# Nikolina Udiković Kolić, PhD

Scientific Adviser (Senior Scientist) | Head, Laboratory for Environmental Microbiology and Biotechnology
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## RESEARCH PROFILE

Environmental microbiologist working on the emergence and spread of antimicrobial resistance (AMR) in the environment within a One Health framework. Main research lines: AMR in municipal, hospital and pharmaceutical wastewaters; karst groundwater as a reservoir and transmission route of clinically relevant antibiotic-resistant bacteria; AMR in manure-amended agricultural soils; environment–clinic transmission of resistance (genomic epidemiology, plasmids, bacterial hosts of resistance genes); and biodegradation of organic pollutants and its effects on soil and aquatic microbial communities. Methods include culture-based approaches, qPCR/HT-qPCR, 16S rRNA amplicon sequencing, functional metagenomics, whole-genome sequencing analysis and exogenous plasmid isolation.

- **55 (+1)** papers in Web of Science Core Collection journals, **39 (+1)** in Q1 journals; first or corresponding author on **23** papers
- Citations: **3,984** (Web of Science), **4,458** (Scopus), **5,896** (Google Scholar); h-index **26** (WoS, Scopus), **29** (Google Scholar) – as of October 2026

## EDUCATION

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| 2008 | PhD in Biotechnical Sciences (Molecular Biotechnology), Faculty of Food Technology and Biotechnology, University of Zagreb |
| 2001 | Dipl. Ing. Biotechnology (four-year pre-Bologna university degree, equivalent to MSc), Faculty of Food Technology and Biotechnology, University of Zagreb |

## POSITIONS

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| 2021 – present | Scientific Adviser (Senior Scientist), Ruđer Bošković Institute (RBI), Zagreb |
| 2018 – present | Head of the Laboratory for Environmental Microbiology and Biotechnology, RBI (established in 2018; permanent laboratory since 2021) |
| 2016 – 2021 | Senior Research Associate, RBI |
| 2011 – 2016 | Research Associate, RBI |
| 2012 – 2013 | Fulbright Visiting Scholar, Department of Molecular, Cellular and Developmental Biology, Yale University, USA (host: Prof. Jo Handelsman) |
| 2008 – 2011 | Postdoctoral Researcher, RBI |
| 2002 – 2008 | Research Assistant (PhD student), RBI (short research visits to INRA, Dijon, France, 2003–2007, including a 3-month FEMS fellowship) |

## RESEARCH GRANTS (PRINCIPAL INVESTIGATOR)

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| 2024 – 2027 | ARES – Antimicrobial resistance surveillance via analyses of groundwaters, Croatian Science Foundation (CSF) |
| 2022 – 2023 | Carbapenemase- and ESBL-producing, colistin-resistant Enterobacterales in municipal wastewaters, Croatian–Austrian bilateral project (partner: Dr. Ivan Barišić, Austrian Institute of Technology, Vienna) |
| 2020 – 2024 | WasteCare – Antibiotic resistance in wastewater treatment plants in Croatia: focus on extended-spectrum β-lactamases and carbapenemases, CSF |
| 2017 – 2019 | Linking environmental antibiotic pollution and resistance in human pathogens, Adris Foundation |
| 2015 – 2018 | WINAR – Impact of pharmaceutical wastewaters on antibiotic resistance in freshwater sediments, CSF, Installation Research Project |
| 2015 – 2016 | Biodegradation of azithromycin and its effects on wastewater microbial communities, Croatian–German bilateral project (partner: Prof. Michael Schloter, Helmholtz Zentrum München) |

## SUPERVISION AND TEACHING

- PhD theses: 3 completed (2015, 2020, 2024), 2 ongoing
- Postdoctoral researchers: 7 supervised; MSc theses: 6 (incl. Lund University, Sweden, 2026)
- Course leader: *Biotechnology in Environmental Protection*, PhD programme Nature and Environmental Protection, Josip Juraj Strossmayer University of Osijek (2013–2024)

- Lecturer: *Bioremediation and Biological Wastewater Treatment Processes*, PhD programme Biotechnology and Bioprocess Engineering, Food Technology and Nutrition, Faculty of Food Technology and Biotechnology, University of Zagreb (2016/2017)

## EDITORIAL AND ADVISORY ROLES

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| 2025 – 2028 | Associate Editor, *mSystems* (ASM) |
| 2023 – present | Associate Editor, *Frontiers in Microbiology* (Editorial Board member 2015–2023) |
| 2016 – 2021 | Associate Editor, *Journal of Environmental Quality* |
| 2015 – present | Editorial Board member, *Food Technology and Biotechnology* |
| 2024 – 2028 | Member, National Field Committee for Interdisciplinary Natural Sciences (Croatian National Council for Higher Education, Science and Technological Development) |
| 2024 – 2028 | External Advisory Board member, MSCA Doctoral Network Pharm-ERA |
| 2014 – 2018 | Management Committee member, COST Action ES1403 NEREUS (wastewater reuse) |
| 2019 – 2025 | Grant reviewer: NERC (UK), Wellcome Trust (UK), Israel Science Foundation, National Science Centre (Poland); Croatian Science Foundation panel member (2022) |
| 2020 – 2025 | External PhD examiner: Tuscia University (Italy), Maynooth University (Ireland), University of Bergen (Norway), Lithuanian University of Health Sciences |
| 2012 – 2025 | Scientific committees: CESAR 2025 (Zadar, Croatia, 2025), XII Congress of Microbiologists of Serbia with International Participation (Belgrade, Serbia, 2024), XENOWAC II (Limassol, Cyprus, 2018), 5th Croatian Congress of Microbiology with International Participation (Primošten, Croatia, 2012) |

## SELECTED INVITED LECTURES

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| 2025 | Summer Doctoral School “Safe Environment: Our Future”, University of Warmia and Mazury, Olsztyn, Poland |
| 2024 | XII Congress of Microbiologists of Serbia with International Participation, Belgrade, Serbia |
| 2022 | 7th Croatian Congress of Microbiology with International Participation, Sveti Martin na Muri, Croatia |
| 2021 | EMBARK Fall Webinars (JPIAMR project EMBARK), online |
| 2018 | Central European Symposium on Antimicrobials and Antimicrobial Resistance (CESAR 2018), Sveti Martin na Muri, Croatia |

## AWARDS AND FELLOWSHIPS

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| 2019 – 2025 | RBI Director’s Awards for papers in high-impact journals (8 papers) |
| 2020 | Branimir Jernej Foundation Award for a valuable scientific paper |
| 2019 | Outstanding Associate Editor Award, *Journal of Environmental Quality* |
| 2012 | Fulbright Postdoctoral Fellowship (9 months), Yale University, USA; extended by 2 months with Yale University funding |
| 2008 | BP Young Scientists Award, 13th International Biotechnology Symposium, Dalian, China |
| 2003 | FEMS Research Fellowship (3 months), INRA Dijon, France |

## SELECTED PUBLICATIONS

1. Puljko A.†, Weisse L.†, Ujević Bošnjak M., Štiglić J., Maravić A., **Udiković-Kolić N.*** (2026) Microbial community structure and antibiotic resistance genes in Dinaric karst groundwater under contrasting hydrological conditions. *Journal of Hazardous Materials* 517, 143725.
2. Puljko A., Barišić I., Dekić Rozman S., Križanović S., Babić I., Jelić M., Maravić A., **Udiković-Kolić N.*** (2024) Molecular epidemiology and mechanisms of carbapenem and colistin resistance in *Klebsiella* and other Enterobacterales from treated wastewater in Croatia. *Environment International* 185, 108554.
3. Puljko A.†, Babić I.†, Dekić Rozman S., Barišić I., Jelić M., Maravić A., Parać M., Sviličić Petrić I., **Udiković-Kolić N.*** (2024) Treated municipal wastewater as a source of high-risk and emerging multidrug-resistant clones of *E. coli* and other Enterobacterales producing extended-spectrum β-lactamases. *Environmental Research* 243, 117792.
4. Dekić Rozman S., Puljko A., Karkman A., Virta M., **Udiković-Kolić N.*** (2024) Bacterial hosts of clinically significant beta-lactamase genes in Croatian wastewaters. *FEMS Microbiology Ecology* 100, fiae081.
5. Puljko A., Milaković M., Križanović S., Kosić-Vukšić J., Babić I., Petrić I., Maravić A., Jelić M., **Udiković-Kolić N.*** (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.

6. 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. *Water Research* 162, 437–445.
7. 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. *Environment International* 130, 104735.
8. 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. *Environment International* 123, 501–511.
9. Bielen A., Šimatović A., Kosić-Vukšić J., Senta I., Ahel M., Babić S., Jurina T., González-Plaza J.J., Milaković M., **Udiković-Kolić N.*** (2017) Negative environmental impacts of antibiotic-contaminated effluents from pharmaceutical industries. *Water Research* 126, 79–87.
10. **Udiković-Kolić N.†**, Wichmann F.†, Broderick N.A., Handelsman J. (2014) Bloom of resident antibiotic-resistant bacteria in soil following manure fertilization. *Proceedings of the National Academy of Sciences USA* 111, 15202–15207.

** corresponding author; † equal contribution*