

Curriculum Vitae

PERSONAL INFORMATION

Name: Ivan Senta

Date of birth: 11/12/1979

Nationality: Croatian

URL for web site: <https://www.irb.hr/eng/People/Ivan-Senta>

EDUCATION

2004-2009 – PhD in Analytical Chemistry, Faculty of Science, University of Zagreb, Croatia

1998-2003 – Dipl. ing. in Chemistry (equivalent of Master Degree in Chemistry), Faculty of Science, University of Zagreb, Croatia

CURRENT POSITION

01/02/2019-present – Senior Research Associate, Laboratory for Analytical Chemistry and Biogeochemistry of Organic Compounds, Division for Marine and Environmental Research, Rudjer Boskovic Institute, Zagreb, Croatia

PREVIOUS POSITIONS

11/09/2013 - 31/01/2019 – Research Associate, Rudjer Boskovic Institute, Zagreb

12/03/2013 - 10/09/2013 – Senior Research Assistant, Rudjer Boskovic Institute, Zagreb

15/03/2012 - 11/03/2013 – Postdoctoral Researcher, Mario Negri Institute for Pharmacological Research, Milan, Italy

24/03/2009 - 14/03/2012 – Senior Research Assistant, Rudjer Boskovic Institute, Zagreb

03/05/2004 - 23/03/2009 – Research Assistant, Rudjer Boskovic Institute, Zagreb

PARTICIPATION IN RESEARCH PROJECTS

2016-2017 – Croatian-Slovenian bilateral project *Assessment of emerging contaminants in the Sava River*

2015-2019 – *Comprehensive assessment of the environmental behaviour and fate of pharmaceutically active contaminants: macrolide antibiotics and opioid analgesics* funded by the Croatian Science Foundation

2014-2018 – EU COST action ES 1403: *New and emerging challenges and opportunities in wastewater reuse* (NEREUS)

2014-2018 – EU COST action ES1307: *Sewage biomarker analysis for community health assessment* (SCORE)

2012-2015 – EU FP7 People project *Innovative biodiagnosis meets chemical structure elucidation – Novel tools in effect directed analysis to support the identification and monitoring of emerging toxicants on a European scale* (EDA-EMERGE)

2012-2013 – National project *Aqua Drugs* funded by Dipartimento per le Politiche Antidroga della Presidenza del Consiglio dei Ministri (Italy)

2012-2013 – Regional project *Lombardy Network (Rete Lombarda)* funded by the Lombardy Region (Italy)

2012 – *Quantitative analysis of the selected urinary biomarkers in the wastewater of the city of Zagreb* funded by Government of the Republic of Croatia – Office for combating narcotic drug abuse

2012 – *Analysis of the drinking water from the water well Šibice* funded by the City of Zapresic

2008-2009 – *Highly specific determination of illicit drugs in municipal wastewater as a base for the evaluation of trends in drugs abuse in the City of Zagreb* funded by the City of Zagreb

2008 – *Determination of the pollution of the Gorjak Creek sediments* funded by the Croatian Waters

2007-2010 – NATO Science for Peace Programme Project *Assessment of hazardous chemical contamination in the Sava River basin*

2007-2013 – *Organic compounds as a molecular tracers of anthropogenic influence in the environment* funded by the Croatian Ministry of Science

2004-2007 – EU FP6 STREP project *Reduction of environmental risks, posed by emerging contaminants, through advanced treatment of municipal and industrial wastewaters (EMCO)*

2004-2006 – *Analytical chemistry and biogeochemistry of organic compounds in the aquatic environment* funded by the Croatian Ministry of Science (2002-2006)

SHORT RESEARCH STAYS AND SELECTED ADVANCED TRAININGS

- Short-term scientific mission within the framework of the COST action ES1307: *Determination of urinary biomarkers of alcohol and tobacco in wastewater of the City of Split (Croatia) during a music festival and the tourist season*, Institute of Food Analysis and Research, University of Santiago de Compostela (Spain), 25 January - 23 February 2017
- *Assessing human health and lifestyle by sewage epidemiology*, COST action ES1307 Training School, Milan (Italy), 17-18 September 2014
- *Interpretation of MS and MS-MS Mass Spectra*, Ljubljana (Slovenia), 9-10 June 2011
- *Identification of wastewater contaminants using GC-ToF-MS*, advanced training within the NATO Science for Peace Programme Project, Norwegian Institute for Water Research, Oslo (Norway), 22-26 October 2010
- *LC-MS/MS in Quantitative Analysis*, Ljubljana (Slovenia), 26-27 March 2009
- *Fractionation of environmental samples by preparative HPLC for Effects directed analysis*, advanced training within the NATO Science for Peace Programme Project, Norwegian Institute for Water Research, Oslo (Norway), 14-16 October 2008
- *Analytical quality control and method validation in support to the Water Framework Directive*, Budapest (Hungary), 2-4 November 2004

SUPERVISING AND MENTORING ACTIVITIES

- 2017/18. – Co-supervisor of the master student Antun Stegić at University of Zagreb, Faculty of Food Technology and Biotechnology (thesis defended)
- 2018/19. – Supervisor of the master student Ena Jusup at University of Zagreb, Faculty of Science

LANGUAGES

- English (C1)
- Italian (B1)
- Spanish (A1)

PUBLICATIONS

28 papers in peer-reviewed scientific journals, 862 citations (Scopus), *h*-index 17

Publications in peer-reviewed scientific journals

1. M. Milaković, G. Vestergaard, J. González-Plaza, I. Petrić, A. Šimatović, I. Senta, S. Kublik, M. Schloter, K. Smalla, N. Udiković-Kolić, Pollution from azithromycin-manufacturing promotes macrolide-resistance gene propagation and induces spatial and seasonal bacterial community shifts in receiving river sediments, *Environ. Int.* 123 (2019) 501-511
2. I. Krizman-Matasic, **I. Senta**, P. Kostanjevecki, M. Ahel, S. Terzic, Long-term monitoring of drug consumption patterns in a large-sized European city using wastewater-based epidemiology: Comparison of two sampling schemes for the assessment of multiannual trends, *Sci. Total Environ.* 647 (2019) 474-485
3. S. Terzic, N. Udikovic-Kolic, T. Jurina, I. Krizman-Matasic, **I. Senta**, I. Mihaljevic, J. Loncar, T. Smital, M. Ahel, Biotransformation of macrolide antibiotics using enriched activated sludge culture: Kinetics, transformation routes and ecotoxicological evaluation, *J. Hazard. Mater.* 349 (2018) 143-152
4. M. Furdek Turk, **I. Senta**, G. Kniewald, N. Mikac, Determination of organotin compounds (OTC) at low levels in seawater by solid-phase extraction (SPE) and gas chromatography-pulsed flame photometric detection (GC-PFPD), *Int. J. Environ. Anal. Chem.* 98 (2018) 1-15
5. A. Bielen, A. Šimatović, J. Kosić-Vukšić, **I. Senta**, M. Ahel, S. Babić, T. Jurina, J. J. González Plaza, M. Milaković, N. Udiković-Kolić, Negative environmental impacts of antibiotic-contaminated effluents from pharmaceutical industries, *Water Res.* 126 (2017) 79-87
6. A. Causanilles, J. A. Baz-Lomba, D. A. Burgard, E. Emke, I. Gonzalez-Mariño, I. Krizman-Matasic, A. Li, A. S. C. Löve, A. K. McCall, R. Montes, A. L. N. van Nuijs, C. Ort, J. B. Quintana, **I. Senta**, S. Terzic, F. Hernandez, P. de Voogt, L. Bijlsma, Improving wastewater-based epidemiology to estimate cannabis use: focus on the initial aspects of the analytical procedure, *Anal. Chim. Acta* 988 (2017) 27-33
7. E. Zuccato, E. Gracia-Lor, N. I. Rousis, A. Parabiaghi, **I. Senta**, F. Riva, S. Castiglioni, Illicit drug consumption in school populations measured by wastewater analysis, *Drug Alcohol Depen.* 178 (2017) 285-290
8. **I. Senta**, I. Krizman-Matasic, S. Terzic, M. Ahel, Comprehensive determination of macrolide antibiotics, their synthesis intermediates and transformation products in wastewater effluents and ambient waters by liquid chromatography–tandem mass spectrometry, *J. Chromatogr. A* 1509 (2017) 60-68
9. E. Gracia-Lor, S. Castiglioni, R. Bade, F. Been, E. Castrignanó, A. Covaci, I. González-Mariño, E. Hapeshi, B. Kasprzyk-Hordern, J. Kinyua, F. Y. Lai, T. Letzel, L. Lopardo, M. R. Meyer, J.

- O'Brien, P. Ramin, N. I. Rousis, A. Rydevik, Y. Ryu, M. M. Santos, **I. Senta**, N. S. Thomaidis, S. Veloutsou, Z. Yang, E. Zuccato, L. Bijlsma, Measuring biomarkers in wastewater as a new source of epidemiological information: Current state and future perspectives, *Environ. Int.* 99 (2017) 131-150
10. P. Marić, M. Ahel, **I. Senta**, S. Terzić, I. Mikac, A. Žuljević, T. Smital, Effect-directed analysis reveals inhibition of zebrafish uptake transporter Oatp1d1 by caulerpenyne, a major secondary metabolite from the invasive marine alga *Caulerpa taxifolia*, *Chemosphere* 174 (2017) 643-654
11. I. Krizman, **I. Senta**, M. Ahel, S. Terzić, Wastewater-based assessment of regional and temporal consumption patterns of illicit drugs and therapeutic opioids in Croatia, *Sci. Total Environ.* 566-567 (2016) 454-462
12. E. Zuccato, S. Castiglioni, **I. Senta**, A. Borsotti, B. Genetti, A. Andreotti, G. Pieretti, G. Serpelloni, Population surveys compared with wastewater analysis for monitoring illicit drug consumption in Italy in 2010-2014. *Drug Alcohol Depen.* 161 (2016) 178-188
13. **I. Senta**, I. Krizman, M. Ahel, S. Terzić, Multiresidual analysis of emerging amphetamine-like psychoactive substances in wastewater and river water. *J. Chromatogr. A* 1425 (2015) 204-212
14. S. Castiglioni, A. Borsotti, **I. Senta**, E. Zuccato, Wastewater Analysis to Monitor Spatial and Temporal Patterns of Use of Two Synthetic Recreational Drugs, Ketamine and Mephedrone, in Italy, *Environ. Sci. Technol.* 49 (2015) 5563-5570
15. **I. Senta**, E. Gracia-Lor, A. Borsotti, E. Zuccato, S. Castiglioni, Wastewater analysis to monitor use of caffeine and nicotine and evaluation of their metabolites as biomarkers for population size assessment, *Water Res.* 74 (2015) 23-33
16. S. Castiglioni, **I. Senta**, A. Borsotti, E. Davoli, E. Zuccato, A novel approach for monitoring tobacco use in local communities by wastewater analysis, *Tob. Control* 24 (2015) 38-42
17. **I. Senta**, I. Krizman, M. Ahel, S. Terzić, Assessment of stability of drug biomarkers in municipal wastewater as a factor influencing the estimation of drug consumption using sewage epidemiology, *Sci. Total Environ.* 487 (2014) 659-665
18. R. Zaja, S. Terzić, **I. Senta**, J. Lončar, M. Popović, M. Ahel, T. Smital, Identification of P-glycoprotein (P-gp, Abcb1) inhibitors in contaminated freshwater sediments, *Environ. Sci. Technol.* 47 (2013) 4813-4821
19. **I. Senta**, I. Krizman, M. Ahel, S. Terzić, Integrated procedure for multiresidue analysis of dissolved and particulate drugs in municipal wastewater by liquid chromatography–tandem mass spectrometry, *Anal. Bioanal. Chem.* 405 (2013) 3255-3268
20. **I. Senta**, S. Terzić, M. Ahel, Occurrence and fate of dissolved and particulate antimicrobials in municipal wastewater treatment, *Water Res.* 47 (2013) 705-714
21. T. Smital, S. Terzić, J. Lončar, **I. Senta**, R. Zaja, M. Popovic, I. Mikac, K. E. Tollefsen, K. V. Thomas, M. Ahel, Prioritisation of organic contaminants in a river basin using chemical analyses and bioassays, *Environ. Sci. Pollut. Res.* 20 (2013) 1384-1395
22. **I. Senta**, M. Matošić, H. Korajlija Jakopović, S. Terzić, J. Čurko, I. Mijatović, M. Ahel, Removal of antimicrobials using advanced wastewater treatment, *J. Hazard. Mater.* 192 (2011) 319-328

23. S. Terzic, **I. Senta**, M. Matošić, M. Ahel, Identification of biotransformation products of antimicrobials in membrane bioreactor treatment by ultrahigh-performance liquid chromatography/quadrupole time-of-flight mass spectrometry, *Anal. Bioanal. Chem.* 40 (2011) 353-363
24. T. Smital, S. Terzic, R. Zaja, **I. Senta**, B. Pivcevic, M. Popovic, I. Mikac, K. E. Tollefsen, K. V. Thomas, M. Ahel, Assessment of toxicological profiles of the municipal wastewater effluents using chemical analyses and bioassays, *Ecotoxicol. Environ. Saf.* 74 (2011) 844-851
25. V. Bukvic, V. Dusak, M. Kucinic, A. Delic, J. Dulcic, **I. Senta**, B. Glamuzina, Arsenic in the water, sediment and tissues of fish in the Neretva River Delta, Croatia, *J Appl. Ichthyol.* 27 (2011) 908-911
26. S. Terzic, **I. Senta**, M. Ahel, Illicit drugs in wastewaters of the city of Zagreb (Croatia) – Estimation of drug abuse in a transition country, *Environ. Pollut.* 158 (2010) 2686-2693
27. **I. Senta**, S. Terzic, M. Ahel, Simultaneous determination of sulfonamides, fluoroquinolones, macrolides and trimethoprim in wastewater and river water by LC-tandem-MS, *Chromatographia*, 68 (2008) 747-758
28. S. Terzic, **I. Senta**, M. Ahel, M. Gros, M. Petrovic, D. Barcelo, J. Müller, T. Knepper, I. Marti, F. Ventura, P. Jovancic, D. Jabucar, Occurrence and fate of emerging wastewater contaminants in Western Balkan region, *Sci. Total Env.* 399 (2008) 66-77

SELECTED ORAL PRESENTATIONS

- *Importance of metabolites, synthesis intermediates and transformation products of macrolide antibiotics in urban wastewater - a case study at the wastewater treatment plant of the city of Zagreb*, Xenowac II, Limassol (Cyprus), 11 October 2018
- *Analysis of emerging organic contaminants in water and sediment samples*, invited speaker at Workshop on Advanced techniques for the analysis of trace emerging contaminants in environmental samples, Zagreb (Croatia), 23 February 2018
- *Determination of macrolide antibiotics, their intermediates and transformation products in solid environmental matrices*, 16th International Conference on Chemistry and the Environment (ICCE), Oslo (Norway), 21 June 2017
- *Multiclass determination of new psychoactive substances in municipal wastewater*, Pittcon 2016, Atlanta (USA), 8 March 2016

HONOURS

Prizes and Research Awards

- 2019 – Marie Skłodowska-Curie Individual Fellowship in the framework of EU Programme *Horizon 2020*
- 2016 – American Chemical Society grant for participation at *Pittcon 2016*
- 2014, 2015, 2016 – Division for Marine and Environmental Research's annual award for the paper published in high-quality journal
- 2013 – Rudjer Boskovic Institute's annual award for the paper published in high-quality journal

- 2011 – Special award of the Ruđer Bošković Institute's director for the presentation at the scientific meeting of the young RBI scientists

Memberships/committees

- Scientific Committee member of *Xenowac II* conference (Limassol, Cyprus, 10-12 October 2018)
- Local Programme Committee member of *10th Eastern European Young Water Professionals Conference* (Zagreb, Croatia, 7-12 May 2018)
- 2014-2018 – Management Committee member from Croatia to COST action ES1403 (*NEREUS*)
- 2014-2018 – Management Committee substitute from Croatia to COST action ES1307 (*SCORE*)

Reviews

- Science of the Total Environment
- Analytical Chemistry
- Environment International
- Water Research
- Journal of Hazardous Materials
- Environmental Pollution
- Chemosphere
- Drug Testing and Analysis
- Environmental Research
- Environmental Science and Pollution Research
- Current Opinion in Environmental Science & Health
- International Journal of Environmental Analytical Chemistry
- Archives of Industrial Hygiene and Toxicology

Science popularisation

- *Too precious to waste? Challenges & opportunities for reuse*, Joint workshop of the IWA Young Water Professionals & Blue Circle Society of the NEREUS COST Action ES1403, Zagreb, Croatia, 9 May 2018 (lecturer)
- *Wastewater-based epidemiology*, Joint workshop of the Knowledge in Action Foundation and Rudjer Boskovic Institute in the framework of *Stem. Grow. Explore.* programme, Zagreb, Croatia, 12 May 2017 (lecturer)
- *Wastewater as sources of epidemiological information*, Joint workshop of the Knowledge in Action Foundation and Rudjer Boskovic Institute in the framework of *Stem. Grow. Explore.* programme, Zagreb, Croatia, 13 May 2016 (lecturer)
- Participation at Rudjer Boskovic Institute Open days