

Dr. Nikolina Udiković-Kolić

Environmental Microbiology and Biotechnology Lab, Head
Rudjer Bošković Institute; HR-10000 Zagreb, Croatia
Mob.: +385-98-754-288; E-mail: nudikov@irb.hr
Web: <http://www.irb.hr/Ljudi/Nikolina-Udikovic-Kolic>



EMPLOYMENT

2022 to date – Scientific Advisor, Ruđer Bošković Institute (RBI), Zagreb

2017 to date – Head of the Laboratory for Environmental Microbiology and Biotechnology (LEMB), RBI, Zagreb

Previous work positions

2017–2022 Senior Research Associate, RBI, Zagreb

2011–2016 Research Associate, RBI, Zagreb

2012–2013 Fulbright Fellow, Yale University, New Haven, CT, USA. Host: Dr. Jo Handelsman

2008–2011 Senior Research Assistant, RBI, Zagreb

2001–2008 Research Assistant, RBI, Zagreb

EDUCATION

2008 PhD in Biotechnology, Faculty of Food Technology and Biotechnology, University of Zagreb

2001 BSc in Biotechnology, Faculty of Food Technology and Biotechnology, University of Zagreb

AWARDS

2024, 2020, 2019 Annual Awards from the Director of the RBI for publications in journals with high impact factor

2020 Branimir Jernej Foundation Award – Annual Award for a publication in high-impact journal in the field of molecular biology (published in 2019)

2019 Outstanding Associate Editor Award from Journal of Environmental Quality

2008 The BP Young Scientists & Students Award, 13th International Biotechnology Symposium and Exhibition, Dalian, China

2001 Rector's Award of the University of Zagreb for the best undergraduate student paper in the field of biotechnology for academic year 2000/2001

2001 Dean's Award of the Faculty of Food Technology and Biotechnology, University of Zagreb, for the best undergraduate student on the Biotechnology Programme for academic year 2000/2001

GRANTS AND FELLOWSHIPS

2020-2024 Research Grant from the Croatian Science Foundation (CSF). Topic: Resistance to carbapenems and extended spectrum cephalosporins in Croatian wastewater treatment plants;

2022-2023 Bilateral Croatia-Austria project. Topic: Epidemiology of carbapenem-resistant enterobacterial isolates from wastewater. Partner: Dr. Ivan Barisic, Austrian Institute of Technology, Vienna, Austria

2017-2019 Research Grant from the Adris Foundation. Topic: Macrolide resistance in environmental and clinical isolates;

2015-2018 Research Grant from the CSF. Topic: Antibiotic resistance in pharmaceutical wastewaters and receiving environments;

2015-2016 Bilateral Croatia-Germany project. Topic: Biodegradation of antibiotic azithromycin. Partner: Prof. Michael Schlöter, Helmholtz Zentrum München, Germany

- 2016 *Research Grant from the Croatian Academy of Sciences and Arts. Topic: Ecotoxicology of pharmaceutical wastewaters*
- 2015 *Conference Attendance Grant from the Croatian Microbiological Society*
- 2012 *Fulbright Postdoctoral Fellowship for research stay at Yale University, USA (2012-2013)*
- 2003 *Research Fellowship founded by Federation of European Microbiological Societies for a 3-months stay at INRA Institute, Dijon, France*

INVITED LECTURES

- ◆ *"Environmental spread of antibiotic resistance – the role of industrial, agricultural and municipal waste", XII Congress of Microbiologists of Serbia with International Participation, Beograd, Srbija, 2024*
- ◆ *"Antibiotic production waste and the threat of antibiotic resistance", 7th Croatian Congress of Microbiology with International Participation, Sveti Martin na Muri, Croatia, 2022*
- ◆ *"Pharmaceutical waste and antimicrobial resistance", EMBARK Webinar, 2021*
- ◆ *"Antibiotic manufacturing sites - hotspots for the development and dissemination of antibiotic resistance", Central European Symposium on Antimicrobials and Antimicrobial Resistance – CESAR, Sveti Martin na Muri, Croatia, 2018*
- ◆ *"Manure fertilizer increases antibiotic resistance", Power of microbes in industry and environment, Krk, Croatia, 2016.*

MENTORSHIP OF DOCTORAL STUDENTS

- 2024 *Ana Puljko, PhD Thesis: "Wastewater as a source for the spread of resistance to third-generation cephalosporins and carbapenems to the aquatic environment", Faculty of Food Technology and Biotechnology, University of Zagreb*
- 2020 *Milena Milakovic, PhD Thesis: "Impact of pharmaceutical wastewaters on selection and dissemination of antibiotic resistance", Faculty of Science, University of Zagreb*
- 2015 *Tamara Jurina (co-advised with Prof. Ž. Kurtanjek), PhD Thesis: "Modeling of biodegradation and dissipation kinetics of terbuthylazine in soil: comparison with atrazine", Faculty of Food Technology and Biotechnology, University of Zagreb*

SUPERVISION OF UNDERGRADUATE STUDENTS

- 2023 *Ivan Kodela Pacenti, Thesis: "Distribution of genes for resistance to third-generation cephalosporins among municipal wastewater bacteria", Faculty of Science, University of Zagreb*
- 2022 *Petra Gulan, Thesis: "Spread of genes for resistance to cephalosporins of 3. generation between hospital wastewater bacteria", Faculty of Food Technology and Biotechnology, University of Zagreb*
- 2021 *Marija Parać, Thesis: "Resistance to third generation cephalosporins in enterobacteria from wastewater", Faculty of Agronomy, University of Zagreb*
- 2020 *Valentina Žuljević, Thesis: "Resistance to carbapenems and colistin in enterobacteria from wastewaters", Faculty of Agronomy, University of Zagreb*
- 2020 *Lucia Pole, Thesis: "Resistance to macrolide antibiotics: comparison of resistance mechanisms between environmental and clinical bacteria", Faculty of Agronomy, University of Zagreb*

TEACHING ACTIVITIES

- 2013 to 2024 *Postgraduate course "Biotechnology in environmental protection", University of Osijek, Doctoral study in Environment Protection and Nature Conservation*

WORK EXPERIENCE

- ◆ *Published 48 papers in peer-reviewed journals with an h-index of 26 and 3795 citations (Google scholar, as of October 2024) and one book chapter*
- ◆ *Member of the Scientific Field Committee for Natural Sciences, the field of Interdisciplinary Natural Sciences (2024-2028)*
- ◆ *Member of the Management Committee of COST Action ES1403: New and emerging challenges and opportunities in wastewater reuse (NEREUS) (2014-2018)*
- ◆ *Member of the Scientific Committee for (1) the XENOWAC II Conference: Challenges and Solutions related to Xenobiotics and Antimicrobial Resistance in the Framework of Urban Wastewater Reuse, 2018, Cyprus; and (2) the 5th Croatian Congress of Microbiology with International Participation, 2012, Croatia*
- ◆ *Co-instructor of the International Workshops: (1) "Mastering Metagenomics", 2013, Yale University, New Haven, CT, USA, and (2) "Too precious to waste? Challenges & opportunities for wastewater reuse" at the 10th Eastern European YWPs Conference, 2018, Zagreb*
- ◆ *Associate Editor of the Journal of Environmental Quality (2016-2021) and Frontiers in Microbiology (2023 to date)*
- ◆ *Member of Editorial boards of Frontiers in Microbiology and Food Technology and Biotechnology (2015 to date)*
- ◆ *Member of the Evaluation Committee for bilateral research projects at Croatian Ministry of Science and Education (2013 to date)*
- ◆ *Evaluation panel member, Young Researchers' Career Development Programme, CSF (2018)*
- ◆ *Evaluation panel member for research projects, Croatian Science Foundation (2022)*
- ◆ *Evaluation panel member for Preludium research projects, Polish Science Foundation (2023, 2024)*
- ◆ *Reviewer for projects submitted to the Natural Environment Research Council, United Kingdom, and the Israel Science Foundation*
- ◆ *Member of the Croatian Microbiological Society, Federation of European Microbiological Societies, International Union of Microbiological Societies (2002 to date)*
- ◆ *Referee for papers under consideration for publication in FEMS Microbiology Ecology, Environmental Science and Pollution, Environment International, Water Research, Frontiers in Microbiology, Science of the Total Environment, Biodegradation, Journal of Hazardous Materials, International Biodeterioration and Biodegradation, Plos One, Food Technology and Biotechnology.*

SELECTED RECENT PUBLICATIONS

1. *Puljko, Ana; Barišić, Ivan; Dekić Rozman, Svjetlana; Križanović, Stela; Babić, Ivana; Jelić, Marko; Maravić, Ana; **Udiković Kolić, Nikolina** (2024) Molecular epidemiology and mechanisms of carbapenem and colistin resistance in *Klebsiella* and other Enterobacterales from treated wastewater in Croatia, *Environment international*, 185, 108554, 12.*
2. *Shintani, Masaki; Vestergaard, Gisle; Milakovic, Milena; Kublik, Susanne; Smalla, Kornelia; Schloter, Michael; **Udiković-Kolić, Nikolina** (2023) Integrons, transposons and IS elements promote diversification of multidrug resistance plasmids and adaptation of their hosts to antibiotic pollutants from pharmaceutical companies, *Environmental microbiology*, 25, 12; 3035-3051.*
3. *Puljko, Ana ; Dekić Rozman, Svjetlana ; Barišić, Ivan ; Maravić, Ana ; Jelić, Marko ; Babić, Ivana ; Milaković, Milena ; Sviličić Petrić, Ines ; **Udiković-Kolić, Nikolina** (2023) Resistance to critically important antibiotics in hospital wastewater from the largest Croatian city, *Science of the total environment*, 870, 161805, 13.*
4. *Puljko, Ana ; Milaković, Milena ; Križanović, Stela ; Kosić-Vukšić, Josipa ; Babić, Ivana ; Petrić, Ines ; Maravić, Ana ; Jelić, Marko ; **Udiković-Kolić, Nikolina** (2022) Prevalence of enteric*

opportunistic pathogens and extended-spectrum cephalosporin- and carbapenem-resistant coliforms and genes in wastewater from municipal wastewater treatment plants in Croatia, Journal of hazardous materials, 427, 128155, 11.

5. Milaković, M., Križanović, S., Petrić, I., Šimatović, A., Gonzalez-Plaza, J. J., Gužvinec, M., Tambić Andrašević, A., Pole, L., Mrkonjić Fuka, M., **Udiković-Kolić, N.** (2020) Characterization of macrolide resistance in bacteria isolated from macrolide-polluted and unpolluted river sediments and clinical sources in Croatia, *Sci. Tot. Env.* 749, 142357.
6. Milaković, M., Vestergaard, G., González-Plaza, J.J., Petrić, I., Kosić-Vukšić, J., Senta, I., Kublik, S., Schloter, M., **Udiković-Kolić, N.** (2020) Effects of industrial effluents containing moderate levels of antibiotic mixtures on the abundance of antibiotic resistance genes and bacterial community composition in exposed creek sediments, *Sci. Tot. Env.* 706, 136001.
7. Bengtsson-Palme, J., Milaković, M., Švecová, H., Ganjto, M., Jonsson, V., Grabic, R., **Udiković-Kolić, N.** (2019) Industrial wastewater treatment plant enriches antibiotic resistance genes and alters the structure of microbial communities, *Wat. Res.* 162, 437-445.
8. González-Plaza, J.J., Blau, K., Milaković, M., Jurina, T., Smalla, K., **Udiković-Kolić, N.** (2019) Antibiotic-manufacturing sites are hot-spots for the release and spread of antibiotic resistance genes and mobile genetic elements in receiving aquatic environments. *Env. Int.* 130, 104735.
9. Milaković, M., Vestergaard, G., González-Plaza, J.J., Petrić, I., Šimatović, A., Senta, I., Kublik, S., Schloter, M., Smalla, K., **Udiković-Kolić, N.** (2019) Pollution from azithromycin-manufacturing promotes macrolide-resistance gene propagation and induces spatial and seasonal bacterial community shifts in receiving river sediments. *Env. Int.* 123: 501-511