I: *In vivo* and *in vitro* antioxidant activity of less polar fractions of *Dasycladus vermicularis* (Scopoli) Krasser 1898 and the chemical composition of fractions and macroalga volatils. *Pharmaceuticals* 15(6), 743
- 2022 Križanac S, Topić Popović N, Barišić J, Beer-Ljubić B, Bujak M, Babić S, Bojanić K, Čož-Rakovac R, Matulić D, Strunjak-Perović I: Comparative study of physiological changes in turbot *Scophthalmus maximus* in different living conditions. *Applied Sciences* 12(9), 4201
- 2022 Radman, S, Čižmek L, Babić S, Cikoš AM, Čož-Rakovac R, Jokić S, Jerković I: Bioprospecting of less-polar fractions of *Ericaria crinita* and *Ericaria amentacea*: Developmental Toxicity and antioxidant activity. *Marine drugs* 20(1), 57
- 2022 Malev O¹, Babić S¹, Cota AS, Stipaničev D, Repec S, Drnić M, Lovrić M, Bojanić K., Radić Brkanac S, Čož-Rakovac R, Klobučar G: Combining short-term bioassays using fish and crustacean model organisms with ToxCast *in vitro* data and broad-spectrum chemical analysis for environmental risk assessment of the river water (Sava, Croatia). *Environmental Pollution* 292, 118440
- 2021 Galić Perečinec M, Babić S, Čižmek L, Selmani A, Topić Popović N, Dutour Sikirić M, Strunjak-Perović I, Čož-Rakovac R. Selenite as a lipid inducer in marine microalga *Dunaliella tertiolecta*: Comparison of one-stage and two-stage cultivation strategies. *Applied Biochemistry and Biotechnology* 1-20
- 2021 Topić Popović N, Gajdoš Kljusurić J, Strunjak-Perović I, Barišić J, Palić D, Beer Ljubić B, Babić S, Čož-Rakovac R. Association of wastewater determinants with fish hematological and plasma biochemical responses: Multivariate analysis approach. *Aquaculture Reports* 21, 100877
- 2021 Radman S, Cikoš AM, Flanjak I, Babić S, Čižmek L, Šubarić D, Čož-Rakovac R, Jokić S, Jerković I. Less polar compounds and targeted antioxidant potential (*in vitro* and *in vivo*) of *Codium adhaerens* C. Agardh 1822. *Pharmaceuticals* 14(9), 944
- 2021 Jerković I, Cikoš AM, Babić S, Čižmek L, Bojanić K, Aladić K, Ul'yanovskii N.V., Kosyakov D.S., Lebedev AT, Čož-Rakovac R, Trebše P, Jokić S. Bioprospecting of less-polar constituents from endemic brown macroalga *Fucus virsoides* J. Agardh from the Adriatic Sea and targeted antioxidant effects *in vitro* and *in vivo* (zebrafish model). *Marine Drugs* 19(5): 235
- 2021 Topić Popović N, Krbavčić M, Barišić J, Beer Ljubić B, Strunjak-Perović I, Babić S, Lorencin V, Matulić D, Tomljanović T, Čož-Rakovac R. Comparative tissue responses of marine mollusks on seasonal changes in the northern Adriatic Sea. *Applied Sciences* 11(6): 2874
- 2021 Babić S, Čižmek L, Maršavelski A, Malev O, Pflieger M, Strunjak-Perović I, Topić Popović N, Čož-Rakovac R, Trebše P. Utilization of the zebrafish model to unravel the harmful effects of biomass burning during Amazonian wildfires. *Scientific Reports* 11: 2527

- 2021 Cikoš AM, Flanjak I, Bojanić K, Babić S, Čižmek L, Čož-Rakovac R, Jokić S, Jerković I. Bioprospecting of Coralline Red Alga *Amphiroa rigida* J.V. Lamouroux: Volatiles, Fatty Acids and Pigments. *Molecules* 26(3): 520
- 2020 Palčić A¹, Babić S¹, Maršavelski A, Galić M, Topić Popović N, Strunjak-Perović I, Čož-Rakovac R, Bronić J, Valtchev V. Nanosized zeolite beta - determining the safety of usage by zebrafish *Danio rerio* embryos. *Microporous and Mesoporous Materials* 299, 110103
- 2020 Topić Popović N, Beer Ljubić B, Strunjak-Perović I, Babić S, Lorencin V, Jadan M, Čižmek L, Matulić D, Bojanić K, Čož-Rakovac R. Seasonal antioxidant and biochemical properties of the Northern Adriatic *Pecten jacobaeus*. *PlosONE* 15(3): e0230539
- 2019 Pečur Kazazić S, Topić Popović N, Strunjak-Perović I, Babić S, Florio D, Fioravanti M, Bojanić K, Čož-Rakovac R: Matrix-assisted laser desorption/ionization time of flight mass spectrometry identification of *Vibrio (Listonella) anguillarum* isolated from sea bass and sea bream. *PLoS ONE* 14(11), e0225343
- 2019 Topić Popović N, Kepec S, Pečur Kazazić S, Barišić J, Strunjak-Perović I, Babić S, Čož-Rakovac: The impact of treated wastewaters on fish bacterial flora: A public health perspective. *Croatian Journal of Fisheries* 77, 132-135
- 2019 Pečur Kazazić S, Topić Popović N, Strunjak-Perović I, Florio D, Fioravanti M, Babić S, Čož-Rakovac R: Fish photobacteriosis-The importance of rapid and accurate identification of *Photobacterium damsela* subsp. *piscicida*. *Journal of Fish Diseases* 42(8), 1201-1209
- 2019 Babić S, Malev O, Pflieger M, Lebedev A.T., Mazur D.M., Kužić A, Čož-Rakovac R, Trebše P: Toxicity evaluation of olive oil mill wastewater and its polar fraction using multiple whole-organism bioassays. *Science of the Total Environment* 686, 903-914
- 2019 Topić Popović N, Kazazić S, Barišić J, Strunjak-Perović I, Babić S, Bujak M, Gajdoš Kljusurić J, Čož-Rakovac R: Aquatic bacterial contamination associated with sugarplant sewage outfalls as a microbial hazard for fish. *Chemosphere* 224, 1-8
- 2018 Babić S, Barišić J, Stipaniev D, Repec S, Lovrić M, Malev O, Martinović-Weigelt, Čož-Rakovac R, Klobučar G: Assessment of river sediment toxicity: Combining empirical zebrafish embryotoxicity testing with *in silico* toxicity characterization. *Science of the Total Environment* 643, 435-450
- 2017 Bielen A, Šimatović A, Kosić-Vukšić J, Senta I, Ahel M, Babić S, Jurina T, González Plaza JJ, Milaković M, Udiković-Kolić N: Negative environmental impacts of antibiotic-contaminated effluents from pharmaceutical industries. *Water Research* 126, 79-87
- 2017 Župan I, Tkalčić S, Čož-Rakovac R, Strunjak-Perović I, Topić Popović N, Babić S, Bujak M, Šarić T: Biochemical parameters in the blood of gilthead sea bream (*Sparus aurata* Linnaeus, 1758) supplemented with commercially available β -glucan-based product (IMUNO-2865®). *Aquaculture Research* 49(2), 786-792
- 2017 Babić S, Barišić J, Višić H, Sauerborn Klobučar R, Topić Popović N, Strunjak-Perović I, Čož-Rakovac R, Klobučar G: Embryotoxic and genotoxic effects of sewage effluents in zebrafish embryo using multiple endpoint testing. *Water Research* 115, 9-21

- 2016 Topić Popović N, Strunjak-Perović I, Barišić J, Kepec S, Jadan M, Beer-Ljubić B, Matijatko V, Palić D, Klobučar G, Babić S, Gajdoš Kljusurić J, Čož-Rakovac R: Native Prussian carp (*Carassius gibelio*) health status, biochemical and histological responses to treated wastewaters. *Environmental Pollution* 218, 689-701
- 2016 Barišić J, Čož-Rakovac R, Delaš I, Topić Popović N, Gavrilović A, Jug-Dujaković J, Brajlo M, Sauerborn-Klobučar R, Babić S, Strunjak-Perović I: Predictive modeling of European flat oyster (*Ostrea edulis* L.) fatty acid composition. *Aquaculture International* 25(2), 805-825
- 2016 Babić S¹, Barišić J¹, Bielen A, Bošnjak I, Sauerborn Klobučar R, Ujević I, Strunjak Perović I, Topić Popović N, Čož-Rakovac R: Multilevel ecotoxicity assessment of environmentally relevant bisphenol A concentrations using the soil invertebrate earthworm *Eisenia fetida*. *Journal of Hazardous Materials* 318, 477-486
- 2016 Babić S, Barišić J, Malev O, Klobučar G, Topić Popović N, Strunjak-Perović I, Krasnići N, Čož-Rakovac R, Sauerborn Klobučar R: Sewage sludge toxicity assessment using earthworm *Eisenia fetida*: can biochemical and histopathological analysis provide fast and accurate insight? *Environmental Science and Pollution Research* 23(12), 12150-12163
- 2015 Babić S, Dragun Z, Sauerborn Klobučar R, Ivanković D, Bačić N, Fiket Ž, Barišić J, Krasnići N, Strunjak-Perović I, Topić Popović N, Čož-Rakovac R: Indication of metal homeostasis disturbance in earthworm *Eisenia fetida* after exposure to semi-solid depot sludge. *Science of the Total Environment* 526, 127-135
- 2015 Topić Popović N, Strunjak-Perović I, Sauerborn Klobučar R, Barišić J, Babić S, Jadan M, Kepec S, Kazazić S, Matijatko V, Beer Ljubić B, Car I, Repec S, Stipaničev D, Klobučar G, Čož-Rakovac R: Impact of treated wastewater effluent on fish and toxicity biosensors. *Science of the Total Environment* 538, 23-37
- 2014 Bošnjak I, Bielen A, Babić S, Šver L, Topić Popović N., Strunjak-Perović I, Čož-Rakovac R, Saurborn Klobučar R: First evidence of the P-glycoprotein gene expression (P-gp/Abcb1) and MXR activity modulation in earthworm *Eisenia fetida*, Savigny. *Archives of Industrial Hygiene and Toxicology* 65(1): 67-74