



Victoria Osorio Torrens

Generated from: Editor CVN de FECYT

Date of document: 12/04/2023

v 1.4.3

81636ce5aac213d28ca4823f7650b3fd

This electronic file (PDF) has embedded CVN technology (CVN-XML). The CVN technology of this file allows you to export and import curricular data from and to any compatible data base. List of adapted databases available at: <http://cvn.fecyt.es/>



Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

I am PhD in Environmental Analytical Chemistry, with a solid background in the study of fate and behavior in the environment of organic contaminants of emerging concern (CECs), such as pharmaceuticals (PhACs) and their transformation products (TPs), and natural compounds such as bioactive metabolites produced by bacteria. I developed several analytical methods relying on cutting-edge instrumental techniques (Solid Phase Extraction and Pressurized Liquid Extraction; Liquid and Gas Chromatography; Mass Spectrometry (MS), High Resolution MS (HRMS) and HRMS Imaging). I am widely expert on chemical structure elucidation of unknown metabolites and TPs, characterization of physic-chemical properties and bioactivity of organic compounds. After Chemistry Degree (2008), I completed two Master (2010) and doctoral theses (2015) conducting research at IDAEA-CSIC as earlystage researcher. Under projects VIECO and SCARCE, I studied the behavior, fate and effects of PhACs and their TPs in waste waters and receiving freshwater systems. With the ITN EDA-EMERGE I joined KWR as MSC-Experienced Researcher (2013). I validated analytical methods based on Effect-Directed Analysis for combined chemical and biological analysis of CECs in European River basins. After a maternity leave, I joined the University of Liège as MSC-COFUND Postdoc Fellow (2016). I studied surfactins metabolized by plant-growth promoting bacteria in the rizosphere zone that can be used in agriculture for crop protection purposes. I identified and elucidated the chemical structure of metabolites of Bacillus bacteria by HRMS and studied their interaction with other bacteria and pathogens by HRMS Imaging. As scientific researcher at BETA Technological Center (2019) I participated in several technology and knowledge transfer projects and other agreements with companies from the water management and agri-food sectors. I was head of the Instrumental Analytical Laboratory performing validation and quality assurance of methods applied to assess chemicals in environmental samples and agri-food residues. In 2020 was accredited as I ecturer in the field of science (AQU) and joined the University of Girona as associate professor in the Analytical Chemistry Area. During the academic course 2020/2022 I taught 5 subjects of Chemistry, Biotechnology and Biology Degrees and a Master program. Also in 2020, I was appointed by the European Economic and Social Committee as scientific expert for the rapporteur of the Opinion on the “Chemicals Strategy for Sustainability” reported by the Section for Agriculture, Rural Development and the Environment (NAT/807) and on the Opinion of the “Zero Pollution Action Plan for air, water and soil” (NAT/830). Between 2021 and 2022 I studied at ICRA the occurrence of antibiotic resistance genes in livestock-related environments in the framework of REST-RESIST project, which I got funded by the MSC-COFUND Postdoc Fellowship Beatriu de Pinós. In 2022 I was awarded with the prestigious Ramón y Cajal grant which I started in 2023 at IDAEA-CSIC. Currently, I am developing my line of research focused on based effect analytical methods, and particularly effect-directed analysis (EDA) approaches, for environmental quality monitoring and risk assessment of the complex mixtures of CECs occurring in the environment. Recently, we have been funded together with a prestigious consortium of different research institutes in Europe with the HORIZON-MSCA-2022-DN-01 "Pharm-ERA" in which I am PI and I will supervise a PhD project focused on the development of an EDA approach for the assessment of PhACs in the aquatic environment. I have published 25 articles in SCI indexed journals



(H index 16), 4 book chapters, 2 scientific technical reports, 1 scientific dissemination video and 1 popular scientific book. I am active reviewer (20 publications and 1 Doctoral thesis) and experienced in dissemination of science topics addressed to a broad range of audience.



General quality indicators of scientific research

This section describes briefly the main quality indicators of scientific production (periods of research activity, experience in supervising doctoral theses, total citations, articles in journals of the first quartile, H index...). It also includes other important aspects or peculiarities.

- **25** scientific articles (3 not appearing in scopus yet)
- Total number of citations = **1320**- Total number of publications in the first quartile (Q1) = **25** and first decile (D1) = **24**
- H-index = **16**



Victoria Osorio Torrens

Surname(s): **Osorio Torrens**
Name: **Victoria**
ORCID: **0000-0002-3500-674X**
ScopusID: **35867433000**
Contact aut. region/reg.: **Catalonia**

Current professional situation

Employing entity: INSTITUTO DE DIAGNOSTICO AMBIENTAL Y ESTUDIOS DEL AGUA

Type of entity: State agency

Professional category: Ramón y Cajal Postdoctoral Fellow

Educational Management (Yes/No): No

City employing entity: Barcelona, Catalonia, Spain

Email: victoria.osorio@idaea.csic.es

Start date: 01/01/2023

Type of contract: Grant-assisted student (pre or post-doctoral, others) **Dedication regime:** Full time

Primary (UNESCO code): 230000 - Chemistry; 240000 - Life Science; 250000 - Earth and space sciences; 310000 - Agricultural Sciences; 320000 - Medical Science; 330000 - Technological Science.

Secondary (UNESCO code): 230100 - Analytical chemistry; 241400 - Microbiology; 250800 - Hydrology; 251100 - Soil Science; 310300 - Agronomy; 320400 - Occupational medicine; 330800 - Environmental technology and Engineering

Tertiary (UNESCO code): 230102 - Biochemical analysis; 230103 - Chromatographic analysis; 230110 - Mass spectroscopy; 239100 - Environmental Chemistry; 241404 - Bacteriology; 250804 - Ground water; 250811 - Quality of water; 250813 - Soil moisture; 250814 - Surface waters; 251104 - Soil chemistry; 251109 - Soil microbiology; 310306 - Field crops; 310391 - Use (management) combined water and fertilizer; 310490 - Livestock production systems; 321200 - Public health; 330804 - Pollution engineering; 330806 - Reclamation of water; 330810 - Sewage technology; 330811 - Water pollution control

Performed tasks: Develop and validate an innovative approach for Effect Directed Analysis (EDA) using freshwater organisms for the chemical and ecological quality assessment of the aquatic environment.

Identify key words: Analytic chemistry; Soil science; Pollution; Degradation of the environment; Water management; Environmental policy; Molecular, cellular and genetic biology; Livestock; Agriculture

Field of management activity: Public Research Body

Previous positions and activities

	Employing entity	Professional category	Start date
1	INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA	MSCA-COFUND Postdoctoral Researcher	01/04/2021
2	Universitat de Girona	Associate Professor	01/10/2020
3		Professional career break - Maternity	01/06/2021

	Employing entity	Professional category	Start date
4	FUNDACIO UNIVERSITARIA BALMES DE VIC	Postdoctoral Researcher	21/01/2019
5	University of Liège	MSC-COFUND Postdoctoral Researcher	31/12/2016
6		Professional career break - Maternity	01/09/2015
7	KWR Watercycle Research Institute	MSC-ITN-Experienced Researcher	31/08/2013
8	Consejo Superior de Investigaciones Científicas	Early stage researcher (PhD student)	01/01/2009
9	Asesoría de Estudios SOL	Teacher in Analytical Chemistry	01/10/2007

- 1** **Employing entity:** INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA
Department: Water Quality, INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA
City employing entity: Girona, Catalonia, Spain
Professional category: MSCA-COFUND Postdoctoral Researcher
Educational Management (Yes/No): No
Email: srodriguez@icra.cat
Start-End date: 01/04/2021 - 31/12/2022
Duration: 1 year - 8 months - 30 days

Type of contract: Grant-assisted student (pre or post-doctoral, others)

Dedication regime: Full time

Performed tasks: The project to be performed is entitled REST-RESIST (Antibiotics of RESTRICTed use and corresponding RESISTant genes: tracking their emergence and fate in the environment and assessing natural and engineered attenuation processes to mitigate their spread) and consists in six WorkPackages (WP). REST-RESIST objectives will be addressed through the four main work packages (WP1-WP4), WP5 will gather together project deliverables and outcomes dissemination and WP6 will be dedicated to project management and training. - WP1 will be devoted to optimize and develop robust chemical analytical methods and bio-molecular assays, by state-of-the-art sample preparation and instrumental techniques, to determine: (i) Antibiotics of restricted use in veterinary (class B-ABs), their microbial and photolytic TPs and (ii) selective Antibiotic Resistant Genes (ARGs) in complex environmental samples. For B-ABs analysis, sample preparation will be performed by Solid Phase Extraction (SPE) for liquid matrices (i.e. groundwater, surface water, wastewater influent and effluent, drinking water and recycled water); and Pressurized Liquid Extraction (PLE) followed by SPE purification for solid matrices (i.e. sludge, sediments, soils, animal manure and foodstuffs). Instrumental analysis will be performed by Ultra-High-Performance-Liquid-Chromatography (UHPLC) coupled to Quadrupole-Linear-Ion-Trap (QqLIT) tandem mass spectrometry. Abundance of ARGs conferring resistance to B-ABs, such as colistin (*mcr1*), will be measured in the samples by DNA extraction and quantification using real time PCR (qPCR) assays. - WP2 will focus on field monitoring studies, to characterize the distribution of B-ABs and selective ARGs in different environmental compartments over a territory highly impacted by livestock activity. Complex environmental samples of different matrices will be collected and analyzed to determine levels of B-ABs and ARGs using methods developed in WP1. The occurrence and fate in the total environment of B-ABs and ARGs investigated will evidence their dissemination pathways throughout the environment as well as the exposure routes to human population. Moreover, the relationships between concentrations of B-ABs and abundances of ARGs determined will disentangle the role of B-ABs use on selective ARGs spread. After target analysis, the same extracts will be analyzed by UHPLC coupled to High Resolution Mass Spectrometry (HRMS), using an LTQ Orbitrap VelosTM system (ThermoScientificTM). Accurate mass measurements in full scan and dependent MS2 fragmentation acquisition modes will be recorded in positive and negative ionization modes for further (WP4) retrospective analysis of B-ABs' TPs. - WP3 will evaluate natural and engineered attenuation processes for the removal and remediation of levels of B-ABs present in urban (i.e. WWi) and livestock waste (i.e. AM) and SWs and environmental soils. To this purpose, degradation/transformation experiments will be performed in (i) activated sludge bio-reactors simulating conventional biodegradation treatment applied in WTPs treating urban and livestock wastes; (ii) photo-reactors using artificial and natural UV light mimicking photodegradation processes applied in advanced WTP and naturally occurring in the environment in SW and soils; and (iii) soil

mesocosms simulating biodegradation in the rizhosphere zone of plants from crop fields (foreseen secondment). - WP4 will investigate the occurrence of microbial and photolytic TPs of B-ABs in the environment in order to comprehensively understand the overall fate of B-ABs. TPs of B-ABs will be elucidated in extracts obtained from transformation experiments performed in WP3. Structural elucidation of unknown TPs will be performed by accurate mass measurements in full scan and MS2 fragmentation acquisition modes. Identified TPs will be screened for retrospective analysis in HRMS data acquired by untargeted analysis in WP2. The identification of TPs of B-ABs in the envir...

Identify key words: Natural resources; Waste; Pollution; Degradation of the environment; Water management; Bacteriology; Livestock

Field of management activity: Foundation

Applicability in teaching and/or research: REST-RESIST tackles an issue with high societal relevance in Europe and particularly in Spain, where B-ABs such as Colistin are extensively used in livestock. REST-RESIST aims are aligned with current research activities and H2020 projects (e.g. DISARM, ID 817591; JPI-EC-AMR, ID 681055) funded by the EC, that are addressed to reduce AR burden on the European population. REST-RESIST results will provide a high added value to EC key objective to tackle AR threat, i.e. boosting research, development and innovation. Current national PRAN efforts are focused on sensitization campaigns promoting to reduce the consumption of ABs among human population and particularly in livestock. However, PRAN strategy also claims for scientists aiming to: (i) gather further insight in the knowledge of ABs behavior and fate, once they are consumed and released into the environment, as well as mechanisms involved in AR development; (ii) investigate on methods to evaluate the risk of AR development and spread and (iii) explore cost-effective methodologies to mitigate their pseudo-persistence and spread in the environment. REST-RESIST responds to this claim, outcomes will provide management authorities and stakeholders (i) sound evidences of the current status of B-ABs and ARGs conferring resistance to them in the environment at the local level, demonstrating the effectiveness of sensitization campaigns to reduce B-ABs consumption (classified as of restricted use) and (ii) set a light on the potential of engineered and natural attenuation processes to remove or remediate B-ABs and selected ARGs from urban and livestock wastes or the environment, which will critically contribute to implement ongoing actions to mitigate the spread of these contaminants and prevent serious environmental and human health issues. REST-RESIST faces the challenge of the investigation on AR spread from a "One Health" perspective. The One Health concept recognize that human health is tightly connected to the health of animals and the environment, for example that animal feed, human food, animal and human health, and environmental contamination are closely linked. REST-RESIST will investigate the emergence and spread B-ABs, their TPs and ARGs conferring resistance to them considering all sources and reservoirs involved in their cycle: from human, animal, vegetable and environmental origin. Besides, the project topic is well in line with other ongoing projects on AR under the One Health European Joint Programme (OHEJP), such as "AR ARDIG: Antibiotic Resistance Dynamics: the influence of geographic origin and management systems on resistance gene flows within humans, animals and the environment" (2018-2021) or "RaDAR: Risk and Disease burden of Antimicrobial Resistance" (2018-2020). The main focus of OHEJP is to reinforce collaboration between institutes by enhancing transdisciplinary cooperation and integration of activities by means of dedicated Joint Research Projects. REST-RESIST has foreseen this premise, as the fellow will work in close collaborations with scientists of complementary disciplines. The outcomes of the project will (i) inspire new initiatives, (ii) open further research, and (iii) strengthen multi- and inter-disciplinary cooperation and integration of research activities to understand, prevent, manage and mitigate AR burden. Ultimate goal of REST-RESIST is to describe thoroughly the current status of B-ABs and ARGs conferring resistance to them in the environment, providing strong evidences that will inspire and foster initiatives and measures to hamper AR threat at both the national -Spain- and International level -Europe-.

2 Employing entity: Universitat de Girona

Department: Chemistry, Universitat de Girona

City employing entity: Girona, Catalonia, Spain

Professional category: Associate Professor

Educational Management (Yes/No): Yes

Start-End date: 01/10/2020 - 31/08/2022

Type of contract: Temporary employment contract

**Dedication regime:** Part time

Performed tasks: Teaching activities on the following subjects: - Bioanalysis: Analytical methodologies for the determination of biomolecules and biological, clinical and pharmaceutical substances. Immunochemical and enzymatic analysis. Sensors and biosensors. Advanced methodologies in chromatography and mass spectrometry. (Optional subject in 4th course program of Biotechnology and Chemistry Degrees) - Water Quality: Water composition and pollution. The concept of water quality. Regulatory issues. Water quality indicators (physicochemical, microbiological, biological). Water quality indexes. Monitoring and control of water quality. (Optional subject in Master Degree in Science and Technology of Hydrological Resources) - Experimentation in Quantitative Instrumental Methods: Use of instrumental methods and techniques of analysis. (Obligatory subject in 3rd course program of Biotechnology Degree and 5th course program of Double Degree in Biology and Biotechnology) - Experimentation in Analytical Chemistry: Analytical laboratory for the determination of organic and inorganic compounds. Applications of the main instrumental techniques in Analytical Chemistry: chromatographic, optical, electrochemical, etc. Quality management in the analytical laboratory. (Obligatory subject in 3rd course program of Chemistry Degree) - Integrated Practices: Application to the production and characterization of a biotechnology product at laboratory scale. (Obligatory subject in 3rd course program of Biotechnology Degree and 5th course program of Double Degree in Biology and Biotechnology)

Identify key words: Analytic chemistry

Applicability in teaching and/or research: Full applicability in teaching. I am gaining experience in educational management and particularly in teaching subjects related with analytical chemistry, biotechnology, biology and hydrology sciences as well as improving my communication skills

3 Professional category: Professional career break - Maternity

Start-End date: 01/06/2021 - 14/03/2022

Duration: 9 months - 15 days

4 Employing entity: FUNDACIO UNIVERSITARIA BALMES DE VIC

Department: BETA Technological Center, Universitat de Vic-Universitat Central de Catalunya

City employing entity: Vic, Catalonia, Spain

Professional category: Postdoctoral Researcher **Educational Management (Yes/No):** No

Phone: (+34) 938 816 168 - 8145

Email: sergio.ponsa@uvic.cat

Start-End date: 21/01/2019 - 20/01/2021

Duration: 2 years

Type of contract: Temporary employment contract

Dedication regime: Full time

Primary (UNESCO code): 230101 - Absorption spectroscopy; 230103 - Chromatographic analysis; 230106 - Fluorimetry; 230107 - Gravimetry; 230110 - Mass spectroscopy; 230119 - Volumetry; 230331 - Water chemistry; 239100 - Environmental Chemistry; 310300 - Agronomy; 310490 - Livestock production systems; 330801 - Air pollution control; 330810 - Sewage technology; 330811 - Water pollution control; 331108 - Laboratory equipment; 331113 - Scientific apparatus

Performed tasks: Optimization, validation, and quality assurance of instrumental analytical methods applied to the assessment of chemicals in complex environmental samples and residues from anthropogenic activities. - Optimization and validation of analytical methods using Gas Chromatography coupled to Mass Spectrometry detection for the quantitative determination of Taste & Odour Compounds (i.e. geosmin) in surface and drinking water. - Optimization and validation of analytical methods using Ionic Chromatography coupled to Electrochemical detection for the quantitative determination of nitrates and phosphates in complex solid and liquid matrices from agroindustry or animal manure origin. - Optimization and validation of analytical methods using ionic Gas Chromatography coupled to Electron Capture Detector (GC-ECD) for the simultaneous determination of green-house gas emissions. - Optimization and validation of analytical methods using ionic Total organic Carbon Analyzer for the quantitative determination of organic carbon and nitrogen species in solid and liquid matrices from agroindustry or animal manure origin. - Optimization and validation of analytical methods using atomic absorption for the quantitative determination of metals in samples from agroindustry or animal manure origin. - Optimization and validation of analytical methods using ionic Elemental Analyzer for the simultaneous determination of carbon, hydrogen and nitrogen species in solid and liquid matrices from agroindustry or animal manure origin.

Identify key words: Soil analysis; Plant resources; Water resources; Animal resources; Soil resources; Ertrophication; Pollution of waterways; Pollution from land based sources; Pollution from agricultural sources; Organic pollution; Chemical pollution; Greenhouse effect; Polluted area; Water consumption; Water treatment; Water analysis; Pollution control measures; Environmental research; Community environmental policy; Quality of the environment; Environmental monitoring; Environmental impact; Environmental law; Livestock farming; Livestock; Fertiliser

Field of management activity: University

Applicability in teaching and/or research: During this period I was involved in diverse ongoing projects with several technology and knowledge transfer activities planned at CT BETA. - First, PECT-Osona was a specialization and Territorial Competitiveness Project aimed at stablishing good practices on the management of livestock wastes by the agricultural sector of the Osona region (NE, Spain). Specific tasks of the project were: (1) the qualitative and quantitative monitoring of livestock waste and soil quality and Waters; (2) to evaluate improvements available technologies and innovation in the field of fertilization; and (3) to promote R&D projects in the livestock sector. I was actively involved in the project and I contributed to task 2 with the optimization, validation and quality assurance of instrumental analytical methods applied to the chemical quality assessment of residues from livestock activities and products to re-use obtained after treatment of livestock wastes by available technologies. - Second, an agreement with Aigües de Vic and Aigües d'Osona drinking water companies to investigate and predict the mechanism and behavior of Taste and Odour compounds (TOCs) occurrence in the upper-mid section of Ter watershed. I was focused in developing, validating and providing quality assurance of instrumental analytical methods applied for the quantitative determination of TOCs present in SW intended for DW production. BETA provides DW companies with up-to-date TOCs levels in the river, which are needed to implement appropriate treatment in the plant for the production of DW that meets required quality thresholds. - Third, I contributed with my expertise on the assessment of water bodies quality status to the ongoing project at BETA INTCATCH (H2020). This project aimed to deliver technological innovation in water quality monitoring to instigate a paradigm shift in the management of surface water quality that is fit for global waters in the period 2020-2050. - Fourth, the agreement with the company Selecció Deseuras S.L. aiming to (i) deliver technical and scientific assessment in the optimization and improvement of the performance of the company's treatment plant for the re-valorization of animal manure; (ii) coordination of sampling, analysis and tests tasks to be conducted both at the plant and laboratory scale; (iii) physicochemical characterization of samples derived from the different treatment steps of the plant. - Fifth, the agreement with the company Granges Terragrisa S.L.U. for the assessment of the presence of contaminants of pharmaceuticals (PhACs) of veterinary use origin in animal manure. I was involved in the Demonstration Activity (Technological Transfer of the Programme for Rural development in Catalonia 2014-2020) aiming to demonstrate the capability of technologies applied in animal manure treatment re-valorization for the removal of veterinary PhACs. To these last two collaborations I provided my thorough expertise on the assessment of PhACs in the environment and contributed to dissemination and outreach activities of the outcomes. For instance, elaborated, together with other co-authors, a technical guideline on the use of veterinary PhACs addressed to actors from the livestock sector. Together with the document, I contributed to the elaboration of a dissemination video about the topic of the technical document entitled "Demostración de la capacidad de reducción de antibióticos en tecnologías de tratamiento de purines- Guía técnica de asesoramiento para el sector ganadero" and the video is available on the following link: <https://www.youtube.com/watch?v=-aVMxT7DNJQ>

- 5** **Employing entity:** University of Liège **Type of entity:** University
Department: Chemistry Department, Mass Spectrometry Laboratory
City employing entity: Liège, Belgium
Professional category: MSC-COFUND **Educational Management (Yes/No):** No
Postdoctoral Researcher
Phone: (+32) 43663414 **Fax:** (+32) 43664387 **Email:** e.depauw@uliege.be
Start-End date: 31/12/2016 - 31/12/2018 **Duration:** 2 years
Type of contract: Grant-assisted student (pre or post-doctoral, others)
Dedication regime: Full time



Primary (UNESCO code): 230103 - Chromatographic analysis; 230110 - Mass spectroscopy; 230199 - Other (specify); 230690 - Chemistry of Natural Products Organic; 239100 - Environmental Chemistry; 310110 - Plant growth regulators

Secondary (UNESCO code): 230100 - Analytical chemistry; 330201 - Antibiotics technology

Performed tasks: Project title: Mass spectrometry imaging of model biological systems interacting with active molecules Study of cyclic lipopeptides (CLPs) metabolized by plant-growth promoting bacteria in the rizosphere zone exerting specific bioactivities beneficial for the plant. I conducted structural characterization of CLPs by (UPLC-ESI(+)-HRMS/MS) to provide a tool for unequivocal identification of the specific isoforms of these metabolites produced under different culture conditions. The outcomes allowed selecting the optimal bacteria growth conditions boosting the production of the more bioactive CLPs. Besides, I optimized analytical methods for the HRMS Imaging of CLPs in bacteria colonies during microbial interaction, using Matrix Assisted Laser Desorption Ionization coupled to a Fourier Transform Ion Cyclotron Resonance analyzer (MALDI-FTICR) and/or applying Liquid Extraction Surface Analysis (LESA) coupled to ESI-FTICR. With these methods CLPs produced by different bacteria species were identified and their diffusion in the rizosphere zone during their interaction with other microorganisms present (e.g. bacteria, pathogens) could be described. Below are summarized in more in detail, the tasks performed within the project for the study of cyclic lipopeptides and other metabolites, exerting antibiotic activity that are produced by Bacillus bacteria during microbial communication among bacteria, plant and plant pathogens. Identification and characterization of chemical structures: - Identification and structural elucidation by Ultrahigh Performance Liquid Chromatography interfaced by an Electrospray Ionization Source to a High Resolution Mass Tandem Spectrometer (UPLCESI(+)-HRMS/MS) of Surfactins produced by Bacillus amyloliquefaciens under different microbial culture conditions. - Characterization of fragmentation patterns of the every isoform of surfactin detected in extracts obtained from different bacteria cultures prepared at lab scale and analyzed by UPLC-ESI(+)-HRMS/MS in order to provide a tool for unequivocal identification of the specific metabolites produced under different culture conditions and estimation of their relative abundances among the diverse samples. - Identification of lipopeptides and other metabolites produced during bacteria-bacteria interactions by UPLC-ESI(+)-HRMS/MS. Mass Spectrometry Imaging: - Optimization of instrument conditions for the analysis of surfactins and other metabolites produced in planta by bacteria colonizing plant roots during interaction with a plant pathogen and bacteriabacteria interactions by HRMS Imaging. - Optimization of sample preparation methods for the HRMS Imaging of Surfactins and other metabolites produced by bacteria colonies during microbial interaction using Matrix Assisted Laser Desorption Ionization coupled to a Fourier Transform Ion Cyclotron Resonance analyzer (MALDI-FTICR) or applying Liquid Extraction Surface Analysis (LESA) coupled to ESI-FTICR. Dissemination of results in conferences.

Identify key words: Mass spectrometry; Quality/metrology; Liquid chromatography (uv, luminisence, ms, electrochemical, etc); Antibiotics; Isolation and structural determination; Natural resouces; Cultivation of agricultural land

Field of management activity: University

Applicability in teaching and/or research: During my postdoctoral stay at the University of Liège, I investigated the metabolism and behavior of cyclic lipopeptides (CLPs), natural metabolites of rhizobacteria that could be used as bio-stimulants for crop protection in agriculture. This research was performed in collaboration with researchers from Gembloux Agro-Bio Tech-University of Liège, who performed the microbiological experiments with different strains of rhizobacteria and provided bacteria cultures and extracts in which I identified and elucidated the chemical structures of CLPs and also studied their metabolism. My findings provided new insights on the most active metabolites and the most efficient bacteria growing conditions for the production of these compounds and its use in agriculture, and contributed to form a basis for the RHIZOCLIP project (EOS Programme 2018, coordinated by the University of Ghent) in which the University of Liege is partner. Results of this research were disseminated through different outreach activities (seminars, workshops and congresses) and are planned to be disseminated as the following publication papers: - "Surfactin stimulated by root molecular patterns acts as a key driver of Bacillus-plant mutualistic interaction" submitted as co-author to the journal PNAS (Proceedings of the National Academy of Sciences of the United States of America) - "Structural elucidation of Surfactins produced by Bacillus amyloliquefaciens under different culture conditions" under preparation as first author

**6 Professional category:** Professional career break - Maternity**Start-End date:** 01/09/2015 - 30/12/2016**Duration:** 1 year - 3 months**7 Employing entity:** KWR Watercycle Research Institute**Type of entity:** Innovation and Technology Centres**Department:** Water Quality, KWR Watercycle Research institute**City employing entity:** Nieuwegein, Utrecht, Holland**Professional category:** MSC-ITN-Experienced Researcher**Educational Management (Yes/No):** Yes**Phone:** (+31) 030-6069655**Email:** stefan.Kools@kwrwater.nl**Start-End date:** 31/08/2013 - 31/08/2015**Duration:** 2 years**Type of contract:** Grant-assisted student (pre or post-doctoral, others)**Dedication regime:** Full time**Primary (UNESCO code):** 230103 - Chromatographic analysis; 230110 - Mass spectroscopy; 239000 - Pharmaceutical Chemistry; 239100 - Environmental Chemistry; 330301 - Catalysis technology; 330804 - Pollution engineering**Secondary (UNESCO code):** 230100 - Analytical chemistry

Performed tasks: Project title: Innovative hybrid sample preparation techniques and compilation of a comprehensive chemical analytical toolbox for EDA in the framework of ITN EDA-EMERGE project (Novel tools in effect-directed analysis for identifying and monitoring emerging toxicants on a European scale). Tasks: - Participation in the European Demonstration Program (EDP) consisting on the sampling of large volumes of drinking water, surface water and wastewater effluents from well-known sites of different European river basins with a large volume solid phase extraction (LV-SPE) device. - Development and validation of an analytical procedure based on LC-MS/MS for the analysis of diglyme, triglyme, tetraglyme and aclonifen in LV-SPE extracts from drinking water, surface water and wastewater samples collected during the EDP program. - Development and validation of an analytical procedure based on LC-HRMS/MS for the analysis of 20 glucocorticoids in LV-SPE extracts from drinking water, surface water and wastewater samples collected during the EDP program. - Development and validation of an analytical procedure in EDA relying on off-line mixed-bed multi layer SPE for the target analysis of 118 common organic compounds of environmental concern in surface waters and application of extracts for combined LC-HRMS/MS analysis and CALUX bioassays. - Contribution to a Higher-Tier EDA study in collaboration with IVM-VU for the analysis of 118 common organic compounds of environmental concern in surface water samples collected during the EDP program. The potential neurotoxicity of SW samples will be tested by exposure experiments on snails and effects observed will be related with the compounds detected at higher levels. - Supervision of ESRs research projects contributing to the workpackage two (WP2) of the EDA-EMERGE project on Chemical Tools. - Compilation of a comprehensive chemical analytical toolbox for extraction, fractionation and structure elucidation in EDA. Coordination and integration of the multiple tool development in WP2 and report of the subsequent deliverable on chemical tools in EDA. - Co-organisation of a Specialized Course on Water Cycle and Human Health in the frame of the hosting institute training activities.

Identify key words: Mass spectrometry; Hibrid techniques; Taking sample; Solid phase extraction; Sample system introduction; Multi-variate methods; Statistical methods; Chemical metrologies (drawing up, uncertainty); Quality control; Analytical methods validation; Gas chromatography (fid, ecd, ms, etc); Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Luminescence spectrometry (flourescence, quimio(bio) luminiscence, etc); Bioorganic; Antibiotics; Isolation and structural determination; Methodology; Synthesis of active biological compounds; Physical-chemistry organic

Field of management activity: Public Research Body

Applicability in teaching and/or research: During this international stay, I developed novel analytical methods using cutting-edge instrumental technologies for the combined chemical and biological analysis of complex environmental matrices under the umbrella of the EDA-EMERGE project. With these outcomes, I provided new tools to be implemented in the assessment of chemical and ecological quality status of water bodies based on an Effect Directed Analysis (EDA), useful for the implementation of the Water Framework Directive (WFD). EDA approaches for environmental

assessment are gaining relevance within water management authorities, since they enable the identification of key toxicants in the environment. Besides, I applied the analytical methods developed in several monitoring campaigns on European River basins in collaboration with other European Research institutes and drinking water companies. Since levels of contaminants of emerging concern (CECs) and toxicity could be determined in the same sample, I managed to relate chemical to toxicity response in order to identify key toxicants present in the water bodies assessed. These outcomes provided EC, water management authorities and stakeholders a valuable database to be used for further quality monitoring assessment of water bodies. Results of this research were published as the following scientific papers: - "Pesticide mixture toxicity in surface water extracts in snails (*Lymnaea stagnalis*) by an in vitro acetylcholinesterase inhibition assay and metabolomics" in Environmental Science and Technology journal (2016) as co-author - "European demonstration program on the effect-based and chemical identification and monitoring of organic pollutants in European surface waters" in Science of the Total Environment journal (2017) as co-author - "A novel sample preparation procedure for effect-directed analysis of micro-contaminants of emerging concern in surface waters" in Talanta journal (2018) as first author In addition, I reported as a deliverable a scientific-technical document providing the results of the supervision I performed on WP2 of the project EDA-EMERGE, about Chemical Tools. The document was entitled: - "EDA grows stronger: towards the implementation of a state-of-the-art chemical toolbox within the EDA-EMERGE project".

- 8** **Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
- Department:** Water and Soil Quality Research Group (Department of Environmental Chemistry), IDAEA-CSIC Research Institute
- City employing entity:** Barcelona, Catalonia, Spain
- Professional category:** Early stage researcher (PhD student) **Educational Management (Yes/No):** No
- Phone:** (+34) 934 006 100 - 5308 **Fax:** (+34) 932 045 904 **Email:** dbcqam@cid.csic.es
- Start-End date:** 01/01/2009 - 30/07/2013 **Duration:** 4 years - 6 months
- Type of contract:** Temporary employment contract
- Dedication regime:** Full time
- Primary (UNESCO code):** 230100 - Analytical chemistry; 230217 - Intermediary metabolism; 230219 - Metabolic processes; 230220 - Microbiological chemistry; 230600 - Organic chemistry; 239000 - Pharmaceutical Chemistry; 239100 - Environmental Chemistry; 241403 - Bacterial metabolism; 241407 - Microbial metabolism; 241408 - Microbial processes; 330804 - Pollution engineering; 330810 - Sewage technology; 330811 - Water pollution control
- Secondary (UNESCO code):** 239100 - Environmental Chemistry
- Performed tasks:** SCARCE project: - Collection and treatment (i.e. SPE and pressurized liquid extraction, PLE) of river surface water, wastewater, particulate matter and sediment samples. - LC-MS/MS analysis of 76 pharmaceuticals in samples collected. - Application of statistical tools to study the fate of the pharmaceuticals analyzed along the River Basins studied. - Environmental risk assessment of the pharmaceuticals determined in surface waters on non-target aquatic organisms (i.e. algae, *Daphnia Magna* and fish). - Study of fate and behavior of pharmaceuticals during the wastewater treatment relying on conventional activated sludge. - Development and validation of an analytical procedure relying on off-line mono-bed SPE followed by LC-MS/MS for the target analysis of diclofenac, sulfametoxazole and their transformation products in wastewaters and surface waters. - Performance of lab scale biodegradation experiments in activated sludge to elucidate unknown biotransformation products and reaction mechanisms of diclofenac and other analgesics with related chemical structures. - LC-HRMS/MS analysis for the identification and structural elucidation of bio- and photo-transformation products of pharmaceuticals triggered during natural and engineered attenuation processes occurring in soil and water compartments - Contribution to project reports and databases. VIECO project: - Collection and treatment (i.e. solid phase extraction, SPE) of river surface water samples. - LC-MS/MS analysis of 73 pharmaceuticals in samples collected. - Application of modelling approaches and statistical tools to study the fate of the pharmaceuticals analyzed along the catchment studied. - Assessment of the effects of multiple stressors (i.e. pharmaceuticals and hydrology) on microbiological attached communities (i.e. biofilms) in the river



studied. - Contribution to project reports. - Dissemination of results in seminars and conferences.
- Dissemination of results in seminars and conferences.

Identify key words: Taking sample; Solid phase extraction; Sample system introduction; Multi-variate methods; Statistical methods; Methods of optimization and experimental design; Quality/metrology; Automatization and miniaturization; Gas chromatography (fid, ecd, ms, etc); Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Luminescence spectrometry (flourescence, quimio(bio) luminiscence, etc); Screening systems; Natural products; Synthetic organic chemistry; Pharmaceutics chemistry; Atmospheric and environmental chemistry; Electrochemical; Natural sciences and health sciences

Applicability in teaching and/or research: Within the national project SCARCE (2010-2013) aimed at evaluating and predicting the effects of global change on the quantity and quality of iberian rivers, I assessed the occurrence, fate and risk of pharmaceuticals (PhACs) in Iberian river basins. I reported levels of PhACs determined in different compartments of the water column (i.e. sediment, water and particulate matter, and also WWe from discharging WWTPs) along the whole basin through two extensive monitoring campaigns performed within two consecutive years. I built a valuable data archive on the presence and distribution of PhACs along the main four Iberian river basins that was used in further modeling, ecological, hydrological and socio-economic studies as well as risk assessment, opening the path to numerous top scientific publications. All these outcomes enabled the characterization of the river basins in terms of PhACs pollution and triggered water management authorities and stakeholders valuable reference data for decision making process in the context of the Water Framework Directive (WFD) implementation. Indeed, the project covered transfer to society and had the support of different stakeholders (Water Agencies, Confederaciones Hidrográficas) as well as other agents (such as irrigation communities). At the beginning of my scientific career I joined VIECO project (2008-2010) aiming to develop and validate a cost-effective integrated platform for biological and chemical monitoring in freshwater bodies to facilitate the WFD implementation. In particular, I worked on the assessment of PhACs in SW from a sewage-impacted section of a Mediterranean river along four intensive monitoring campaigns performed under different climate and hydrological conditions. I described how the gradient of pollution -from up to downstream- due to the loads of PhACs discharged by WWTPs located along the basin, was affected by climate and hydrological conditions in the catchment. I also participated in the optimization of the use of microbial attached communities (biofilms) as bio-indicators of river ecosystem health and responses to pollutants (i.e. PhACs) that was included in the cost-effective integrated platform developed and delivered to end users. This project was directly focused to the transfer of knowledge to water management agencies and drinking water companies in order to support them in decision making process in the context of the WFD implementation. The Catalan Water Agency was the main stakeholder of VIECO project, that was leaded by CETAQUA (an international technological center which aim to propose innovative solutions to companies, governments and society in the area of the integral water cycle) and had 6 additional partners related with water cycle management and research (AGBAR, LABAQUA, AQUAPLAN, AMPHOS XXI, CTM and ICRA). In the framework of SCARCE and VIECO projects I disseminated my research results as the following scientific publications:
- "Investigating the formation and toxicity of nitrated and nitrosated transformation products of Diclofenac and Sulfamethoxazole in WWTPs" as first author in Journal of Hazardous Materials (2016)
- "Concentration and risk of pharmaceuticals in freshwater systems are related to the population density and the livestock units in Iberian Rivers" as first author in Science of the Total Environment journal (2016) - "Transcriptomic, biochemical and individual markers in transplanted Daphnia magna to characterize impacts in the field" as co-author in Science of the Total Environment journal (2015)
- "Hydrological variation modulates pharmaceutical levels and biofilm responses in a Mediterranean river" as first author in Science of the Total Environment journal (2014) - "Simultaneous determination of diclofenac, its human metabolites and microbial nitration/nitrosation transformation products in wastewaters by liquid chromatography/quadrupole-linear ion trap mass spectrometry" as first author in Journal of Chromatography ...

9 Employing entity: Asesoría de Estudios SOL

Department: Asesoría de Estudios SOL, Private Academy

City employing entity: Barcelona, Catalonia, Spain

Professional category: Teacher in Analytical Chemistry **Educational Management (Yes/No):** Yes

**C****V****n**

CURRÍCULUM VITAE NORMALIZADO

81636ce5aac213d28ca4823f7650b3fd

Phone: (+34) 93 490 82 42**Email:** secresabino@academiasol.com**Start-End date:** 01/10/2007 - 01/07/2009**Duration:** 1 year - 8 months**Type of contract:** Temporary employment contract**Dedication regime:** Part time**Primary (UNESCO code):** 230100 - Analytical chemistry**Performed tasks:** Teaching activities related to Analytical Chemistry subjects of B.Sc. in Chemistry, Engineered Chemistry and Pharmacy. The tasks included preparing B.Sc. Chemistry, Engineered Chemistry and/or Pharmacy students to learn the principles of Analytical Chemistry: extensive and/or intensive courses on theory and applied exercises as well as preparation for official B.Sc. exams.**Identify key words:** Analytic chemistry**Field of management activity:** Teacher**Applicability in teaching and/or research:** I succeed to manage groups of maximum 10 people for extensive courses and maximum 30 people for intensive courses; achieving a high percentage (more than 60 % of students) of good marks (7 or higher out of 10) in official exams. This activity provided me a solid basis with a wide expertise in the field of education in analytical chemistry and abilities such as communication skills, management and organization, to be capable to perform the teaching activities that I am currently developing at the Chemistry Department of the University of Girona.



Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

1 **University degree:** Higher degree

Name of qualification: Official Master in Environmental Analytical Chemistry

City degree awarding entity: Barcelona, Catalonia, Spain

Degree awarding entity: Universitat de Barcelona **Type of entity:** University

Date of qualification: 25/10/2010

Average mark: Excellent

Standardised degree: Yes

2 **University degree:** Higher degree

Name of qualification: Experimental master in Analytical Chemistry

City degree awarding entity: Barcelona, Catalonia, Spain

Degree awarding entity: Universitat de Barcelona **Type of entity:** University

Date of qualification: 20/01/2009

Average mark: Excellent

Standardised degree: Yes

3 **University degree:** Higher degree

Name of qualification: B.Sc Chemistry

City degree awarding entity: Barcelona, Catalonia, Spain

Degree awarding entity: Universitat de Barcelona **Type of entity:** University

Date of qualification: 15/07/2008

Average mark: Good

Standardised degree: Yes

Doctorates

Doctorate programme: PhD in Environmental Analytical Chemistry

Degree awarding entity: Universitat de Barcelona **Type of entity:** University

City degree awarding entity: Barcelona, Catalonia, Spain

Date of degree: 12/11/2015

European doctorate: Yes

Thesis title: Fate, modeling and risk of pharmaceuticals in wastewater treatment plants and Iberian rivers

Thesis director: Damià Barceló Cullerés

Obtained qualification: cum laude

Standardised degree: Yes

Specialised, lifelong, technical, professional and refresher training (other than formal academic and healthcare studies)

- 1** **Type of training:** Course
Training title: Formación en Buenas Prácticas de Laboratorio” (Training in Good Laboratory Practices)
City awarding entity: Barcelona, Spain
Awarding entity: Sociedad Española de Garantía de Calidad en Investigación **Type of entity:** Associations and Groups
End date: 17/09/2020 **Duration in hours:** 8 hours
- 2** **Type of training:** Course
Training title: Course on Protein Purification
City awarding entity: Liège, Belgium
Awarding entity: University of Liège
Aims of the entity: F.R.S-F.N.R.S Graduate School Course
End date: 04/05/2018 **Duration in hours:** 24 hours
- 3** **Type of training:** Course
Training title: Science-based policy support with regard to emerging pollutants / Monitoring & Monitoring and Assessment in the context of the Water Framework Directive
City awarding entity: Rome, Italy
Awarding entity: Istituto Superiore di Sanità (ISS) **Type of entity:** Public Research Body
Aims of the entity: MSCA International Training Network
End date: 04/12/2014 **Duration in hours:** 8 hours
- 4** **Type of training:** Course
Training title: Special course on theory and practice of gene arrays
City awarding entity: Aachen, Germany
Awarding entity: RWTH Aachen University **Type of entity:** University
Aims of the entity: MSCA International Training Network
End date: 29/10/2014 **Duration in hours:** 8 hours
- 5** **Type of training:** Course
Training title: Statistic course – Environmental statistics using R
City awarding entity: Aachen, Germany
Awarding entity: RWTH Aachen University **Type of entity:** University
Aims of the entity: MSCA International Training Network
End date: 28/10/2014 **Duration in hours:** 8 hours
- 6** **Type of training:** Course
Training title: FILM course – interview training for early researchers
City awarding entity: Aachen, Germany
Awarding entity: RWTH Aachen University **Type of entity:** University
Aims of the entity: MSCA International Training Network
End date: 27/10/2014 **Duration in hours:** 8 hours
- 7** **Type of training:** Course
Training title: Advanced course on preparative and analytical chromatography in effect-directed analysis
City awarding entity: Zagreb, Croatia



Awarding entity: Institut Ruđer Bošković (IRB) **Type of entity:** R&D Centre
Aims of the entity: MSCA International Training Network
End date: 03/07/2014 **Duration in hours:** 16 hours

8 Type of training: Course
Training title: Hyphenation of cell-based assays with microfractionation procedures
City awarding entity: Amsterdam, Holland
Awarding entity: IVM-VU **Type of entity:** University
Aims of the entity: MSCA International Training Network
End date: 21/04/2014 **Duration in hours:** 8 hours

9 Type of training: Course
Training title: Biotechnology for environmental issues
City awarding entity: Evry, France
Awarding entity: Watchfrog **Type of entity:** Innovation and Technology Centres
Aims of the entity: MSCA International Training Network
End date: 18/03/2014 **Duration in hours:** 8 hours

10 Type of training: Course
Training title: Specialized Course on Water Cycle and Human Health
City awarding entity: Nieuwegein, Holland
Awarding entity: KWR Watercycle Research Institute **Type of entity:** R&D Centre
Aims of the entity: MSCA International Training Network
End date: 20/01/2014 **Duration in hours:** 8 hours

11 Type of training: Course
Training title: Recarga artificial de acuíferos en el contexto de una gestión sostenible de los recursos bajo condiciones climáticas cambiantes: aspectos cuantitativos (Artificial recharge of aquifers in the context of a sustainable management of resources under climatic changing conditions: quantitative aspects)
City awarding entity: Barcelona, Spain
Awarding entity: Universitat Politècnica de Catalunya **Type of entity:** University
End date: 16/12/2011 **Duration in hours:** 24 hours

12 Type of training: Course
Training title: Analysis, fate and risks of organic contaminants in river basins under water scarcity
City awarding entity: Valencia, Spain
Awarding entity: University of Valencia **Type of entity:** University
End date: 08/02/2011 **Duration in hours:** 16 hours

Attended advanced, improvement and innovative teacher training and new technology courses and seminars focused on improving teaching

1 Title of course/seminar: Introducció a l'Aprenentatge Basat en Problemes: teoria i pràctica (Introduction to Problem Based Learning: theory and practice)
Goals of the course/seminar: To offer interested teachers a mainly practical and experiential approach to Problem Based Learning methodology and to the different ones application possibilities.
City organizing entity: Girona, Catalonia, Spain
Organising entity: Universitat de Girona **Type of entity:** University
Faculty, institute or centre: Institut de Ciències de l'Educació Josep Pallach (ICE)
Duration in hours: 16 hours



Start-End date: 06/04/2021 - 11/05/2021

Target group profile: This activity is aimed at teachers of the University of Girona and doctoral students who have to aim to learn the Problem Based Learning methodology to apply on the subjects they are teaching.

Provable tasks: Virtual face-to-face introductory sessions: - General introduction to the ABP methodology. Why use ABP? - The role of the tutor - How to write an ABP case - Evaluation of ABP sessions Non - contact work period: - Observation of ABP sessions through the viewing recordings: three ABP sessions which have been previously recorded in the classrooms of the Faculty of Medicine. For an active active observation, each participant will have a rubric assessment that must be answered based on the observation of the students in the videos. This task must be submitted in order to certify the activity. Virtual face-to-face session for sharing and final debate: - The observations made will be analyzed and specific aspects will be discussed referred to the application of the ABP method (difficulties, pros and cons ...), as well as issues that have been generated throughout the workshop. Discussion topics: - Skills that we intend to develop through the ABP: strengths and weaknesses - Different types of ABP. An ABP is possible for different situations and contexts? - Is it necessary, in some cases, a pre-ABP? - Approach to the case - The evaluation - The role of the teacher - Other questions raised by attendees

2 Title of course/seminar: Mòdul formatiu per a professorat de nova incorporació

Goals of the course/seminar: Offer teaching support to doctoral students and teachers who have recently joined the University of Girona

City organizing entity: Girona, Catalonia, Spain

Organising entity: Universitat de Girona

Type of entity: University

Faculty, institute or centre: Institut de Ciències de l'Educació Josep Pallach (ICE)

Duration in hours: 12 hours

Start-End date: 15/03/2021 - 26/03/2021

Target group profile: This activity is aimed at teachers of new or recent incorporation into the University of Girona and doctoral students who have to take their first classes.

Provable tasks: Learning Targets achieved by attending lectures: • structures, resources and teaching tools of the UdG • teaching strategies and resources for teaching at the university • active teaching methodologies used at the UdG

Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
French	A2	A2	A1	A1	A1
Dutch	A2	A2	A2	A2	A2
Italian	B2	B2	B1	B1	A1
English	C1	C2	C1	C1	C2
Catalan	C2	C2	C2	C2	C2
Spanish	C2	C2	C2	C2	C2

Teaching experience



General teaching experience

- 1 Name of the course:** Experimentació en Química Analítica
University degree: Grau en Química
Start date: 01/02/2022
Entity: Universitat de Girona
Faculty, institute or centre: facultat de Ciències

End date: 30/09/2022
Type of entity: University
- 2 Name of the course:** Introducció a l'Experimentació en Química Analítica
University degree: Grau en Química
Start date: 01/02/2022
Entity: Universitat de Girona
Faculty, institute or centre: Facultat de Ciències

End date: 30/09/2022
Type of entity: University
- 3 Type of teaching:** Official teaching
Name of the course: 3103G02089 Pràctiques integrades
Related skills: - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English. - Work in a team contributing to the elaboration of specific and multidisciplinary projects. - Plan and evaluate one's own activity and learning and develop strategies to improve them by applying quality criteria. - Ability to act, generate proposals and make decisions in research and professional activity with ethical and sustainability criteria. - Use and apply in a safe way the instrumentation and experimental methodologies of the discipline. - Identify and understand, at a structural and functional level, the molecular bases of biological structures and processes, their applications and regulatory mechanisms. - Identify and interpret the information contained in databases on molecules with biological activity and apply basic bioinformatics tools. - Identify and understand the basic strategies for the use of biological organisms and activities in biotechnological processes
Professional category: Part Time Associate Professor

Type of programme: Bachelor's degree
Type of subject: Obligatory
University degree: 3103G0215 Grau en Biotecnologia
Course given: 2020/2021
Start date: 01/02/2021
Type of hours/ ECTS credits: Credits
Hours/ECTS credits: 4
Entity: Universitat de Girona
Faculty, institute or centre: Faculty of Sciences
Department: Chemistry Department
City of entity: Girona, Catalonia, Spain
Subject language: Catalan

Type of teaching: Laboratory work
End date: 01/07/2021
Type of entity: University

**4 Type of teaching:** Official teaching**Name of the course:** 3103G02089 Pràctiques integrades**Related skills:** - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English. - Work in a team contributing to the elaboration of specific and multidisciplinary projects. - Plan and evaluate one's own activity and learning and develop strategies to improve them by applying quality criteria. - Ability to act, generate proposals and make decisions in research and professional activity with ethical and sustainability criteria. - Use and apply in a safe way the instrumentation and experimental methodologies of the discipline. - Identify and understand, at a structural and functional level, the molecular bases of biological structures and processes, their applications and regulatory mechanisms. - Identify and interpret the information contained in databases on molecules with biological activity and apply basic bioinformatics tools. - Identify and understand the basic strategies for the use of biological organisms and activities in biotechnological processes**Professional category:** Part Time Associate Professor**Type of programme:** Bachelor's degree**Type of teaching:** Laboratory work**Type of subject:** Obligatory**University degree:** 3103GD115 Doble Titulació Grau en Biologia/ Grau en Biotecnologia**Course given:** 2020/2021**Start date:** 01/02/2021**End date:** 01/07/2021**Type of hours/ ECTS credits:** Credits**Hours/ECTS credits:** 4**Entity:** Universitat de Girona**Type of entity:** University**Faculty, institute or centre:** Faculty of Sciences**Department:** Chemistry Department**City of entity:** Girona, Catalonia, Spain**Subject language:** Catalan**5 Type of teaching:** Official teaching**Name of the course:** 3103G04093 Experimentació en química analítica**Related skills:** - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English. - Plan and evaluate one's own activity and one's own learning and develop strategies to improve them by applying quality criteria. - Ability to act, generate proposals and make decisions in research and professional activity with ethical and sustainability criteria. - Use and apply in a safe way the instrumentation and experimental methodologies of the discipline. - Apply metrological processes to obtain quality information in solving qualitative and quantitative problems related to the**Professional category:** Part Time Associate Professor



identification, characterization and determination of organic and inorganic substances

Type of programme: Bachelor's degree

Type of subject: Obligatory

University degree: 3103G0415 Grau en Química

Course given: 2020/2021

Start date: 01/02/2021

Type of hours/ ECTS credits: Credits

Hours/ECTS credits: 5,95

Entity: Universitat de Girona

Faculty, institute or centre: Faculty of Sciences

Department: Chemistry Department

City of entity: Girona, Catalonia, Spain

Subject language: Catalan

Type of teaching: Laboratory work

End date: 01/07/2021

Type of entity: University

6 **Type of teaching:** Official teaching

Name of the course: 3501MO3086 Qualitat de l'aigua

Related skills: - Pose innovative solutions to new or little known problems in broad or multidisciplinary contexts

-Communicate in an argumentative and clear way in front of specialized and non-specialized audiences

-Possess the learning skills necessary to progress autonomously in the acquisition of knowledge and skills

-To select autonomously the sources and the relevant information, of the own field of knowledge, to answer to some concrete aims

-Facilitate synergy in cooperative work and actively participate in group work -Assess the ecological status of a body of water based on the use of indicators, physicochemical and biological

Type of programme: Bachelor's degree

Type of subject: Optional

University degree: 3103M0118 Màster Universitari en Ciència i Tecnologia dels Recursos Hídrics

Course given: 2020/2021

Start date: 01/10/2020

Type of hours/ ECTS credits: Credits

Hours/ECTS credits: 4

Entity: Universitat de Girona

Faculty, institute or centre: Faculty of Sciences

Department: Chemistry Department

City of entity: Girona, Catalonia, Spain

Subject language: Spanish

Type of teaching: Practical work (classroom-problems)

End date: 01/07/2021

Type of entity: University

7 **Type of teaching:** Official teaching

Name of the course: 3103G00131 Bioanàlisi

Related skills: - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English Work in a team contributing to the elaboration of specific and multidisciplinary projects. - Apply metrological processes to obtain quality information in solving qualitative and

Professional category: Part Time Associate Professor



quantitative problems related to the identification, characterization and determination of organic and inorganic substances

Type of programme: Bachelor's degree

Type of subject: Optional

University degree: 3103G0215 Grau en Biociències

Course given: 2020/2021

Start date: 01/10/2020

Type of hours/ ECTS credits: Credits

Hours/ECTS credits: 1,4

Entity: Universitat de Girona

Faculty, institute or centre: Faculty of Sciences

Department: Chemistry Department

City of entity: Girona, Catalonia, Spain

Subject language: Catalan

Type of teaching: In person theory

End date: 31/01/2021

Type of entity: University

8 **Type of teaching:** Official teaching

Name of the course: 3103G00131 Bioanàlisi

Related skills: - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English Work in a team contributing to the elaboration of specific and multidisciplinary projects. - Apply metrological processes to obtain quality information in solving qualitative and quantitative problems related to the identification, characterization and determination of organic and inorganic substances

Type of programme: Bachelor's degree

Type of subject: Optional

University degree: 3103G0415 Grau en Química

Course given: 2020/2021

Start date: 01/10/2020

Type of hours/ ECTS credits: Credits

Hours/ECTS credits: 1,4

Entity: Universitat de Girona

Faculty, institute or centre: Faculty of Sciences

Department: Chemistry Department

City of entity: Girona, Catalonia, Spain

Subject language: Catalan

Professional category: Part Time Associate Professor

Type of teaching: In person theory

End date: 31/01/2021

Type of entity: University

9 **Type of teaching:** Official teaching

Name of the course: 3103G02083 Pràctiques de mètodes instrumentals quantitius

Related skills: - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English. - Work in a team contributing to the elaboration of specific and multidisciplinary projects. - Plan and evaluate

Professional category: Part Time Associate Professor



one's own activity and one's own learning and develop strategies to improve them by applying quality criteria.
- Use and apply in a safe way the instrumentation and experimental methodologies of the discipline. - Apply metrological processes to obtain quality information in solving qualitative and quantitative problems related to the identification, characterization and determination of organic and inorganic substances

Type of programme: Bachelor's degree

Type of subject: Obligatory

University degree: 3103G0215 Grau en Biociencia

Course given: 2020/2021

Start date: 01/10/2020

Type of hours/ ECTS credits: Credits

Hours/ECTS credits: 5,4

Entity: Universitat de Girona

Faculty, institute or centre: Faculty of Sciences

Department: Chemistry Department

City of entity: Girona, Catalonia, Spain

Subject language: Catalan

Type of teaching: Laboratory work

End date: 31/01/2021

Type of entity: University

10 **Type of teaching:** Official teaching

Name of the course: 3103G02083 Pràctiques de mètodes instrumentals quantitius

Related skills: - Ability to critically analyze from the collection of information and the interpretation of data, complex situations and design creative and innovative strategies to solve them. - Know how to communicate orally and in writing in the scientific and professional field, using their own languages and English. - Work in a team contributing to the elaboration of specific and multidisciplinary projects. - Plan and evaluate one's own activity and one's own learning and develop strategies to improve them by applying quality criteria. - Use and apply in a safe way the instrumentation and experimental methodologies of the discipline. - Apply metrological processes to obtain quality information in solving qualitative and quantitative problems related to the identification, characterization and determination of organic and inorganic substances

Type of programme: Bachelor's degree

Type of subject: Obligatory

University degree: 3103GD115 Doble Titulació Grau en Biologia/ Grau en Biociencia

Course given: 2020/2021

Start date: 01/10/2020

Type of hours/ ECTS credits: Credits

Hours/ECTS credits: 5,4

Entity: Universitat de Girona

Faculty, institute or centre: Faculty of Sciences

Department: Chemistry Department

City of entity: Girona, Catalonia, Spain

Subject language: Catalan

Professional category: Part Time Associate Professor

Type of teaching: Laboratory work

End date: 31/01/2021

Type of entity: University



Experience supervising doctoral thesis and/or final year projects

- 1 Project title:** Comparative analysis of animal manure and human faecal resistomes using metagenomics
Entity: FUNDACIÓ BARCELONA MEDIA UNIVERSITAT POMPEU FABRA
Student: Arnau Sabater Mezquita
Date of reading: 28/06/2022
- 2 Project title:** Development of a sample fractionation procedure suitable for the implementation of an effect-direct analysis approach in water quality assessment
Entity: Universitat de Barcelona **Type of entity:** University
Student: Jhesibel Chávez
- 3 Project title:** EDA approaches for the prioritization of CECs and understanding of their hydrogeochemical fate in urban groundwaters (EDA-for-UGW)
Entity: Ministerio de Ciencia e Innovación **Type of entity:** Agencia Estatal de Investigación
Student: Lyen Marie Castro
- 4 Project title:** Effect Directed Analysis on microbial communities as indicators of chemical and ecotoxicological quality status of the aquatic environment (Pharm-ERA Doctoral Network)
Entity: HORIZON-MSCA-2022-DN-01 MSCA Doctoral Networks 2022 (European Commission) **Type of entity:** European Commission

Other activities/achievements not included above

- 1 Description of the activity:** Lecture about the Effect Directed Analysis, the EDA-EMERGE project included in the program of the Short course in Analytical chemistry technologies for COAST Analytical Sciences Talent Programme is part of the "Topsector Chemieburzenprogramma" (Top sector Chemistry grant program).
Identify key words: Natural environment; Water management; Pollution control measures; Environmental policy
City of activity: Nieuwegein, Utrecht, Holland
Organising entity: KWR Watercycle Research Institute **Type of entity:** R&D Centre
End date: 03/2014
- 2 Description of the activity:** Lecture about the Development of work within the EDA-EMERGE project included in the program of the Specialized Course on Water cycle and Human health (MSCA International Training Network)
Identify key words: Natural environment; Water management; Pollution control measures; Environmental policy
City of activity: Nieuwegein, Utrecht, Holland
Organising entity: KWR Watercycle Research Institute **Type of entity:** R&D Centre
End date: 20/01/2014



Scientific and technological experience

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

- 1** **Name of the project:** HYDROUSA - Demonstration of water loops with innovative regenerative business models for the Mediterranean region
Degree of contribution: Researcher
Entity where project took place: INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA
Type of participation: Team member
Name of the programme: H2020
Start-End date: 2018 - 2023
Total amount: 12.015.449 € **Sub-project amount:** 474.300 €
- 2** **Name of the project:** REST-RESIST
Entity where project took place: INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA
City of entity: Girona, Catalonia, Spain
Name principal investigator (PI, Co-PI...): Victoria (PI) Osorio Torrens; Sara Rodríguez Mozaz; Jose Luís Balcázar
Nº of researchers: 3
Funding entity or bodies: Comisión Europea **Type of entity:** European Union's Horizon 2020 research and innovation programme under the MSCA grant agreement No 801370
Start-End date: 01/04/2021 - 31/12/2022
Total amount: 144,3 €
Applicant's contribution: Role as Principal Investigator. This project faces the challenge of the investigation on AR spread from a "One Health" perspective. REST-RESIST aims to unveil the occurrence, understand the fate, and contribute to mitigate the spread in the total environment of class B antibiotics (B-ABs), their Transformation Products (TPs) and the genes (ARGs) conferring resistance to them by: i) developing quantitative chemical analytical methods combined with bio-molecular tools, both relying on cutting-edge instrumental techniques; ii) identifying routes of potential exposure of B-ABs, their TPs and selective ARGs to human population; iii) delivering critical insights on the role of the misuse of ABs as chronic selective pressure factor of promotion of selective ARGs in the environment; iv) investigating and providing evidences of the capability of the main attenuation processes for the removal and remediation of ABs and selected ARGs. In Europe, REST-RESIST will contribute to scale up the Commission efforts to fight against AR burden. In Spain, where ABs –particularly Colistin– are extensively used in livestock, REST-RESIST findings will provide local management authorities and stakeholders a solid basis to tackle the issue of AR spread from a holistic perspective including all sectors affected.
- 3** **Name of the project:** DEMINE - Decreasing the impacts of abandoned mines
Entity where project took place: Universitat de Vic **Type of entity:** University
Start-End date: 2017 - 2022
Total amount: 2.184.632 €

**4 Name of the project:** PECT-OSONA PECT-Osona-Transformació Social**Identify key words:** Analytic chemistry; Soil analysis; Renewable resources; Animal resources; Pollution from land based sources; Waste management; Agri foodstuffs; Agricultural activity**Identify key words:** Mass spectrometry; Hibrid techniques; Speciation; Others separation techniques; Taking sample; Statistical methods; Methods of optimization and experimental design; Quality/metrology; Atomic fluorescence; Atomic emission; Atomic absorption (faas, etaas); Gas chromatography (fid, ecd, ms, etc); Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Sample screenings; Waste management**Type of project:** Research and development, including transfer**Geographical area:** Regional**Degree of contribution:** Researcher**Entity where project took place:** FUNDACIO UNIVERSITARIA BALMES DE VIC**City of entity:** Vic, Catalonia, Spain**Name principal investigator (PI, Co-PI....):** Sergio Ponsa Salas; Evan Marks; Victoria Osorio Torrens**Nº of researchers:** 3**Type of participation:** Team member**Name of the programme:** Fundació Universitària Balmes-PO FEDER**Start-End date:** 21/01/2019 - 21/01/2021**Duration:** 2 years**Relevant results:** Development and validation of classical and instrumental analytical methods for the quantitative determination of organic and inorganic compounds in complex environmental and engineered samples**Dedication regime:** Full time**Applicant's contribution:** Optimization, validation and quality assurance of instrumental analytical methods applied to the assessment of chemicals in complex environmental samples and residues from anthropogenic activities. - Optimization and validation of analytical methods using Ionic Chromatography coupled to Electrochemical detection for the quantitative determination of nitrates and phosphates in complex solid and liquid matrices from agroindustry or animal manure origin. - Optimization and validation of analytical methods using Gas Chromatography coupled to Thermal conductivity Detector (TCD) for the determination of green-house gas emissions - Optimization and validation of analytical methods using Total organic Carbon Analyzer for the quantitative determination of organic carbon and nitrogen species in solid and liquid matrices from agroindustry or animal manure origin. - Optimization and validation of analytical methods using Atomic Absorption Spectroscopy (and emission) for the quantitative determination of metals in samples from agroindustry or animal manure origin. - Optimization and validation of analytical methods using Elemental Analyzer for the simultaneous determination of carbon, hydrogen and nitrogen species in solid and liquid matrices from agroindustry or animal manure origin**5 Name of the project:** Demostración de la capacidad de eliminación de antibióticos en tecnologías de tratamiento de purines. Elaboración de una guía técnica para el asesoramiento del sector ganadero**Type of project:** Demonstration, pilot projects, conceptual formulations and design of processes and services**Degree of contribution:** Researcher**Entity where project took place:** Universitat de Vic **Type of entity:** University**City of entity:** Vic, Catalonia, Spain**Name principal investigator (PI, Co-PI....):** Sergio Ponsá**Start-End date:** 2018 - 2020**Total amount:** 29.984 €**6 Name of the project:** INTCATCH - Development and application of Novel, Integrated Tools for monitoring and managing Catchments (H2020)**Type of project:** Research and development, including transfer**Entity where project took place:** Universitat de Vic **Type of entity:** University**City of entity:** Vic, Catalonia, Spain**Name principal investigator (PI, Co-PI....):** Mark Schrimshaw**Funding entity or bodies:**



Comisión Europea

Type of entity: Comision Europea

Type of participation: Team member

Name of the programme: H2020

Start-End date: 2016 - 2020

Duration: 4 years

Total amount: 7.570.335 €

Sub-project amount: 286.500 €

7 Name of the project: Mass spectrometry imaging of model biological systems interacting with active molecules

Identify key words: Mass spectrometry; Sample system introduction; Quality/metrology; Automatization and miniaturization; Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Isolation and structural determination; Agro industry; Plant biotechnology; Plant disease

Identify key words: Mass spectrometry; Analytical use of laser; Use of biochemical, microbiological and biological tools; Analysis of biological samples (proteomic); Sample system introduction; Methods of optimization and experimental design; Analytical methods validation; Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Peptides and proteins; Natural products; Soil biology; Crop production

Type of project: Research and development, including transfer

Geographical area: European Union

Degree of contribution: Researcher

Entity where project took place: University of Liège **Type of entity:** University

City of entity: Liège, Belgium

Name principal investigator (PI, Co-PI...): Edwin De Pauw; Victoria Osorio Torrens

Nº of researchers: 2

Nª people/year: 2

Funding entity or bodies:

European Comission FP7-PEOPLE-COFUND-BelPD **Type of entity:** Public Research Body

Type of participation: Principal investigator

Name of the programme: FP7-PEOPLE-COFUND-BelPD

Start-End date: 31/12/2016 - 31/12/2018

Duration: 2 years

Relevant results: Tool for unequivocal identification of the specific isoforms of CLPs produced under different culture conditions by (UPLC-ESI(+)-HRMS/MS). The outcomes allowed selecting the optimal bacteria growth conditions boosting the production of the more bioactive CLPs. With the MALDI-FTICR and LESA-ESI-FTICR methods developed CLPs produced by different bacteria species were identified and their diffusion in the rizosphere zone during their interaction with other microorganisms present (e.g. bacteria, pathogens) could be described.

Dedication regime: Full time

Applicant's contribution: Identification and characterization of chemical structures: - Identification and structural elucidation by Ultrahigh Performance Liquid Chromatography interfaced by an Electrospray Ionization Source to a High Resolution Mass Tandem Spectrometer (UPLCESI(+)-HRMS/MS) of Surfactins produced by *Bacillus amyloliquefaciens* under different microbial culture conditions. - Characterization of fragmentation patterns of the every isoform of surfactin detected in extracts obtained from different bacteria cultures prepared at lab scale and analyzed by UPLC-ESI(+)-HRMS/MS in order to provide a tool for unequivocal identification of the specific metabolites produced under different culture conditions and estimation of their relative abundances among the diverse samples. - Identification of lipopeptides and other metabolites produced during bacteria-bacteria interactions by UPLC-ESI(+)-HRMS/MS. Mass Spectrometry Imaging: - Optimization of instrument conditions for the analysis of surfactins and other metabolites produced in planta by bacteria colonizing plant roots during interaction with a plant pathogen and bacteriabacteria interactions by HRMS Imaging. - Optimization of sample preparation methods for the HRMS Imaging of Surfactins and other metabolites produced by bacteria colonies during microbial interaction using Matrix Assisted Laser Desorption Ionization coupled to a Fourier Transform Ion Cyclotron Resonance analyzer (MALDIFTICR) or applying Liquid Extraction Surface Analysis (LESA) coupled to ESI-FTICR. - Dissemination of results in conferences.



8 Name of the project: EDA-EMERGE Novel tools in effect directed analysis for identifying and monitoring emerging toxicants on a European scale.

Identify key words: Analytic chemistry; Organic chemistry; Waste management; Environmental protection; Pollution control measures; Water management

Identify key words: Mass spectrometry; Use of biochemical, microbiological and biological tools; Owning and treatment sample; Chemometrics; Quality/metrology; Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Pharmaceutics chemistry; Environmental protection; Pollution control measures; Water management

Type of project: Research and development, including transfer

Geographical area: European Union

Degree of contribution: Researcher

Entity where project took place: KWR Watercycle Research Institute

Type of entity: Innovation and Technology Centres

City of entity: Nieuwegein, Utrecht, Holland

Name principal investigator (PI, Co-PI....): Annemieke Kolkman; Merijn Schriks; Victoria Osorio Torrens

Nº of researchers: 3

Nª people/year: 3

Funding entity or bodies:

European Commission (Marie Skłodowska-Curie International Training Network, 7th programme) (FP7-PEOPLE- 2011-ITN, grant agreement number 290100)

Type of participation: Team member

Name of the programme: (Marie Skłodowska-Curie International Training Network, 7th programme) (FP7-PEOPLE- 2011-ITN, grant agreement number 290100)

Code according to the funding entity: 290100

Start-End date: 01/10/2011 - 01/09/2015

Duration: 2 years

Relevant results: Development of a novel sample preparation procedure, relying on SPE combining different sorbent materials on a sequential-based cartridge for the enrichment of widely diverse contaminants of emerging concern from surface waters, for further combined chemical and biological analysis on the same subsequent extract. The procedure was successfully applied to the chemical and ecotoxicological assessment of SW by means of LC-(HR)MS/MS quantitative analysis and in vitro CALUX bioassays (e.g. endocrine and metabolic responses). Given the demonstrated reliability of this sample preparation method, applicable to a broad range of organic CECs, I proposed its integration in an effect-directed analysis procedure in order to improve the monitoring of SW chemical and biological quality status and the identification of key toxicants in the aquatic environment.

Dedication regime: Full time

Applicant's contribution: - Participation in the European Demonstration Program (EDP) consisting on the sampling of large volumes of drinking water, surface water and wastewater effluents from well-known sites of different European river basins with a large volume solid phase extraction (LV-SPE) device. - Development and validation of an analytical procedure based on LC-MS/MS for the analysis of diglyme, triglyme, tetraglyme and aconitine in LV-SPE extracts from drinking water, surface water and wastewater samples collected during the EDP program. - Development and validation of an analytical procedure based on LC-HRMS/MS for the analysis of 20 glucocorticoids in LV-SPE extracts from drinking water, surface water and wastewater samples collected during the EDP program. - Development and validation of an analytical procedure in EDA relying on off-line mixed-bed multi layer SPE for the target analysis of 118 common organic compounds of environmental concern in surface waters and application of extracts for combined LC-HRMS/MS analysis and CALUX bioassays. - Contribution to a Higher-Tier EDA study in collaboration with IVM-VU for the analysis of 118 common organic compounds of environmental concern in surface water samples collected during the EDP program. The potential neurotoxicity of SW samples will be tested by exposure experiments on snails and effects observed will be related with the compounds detected at higher levels. - Compilation of a comprehensive chemical analytical toolbox for extraction, fractionation and structure elucidation in EDA. Coordination and integration of the multiple tool development in WP2 and report of the subsequent deliverable on chemical tools in EDA. - Co-organisation of a Specialized Course on Water Cycle and Human Health in the frame of the hosting institute training activities.



9 Name of the project: SCARCE - Assessing and predicting effects on water quantity and quality in Iberian rivers caused by global change (Consolider-Ingenio CSD2009-00065)

Identify key words: Analytic chemistry; Organic chemistry; Soil analysis; Water resources; Ecosystem; Surface water; Fresh water; Pollution of waterways; Pollution from land based sources; Polluted area; Water treatment; Water analysis; Water protection; Degree of pollution; Hydrology; Quality of the environment; Environmental monitoring; Environmental impact

Identify key words: Mass spectrometry; Hibrid techniques; Use of biochemical, microbiological and biological tools; Analysis of biological samples (proteomic); Others separation techniques; Taking sample; Solid phase extraction; Sample system introduction; Multi-variate methods; Statistical methods; Methods of optimization and experimental design; Reference materials; Quality control; Analytical methods validation; Gas chromatography (fid, ecd, ms, etc); Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Sample screenings; Analides screening; Natural products; Pharmaceutics chemistry; Soil analysis; Water resources; Ecosystem; Water pollution; Pollution from agricultural sources; Chemical pollution; Degradation of the environment; Water treatment; Water analysis; Water protection; Pollution control; Hydrology; Environronmental policy; Environmental science

Type of project: Research and development, including transfer

Geographical area: National

Degree of contribution: Researcher

Entity where project took place: Consejo Superior de Investigaciones Científicas

Type of entity: State agency

City of entity: Barcelona, Catalonia, Spain

Name principal investigator (PI, Co-PI....): Damià Barceló Cullerés; Mira Petrovic; Sandra Pérez Solsona; Victoria Osorio Torrens

Nº of researchers: 4

Funding entity or bodies:

Ministerio de Ciencia e Innovación

Type of entity: State agency

City funding entity: Spain

Type of participation: Team member

Start-End date: 17/12/2009 - 16/12/2014

Duration: 4 years

Relevant results: Characterization of Iberian river basins in terms of pharmaceuticals pollution and associated ecotoxicological effects and its relationship with anthropogenic pressures.

Dedication regime: Full time

Applicant's contribution: - Collection and treatment (i.e. SPE and pressurized liquid extraction, PLE) of river surface water, wastewater, particulate matter and sediment samples. LC-MS/MS analysis of 76 pharmaceuticals in samples collected. - Application of statistical tools to study the fate of the pharmaceuticals analyzed along the River Basins studied. - Environmental risk assessment of the pharmaceuticals determined in surface waters on non-target aquatic organisms (i.e. algae, Daphnia Magna and fish). - Study of fate and behavior of pharmaceuticals during the wastewater treatment relying on conventional activated sludge. - Development and validation of an analytical procedure relying on off-line mono-bed SPE followed by LC-MS/MS for the target analysis of diclofenac, sulfametoxazole and their transformation products in wastewaters and surface waters. - Performance of lab scale biodegradation experiments in activated sludge to elucidate unknown biotransformation products and reaction mechanisms of diclofenac and other analgesics with related chemical structures. - Contribution to project reports and databases. - Dissemination of results in seminars and conferences.

10 Name of the project: VIECO - Desarrollo y validación de plataformas integradas de vigilancia biológica y química optimizadas económicamente (VIECO). (Development and validation of integrated platforms of economically optimized chemical and biological monitoring) (2008 009/RN08/011)

Identify key words: Physics chemical and mathematical; Pollution; Water management; Environmental protection; Hydrology; Environmental policy; Biological sciences; Environmental science

Identify key words: Analytic chemistry; Water resources; Ecosystem; Aquatic environment; Water pollution; Pollution from land based sources; Polluted area; Water requirements; Water treatment; Water analysis; Pollution control; Hydrology; Waste management; Environmental policy; Environmental science

Geographical area: National



Type of project: Research and development, including transfer

Degree of contribution: Researcher

Entity where project took place: Consejo Superior de Investigaciones Científicas

Type of entity: State agency

City of entity: Barcelona, Catalonia, Spain

Name principal investigator (PI, Co-PI....): Damià Barceló Cullerès; Sandra Pérez Solsona; Victoria Osorio Torrens

Nº of researchers: 3

Funding entity or bodies:

Ministerio de Medio Ambiente, Medio Rural y Medio Marino

Type of entity: State agency

City funding entity: Spain

Type of participation: Team member

Start-End date: 01/01/2007 - 31/12/2010

Duration: 3 years - 11 months - 30 days

Relevant results: Spatial and temporal assessment of pharmaceuticals pollution in a Mediterranean River basin and assessment of their associated ecotoxicological effects. Assessment of relationships between levels of pharmaceuticals and associated ecotoxicological effects with variation of hydrological conditions in the river.

Dedication regime: Full time

Applicant's contribution: VIECO project aimed to develop and validate a cost-effective integrated platform for biological and chemical monitoring in freshwater bodies to facilitate the Water Framework Directive (WFD) implementation. - Collection and treatment (i.e. solid phase extraction, SPE) of river surface water samples. - LC-MS/MS analysis of 73 pharmaceuticals in samples collected. - Application of modelling approaches and statistical tools to study the fate of the pharmaceuticals analyzed along the catchment studied. Assessment of the effects of multiple stressors (i.e. pharmaceuticals and hydrology) on microbiological attached communities (i.e. biofilms) in the river studied. - Contribution to project reports. - Dissemination of results in seminars and conferences.

11 Name of the project: MODELKEY Models for Assessing and Forecasting the Impact of Environmental Key Pollutants on Marine and Freshwater Ecosystems and Biodiversity

Degree of contribution: Researcher

Entity where project took place: INSTITUTO DE DIAGNOSTICO AMBIENTAL Y ESTUDIOS DEL AGUA

Type of entity: State agency

City of entity: Barcelona, Catalonia, Spain

Name principal investigator (PI, Co-PI....): Werner Brack

Funding entity or bodies:

Comisión Europea

Type of entity: Comision Europea

Start-End date: 01/02/2005 - 31/01/2010

Total amount: 12.308.366 €

12 Name of the project: KEYBIOEFFECTS - Cause-effect Relations of Key Pollutants on the European Rivers Biodiversity

Entity where project took place: INSTITUTO DE DIAGNOSTICO AMBIENTAL Y ESTUDIOS DEL AGUA

Type of entity: State agency

City of entity: Barcelona, Catalonia, Spain

Name principal investigator (PI, Co-PI....): Helena Guasch

Funding entity or bodies:

Comisión Europea

Type of entity: EU

Start-End date: 2007 - 2010

Duration: 3 years



13 Name of the project: Pharm-ERA: Improving monitoring and environmental risk assessment of pharmaceuticals, antimicrobial resistance and pathogens from terrestrial to aquatic environments

Type of project: Research and development, including transfer

Degree of contribution: Researcher

Entity where project took place: IDAEA-CSIC

Type of participation: Principal investigator

Name of the programme: HORIZON-MSCA-2022-DN-01-01

Start date: 01/02/2024

Duration: 48 months

Applicant's contribution: Supervision of PhD thesis project: "Effect Directed Analysis on microbial communities as indicators of chemical and ecotoxicological quality status of the aquatic environment". Objectives O1 -Develop an EDA workflow dedicated to microbial communities exposed to complex environmental samples containing PhACs (surface water and wastewater effluent) including sample preparation, design of biotesting strategy, fractionation strategy and further combination with chemical target and suspect analyses. O2 – Validate EDA procedures using periphyton in mesocosms and in the field. Implementation (1) Microcosm exposure of periphyton to reconstituted mixture of relevant environmental xenobiotic containing PhACs presenting the broadest range of polarity: (i) adaptation and development of fractionation methods relying on solid phase extraction (SPE) and/or HPLC; (ii) periphyton bioassays focusing on classical endpoints (e.g. respiration, enzymatic and photosynthetic activity) and innovative approach cutting-edge metabolomics based on high resolution mass spectrometry (LC-HRMS/MS); (iii) definition of QA/QC procedure for the developed EDA workflow (O1). (2) Application of the EDA workflow in mesocosm and field experiment (O2). (3) Comparative analysis of the sensitivity of measured responses will be performed by Application of the EDA procedure to single organisms (i.e. selected species of bacteria and algae) for comparative sensitivity analysis. Expected Results (1) A powerful innovative tool applied in ERA strategies for assessment of chemical and ecological status of the aquatic environment, based on the principles of EDA and using microbial communities as target bioassays; (2) First proof of concept for the implementation of omics analyses in EDA-based using microbial communities ERA Contribution to Work Package 4 "Effect assessment of PhACs on the environment: from molecular to community responses" which objective is to assess ecotoxicological effects of PhACs and their TPs on ecosystems along the soil-water-sediment continuum taking into account effects at different levels of biological organisation from molecular early responses to community effects. I will particularly contribute to task 4.1 Assess PhACs and associated TPs effects on organisms along the soil-water-sediment continuum. Exposure of microbial communities to selected PhACs and/or associated TPs to measure key microbial functions in periphyton (self-depuration capacity, organic matter processing, primary production, respiration and/or (de)nitrification; 4.3 Development and implementation of omics approach to investigate PhACs effects at molecular levels in periphyton. Develop and validate workflow for (iii) the implementation of omics analyses in EDA-based approach; and task 4.4 Determine the influence of confounding factors on microbial response to PhACs and associated TPs exposure. Comparison of microbial responses after exposure to PhACs in complex mixture (periphyton). Contribution to Work Package 5 "Innovative tools & approaches for environmental risk assessment of PhACs" which objective is to develop tools and strategies to improve ERA of PhACs and TPs in soils, surface water and sediments. I will particularly contribute to task 5.2 Provide an EDA-based diagnostic approach to identify most toxic compounds for microbial communities in complex mixtures. Develop and quality assess a fractionation method to isolate and identify PhAC and TP compounds toxic for periphyton within mixtures of increasing complexities. Collaboration with N. Corcoll (UGOT) in PhD project "Fate and effects of the antibiotic sulfamethoxazole on sediment microbial communities: influence of availability of natural organic carbon" by supervising the PhD fellow's secondment at IDAEA on the specific tasks: (i) Quantification of SMX in water and sediment samples produced in field and lab-based studies; and (ii) Identification, structural elucidation and semi-quantification of SMX T...

**R&D non-competitive contracts, agreements or projects with public or private entities**

- 1** **Name of the project:** Estudio del ciclo del agua en explotaciones ganaderas porcinas y desarrollo de nuevos métodos de reutilización
Degree of contribution: Researcher
Name principal investigator (PI, Co-PI....): Sergio Ponsá
Funding entity or bodies:
Granges Terragrisa SLU **Type of entity:** Business
City funding entity: Tona, Catalonia, Spain
Start date: 2019 **Duration:** 3 years
Total amount: 59.850 €
- 2** **Name of the project:** Optimización del funcionamiento de la planta de tratamiento de purines de Deseuras y propuestas de mejora
Degree of contribution: Researcher
Funding entity or bodies:
Seleccio Deseuras SL **Type of entity:** Business
City funding entity: Vilanova de SAu, Catalonia, Spain
Start date: 2019 **Duration:** 2 years
Total amount: 11.000 €
- 3** **Name of the project:** Estudio de la presencia de COEs de origen veterinario en purines, suelos agrícolas, lixiviados y cereal
Degree of contribution: Researcher
Name principal investigator (PI, Co-PI....): Sergio Ponsá
Funding entity or bodies:
Granges Terragrisa SLU
Start date: 2018 **Duration:** 1 year - 6 months
Total amount: 41.000 €
- 4** **Name of the project:** Estudio y evaluación de la formación de Geosmina a la Cuenca alta del río Ter
Degree of contribution: Researcher
Name principal investigator (PI, Co-PI....): Lorenzo Proia
Funding entity or bodies:
Aigues de Osona **Type of entity:** Business
Aigues de Vic **Type of entity:** Business
City funding entity: Vic, Catalonia, Spain
Start date: 2017 **Duration:** 3 years
Total amount: 42.000 €



Scientific and technological activities

Scientific production

H index: 16

Date of application: 11/04/2023

Fuente de Índice H: H index

Publications, scientific and technical documents

- 1** Victoria Osorio; Sabater i Mezquita, A; Balcazar, JL. Comparative metagenomics reveals poultry and swine farming are hotspots for multidrug and tetracycline resistance. *Environmental Pollution*. Elsevier, 10/02/2023. Available on-line at: <<https://www.sciencedirect.com/science/article/pii/S0269749123002415?via%3Dihub>>.

Type of production: Scientific paper

Format: Journal

Corresponding author: Yes

Impact source: SCOPUS

Category: Environmental Science

Impact index in year of publication: 9.988

Journal in the top 25%: Yes

Relevant results: Antibiotic misuse in livestock is a major threat to human health, as bacteria are quickly developing resistance to them. We performed a comparative analysis of 25 faecal metagenomes from swine, poultry, cattle, and humans to investigate their resistance profiles. Our analysis revealed that all genes conferring resistance to antibiotic classes assessed except tetracyclines were more prevalent in poultry manure than in the remaining species. We detected clinically relevant antibiotic resistance genes, such as *mcr-1* which confers resistance to polymyxins. Among them, extended-spectrum β -lactamase *bla*CTX-M genes were particularly abundant in all species. Poultry manure was identified as a hotspot for multidrug resistance, which may compromise medical treatment options. Urgent actions in the livestock industry are imperative to hamper the emergence and spread of antibiotic resistance.

Relevant publication: Yes

- 2** Vendrell-Puigmitja; Proia; Espinosa; Barral-Fraga; Cañedo-Argüelles; Osorio; Casas; Llenas; Abril. Hypersaline mining effluents affect the structure and function of stream biofilm. *Science of the Total Environment*. 843, Elsevier, 25/06/2022.

Type of production: Scientific paper

Format: Journal

Corresponding author: No

Impact source: SCOPUS

Category: Environmental Science

Impact index in year of publication: 10,754

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 2

Relevant results: EDA is a combination of bioassay, sequential fractionation to reduce sample complexity, and subsequent analytical identification of toxicants in active fractions. The experimental settings of the EDA procedure will be optimized and tested using aquatic organisms (e.g. daphnia, algae or biofilms) as target of a selected battery of bioassays at lab-scale microcosms and synthetic mixtures of selected relevant contaminants of emerging concern (CECs). - The fellow will design and optimize the appropriate experimental suitable to perform and EDA approach: - (i) Optimization of the experimental settings according to the fractionation protocols to apply, by adapting methods previously described in the research group. (ii) The fractionation protocol will be adapted according to all the endpoints selected to allow minimum required sensitivity to measure specific responses on aquatic organisms exposed. (iii) Water spiked with reconstituted mixture of relevant environmental CECs will be used for method development. (iv) Fractions will be then tested on the aquatic organisms according to selected set of endpoints. (v) Target analysis of model CECs will be performed on bioactive fractions by LC-HRMS/MS. (vi) Measured bioassay responses and chemical analysis will be used to evaluate the performance of the optimized

protocol. After methodological development, the EDA workflow will be validated in mesocosms at lab-scale exposing aquatic organisms to field water samples from upstream and downstream a wastewater effluent (WWE) discharge point in a river and performing suspect screening on extracts to identify sub-mixtures of CECs drivers of the toxicity in the bioactive fractions.

Relevant publication: Yes

- 3** Hoff; Arguelles Arias; Boubsi; Persic; Meyer; Ibrahim; Steels; Luzuriaga; Legras; Franzil; Lequart-Pillon; Rayon; Osorio; de Pauw; Lara; Deboever; de Coninck; Jacques; Deleu; Petit; Van Wuytswinkel; Ongena. Surfactin Stimulated by Pectin Molecular Patterns and Root Exudates Acts as a Key Driver of the Bacillus-Plant Mutualistic Interaction. *mBio*. 12 - 6, American Society for Microbiology, 02/11/2021.

Type of production: Scientific paper

Format: Journal

Corresponding author: No

Impact source: SCOPUS

Category: Microbiology

Impact index in year of publication: 7.786

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 11

Relevant results: *Bacillus velezensis* is considered as a model species belonging to the so-called *Bacillus subtilis* complex that evolved typically to dwell in the soil rhizosphere niche and establish an intimate association with plant roots. This bacterium provides protection to its natural host against diseases and represents one of the most promising biocontrol agents. However, the molecular basis of the cross talk that this bacterium establishes with its natural host has been poorly investigated. We show here that these plant-associated bacteria have evolved a polymer-sensing system to perceive their host and that, in response, they increase the production of the surfactin-type lipopeptide. Furthermore, we demonstrate that surfactin synthesis is favored upon growth on root exudates and that this lipopeptide is a key component used by the bacterium to optimize biofilm formation, motility, and early root colonization. In this specific nutritional context, the bacterium also modulates qualitatively the pattern of surfactin homologues coproduced in planta and forms mainly variants that are the most active at triggering plant immunity. Surfactin represents a shared good as it reinforces the defensive capacity of the host.

Relevant publication: Yes

- 4** Victoria Osorio Torrens; Cruz Alcalde; Perez Solsona. Nitrosation and nitration of diclofenac and structurally related nonsteroidal anti-inflammatory drugs (NSAIDs) in nitrifying activated sludge. *Science of the Total Environment*. 807 - 1, Elsevier, 29/09/2021.

Type of production: Scientific paper

Format: Journal

Corresponding author: Yes

Impact source: SCOPUS

Category: Science Edition - ENVIRONMENTAL SCIENCES

Impact index in year of publication: 10.754

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 4

Relevant results: Diclofenac (DCF) is a highly consumed non-steroidal anti-inflammatory drug that is excreted partially metabolized and is poorly removed during wastewater treatment. Previous findings demonstrated that DCF in wastewater treatment plants (WWTP) is partially removed to nitro/nitroso compounds. The reactive nitrogen species, that are microbially produced during nitrification in the activated sludge of WWTP, were suspected to be involved in the transformation of DCF. Therefore, here, we investigated the molecular features governing such biotransformation and the role played by nitrifying bacteria by biodegradation experiments at lab scale in enriched nitrifying sludge bioreactors spiked with DCF and other structurally related non-steroidal anti-inflammatory drugs (NSAIDs). We provided evidence of the incorporation of NO/NO₂ groups into DCF originated from ammonia by isotopically labelled biodegradation experiments. Nitroso and nitro-derivatives were tentatively identified for all NSAIDs studied and biotransformation mechanisms were proposed. Our findings from biodegradation experiments performed under different incubation conditions suggested that biotransformation of DCF and its related NSAIDs might not only be microbially mediated by ammonia oxidizing bacteria, but other nitrifiers co-occurring in the activated sludge as ammonia oxidizing archaea and nitrite oxidizing bacteria. Follow-up studies should be conducted to disentangle such complex behaviour in order to improve removal of these contaminants in WWTPs.

Relevant publication: Yes



- 5 Victoria Osorio; Merijn Schriks; Dennis Vughs; Pim de Voogt; Annemieke Kolkman. A novel sample preparation procedure for effect-directed analysis of micro-contaminants of emerging concern in surface waters. *Talanta*. 186, pp. 527 - 537. 2018. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0039914018304132>>. ISSN 0039-9140

Type of production: Scientific paper

Format: Journal

Position of signature: 1

Total no. authors: 5

Corresponding author: Yes

Impact source: ISI

Category: Analytical Chemistry

Impact index in year of publication: 4.244

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 12

Relevant results: A novel sample preparation procedure relying on Solid Phase Extraction (SPE) combining different sorbent materials on a sequential-based cartridge was optimized and validated for the enrichment of 117 widely diverse contaminants of emerging concern (CECs) from surface waters (SW) and further combined chemical and biological analysis on subsequent extracts. A liquid chromatography coupled to high resolution tandem mass spectrometry LC-(HR)MS/MS protocol was optimized and validated for the quantitative analysis of organic CECs in SW extracts. A battery of in vitro CALUX bioassays for the assessment of endocrine, metabolic and genotoxic interference and oxidative stress were performed on the same SW extracts. Satisfactory recoveries ([70–130]%) and precision (< 30%) were obtained for the majority of compounds tested. Internal standard calibration curves used for quantification of CECs, achieved the linearity criteria ($r_2 > 0.99$) over three orders of magnitude. Instrumental limits of detection and method limits of quantification were of [1–96] pg injected and [0.1–58] ng/L, respectively; while corresponding intra-day and inter-day precision did not exceed 11% and 20%. The developed procedure was successfully applied for the combined chemical and toxicological assessment of SW intended for drinking water supply. Levels of compounds varied from < 10 ng/L to < 500 ng/L. Endocrine (i.e. estrogenic and anti-androgenic) and metabolic interference responses were observed. Given the demonstrated reliability of the validated sample preparation method, the authors propose its integration in an effect-directed analysis procedure for a proper evaluation of SW quality and hazard assessment of CECs.

Relevant publication: Yes

- 6 Zuzana Tousova; Peter Oswald; Jaroslav Slobodnik; Ludek Blaha; Melis Muz; Meng Hu; Werner Brack; Martin Krauss; Carolina Di Paolo; Zsolt Tarcai; Thomas-Benjamin Seiler; Henner Hollert; Sanja Koprivica; Marijan Ahel; Jennifer E. Schollée; Juliane Hollender; Marc J.-F. Suter; Anita O. Hidasi; Kristin Schirmer; Manoj Sonavane; Selim Ait-Aissa; Nicolas Creusot; Francois Brion; Jean Froment; Ana Catarina Almeida; Kevin Thomas; Knut Erik Tollefsen; Sara Tufi; Xiyu Ouyang; Pim Leonards; Marja Lamoree; Victoria Osorio Torrens; Annemieke Kolkman; Merijn Schriks; Petra Spirhanzlova; Andrew Tindall; Tobias Schulze. European demonstration program on the effect-based and chemical identification and monitoring of organic pollutants in European surface waters. *Science of The Total Environment*. 601-602, pp. 1849 - 1868. 2017. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969717314365>>. ISSN 0048-9697

Type of production: Scientific paper

Format: Journal

Corresponding author: No

Impact source: SCOPUS

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 4.900

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 47

Relevant results: Growing concern about the adverse environmental and human health effects of a wide range of micropollutants requires the development of novel tools and approaches to enable holistic monitoring of their occurrence, fate and effects in the aquatic environment. A European-wide demonstration program (EDP) for effect-based monitoring of micropollutants in surface waters was carried out within the Marie Curie Initial Training Network EDA-EMERGE. The main objectives of the EDP were to apply a simplified protocol for effect-directed analysis, to link biological effects to target compounds and to estimate their risk to aquatic biota. Onsite large volume solid phase extraction of 50 L of surface water was performed at 18 sampling sites in four European river basins. Extracts were subjected to effect-based analysis (toxicity to algae, fish embryo toxicity, neurotoxicity, (anti-)estrogenicity, (anti-)androgenicity, glucocorticoid activity and thyroid activity), to target analysis (151 organic micropollutants) and to nontarget screening. The most pronounced effects were estrogenicity, toxicity to algae



and fish embryo toxicity. In most bioassays, major portions of the observed effects could not be explained by target compounds, especially in case of androgenicity, glucocorticoid activity and fish embryo toxicity. Estrone and nonylphenoxyacetic acid were identified as the strongest contributors to estrogenicity, while herbicides, with a minor contribution from other micropollutants, were linked to the observed toxicity to algae. Fipronil and nonylphenol were partially responsible for the fish embryo toxicity. Within the EDP, 21 target compounds were prioritized on the basis of their frequency and extent of exceedance of predicted no effect concentrations. The EDP priority list included 6 compounds, which are already addressed by European legislation, and 15 micropollutants that may be important for future monitoring of surface waters. The study presents a novel simplified protocol for effect-based monitoring and draws a comprehensive picture of the surface water status across Europe.

Relevant publication: Yes

- 7** Victoria Osorio; Aitor Larrañaga; Jaume Aceña; Sandra Pérez; Damià Barceló. Concentration and risk of pharmaceuticals in freshwater systems are related to the population density and the livestock units in Iberian Rivers. *Science of The Total Environment*. 540, pp. 267 - 277. 2016. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969715303351>>. ISSN 0048-9697

Type of production: Scientific paper

Position of signature: 1

Total no. authors: 5

Impact source: ISI

Impact index in year of publication: 4.900

Source of citations: SCOPUS

Format: Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Corresponding author: No

Category: Environmental Science (miscellaneous)

Journal in the top 25%: Yes

Citations: 132

Relevant results: Considerable amounts of pharmaceuticals are used in human and veterinary medicine, which are not efficiently removed during wastewater and slurries treatment and subsequently entering continuously into freshwater systems. The intrinsic biological activity of these non-regulated pollutants turns their presence in the aquatic environment into an ecological matter of concern. We present the first quantitative study relating the presence of pharmaceuticals and their predicted ecotoxicological effects with human population and livestock units. Four representative Iberian River basins (Spain) were studied: Llobregat, Ebro, Júcar and Guadalquivir. The levels of pharmaceuticals were determined in surface water and sediment samples collected from 77 locations along their stream networks. Predicted total toxic units to algae, Daphnia and fish were estimated for pharmaceuticals detected in surface waters. The use of chemometrics enabled the study of pharmaceuticals for: their spatial distribution along the rivers in two consecutive years; their potential ecotoxicological risk to aquatic organisms; and the relationships among their occurrence and predicted ecotoxicity with human population and animal farming pressure. The Llobregat and the Ebro River basins were characterized as the most polluted and at highest ecotoxicological risk, followed by Júcar and Guadalquivir. No significant acute risks of pharmaceuticals to aquatic organisms were observed. However potential chronic ecotoxicological effects on algae could be expected at two hot spots of pharmaceuticals pollution identified in the Llobregat and Ebro basins. Analgesics/antiinflammatories, antibiotics and diuretics were the most relevant therapeutic groups across the four river basins. Among them, hydrochlorothiazide and gemfibrozil, as well as azithromycin and ibuprofen were widely spread and concentrated pharmaceuticals in surface waters and sediments, respectively. Regarding their predicted ecotoxicity, sertraline, gemfibrozil and loratidine were identified as the more concerning compounds. Significantly positive relationships were found among levels of pharmaceuticals and toxic units and population density and livestock units in both surface water and sediment matrices.

Relevant publication: Yes

- 8** Victoria Osorio; Josep Sanchís; Jose Luís Abad; Antoni Ginebreda; Marinella Farré; Sandra Pérez; Damià Barceló. Investigating the formation and toxicity of nitrogen transformation products of diclofenac and sulfamethoxazole in wastewater treatment plants. *Journal of Hazardous Materials*. 309, pp. 157 - 164. 2016. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S030438941630125X>>. ISSN 0304-3894

Type of production: Scientific paper

Position of signature: 1

Total no. authors: 5

Impact source: ISI

Format: Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Corresponding author: No

Category: Environmental Science (miscellaneous)

**Impact index in year of publication:** 6.065**Journal in the top 25%:** Yes**Source of citations:** SCOPUS**Citations:** 68

Relevant results: Diclofenac (DCF) and sulfamethoxazole (SMX) are highly consumed pharmaceuticals and concentrated in effluents from conventional wastewater treatment plants (WWTPs) since they are not completely eliminated. Under microbial mediated nitrification/denitrification processes occurring in nitrifying activated sludge DCF biotransformed into its nitroso and nitro derivatives (NO-DCF and NO₂-DCF, respectively). SMX was biotransformed under denitrification conditions in water/sediment batch reactors into its nitro and desamino derivatives (NO₂-SMX and Des-SMX, respectively). Four transformation products (TPs) from DCF and SMX were analyzed in wastewaters (WW) and receiving surface waters (SW). Nitrifying/denitrifying-derivatives of DCF and SMX were detected for the first time in WW and SW at one order of magnitude lower than their parent compounds. Relationships observed among levels of NO-DCF, NO₂-DCF and nitrogen-species tentatively suggested that nitrification/denitrification processes are involved in nitration and nitrosation of DCF during biological WW treatment. Acute toxicity of analytes to *Daphnia magna* and *Vibrio fischeri* was assessed individually and in mixtures with other relevant micropollutants. Individual effects showed these compounds as not harmful and not toxic. However, synergism effects observed in mixtures evidenced that contribution of these compounds to overall toxicity of complex environmental samples, should not be dismissed.

Relevant publication: Yes

- 9 Sara Tufi; Pim N. H. Wassenaar; Victoria Osorio; Jacob de Boer; Pim E. G. Leonards; Marja H. Lamoree. Pesticide Mixture Toxicity in Surface Water Extracts in Snails (*Lymnaea stagnalis*) by an in Vitro Acetylcholinesterase Inhibition Assay and Metabolomics. *Environmental Science & Technology*. 50 - 7, pp. 3937 - 3944. 2016. Available on-line at: <<https://doi.org/10.1021/acs.est.5b04577>>. ISSN 0013936X

DOI: 10.1021/acs.est.5b04577**Type of production:** Scientific paper**Format:** Journal**Position of signature:** 3**Degree of contribution:** Author or co-author of article in journal with external admissions assessment committee**Total no. authors:** 6**Corresponding author:** No**Impact source:** ISI**Category:** Environmental Science (miscellaneous)**Impact index in year of publication:** 6.198**Journal in the top 25%:** Yes**Source of citations:** SCOPUS**Citations:** 31

Relevant results: Many chemicals in use end up in the aquatic environment. The toxicity of water samples can be tested with bioassays, but a metabolomic approach has the advantage that multiple end points can be measured simultaneously and the affected metabolic pathways can be revealed. A current challenge in metabolomics is the study of mixture effects. This study aims at investigating the toxicity of an environmental extract and its most abundant chemicals identified by target chemical analysis of >100 organic micropollutants and effect-directed analysis (EDA) using the acetylcholinesterase (AChE) bioassay and metabolomics. Surface water from an agricultural area was sampled with a large volume solid phase extraction (LVSPE) device using three cartridges containing neutral, anionic, and cationic sorbents able to trap several pollutants classes like pharmaceuticals, pesticides, PAHs, PCBs, and perfluorinated surfactants. Targeted chemical analysis and AChE bioassay were performed on the cartridge extracts. The extract of the neutral sorbent cartridge contained most of the targeted chemicals, mainly imidacloprid, thiacloprid, and pirimicarb, and was the most potent AChE inhibitor. Using an EDA approach, other AChE inhibiting candidates were identified in the neutral extract, such as carbendazim and esprocarb. Additionally, a metabolomics experiment on the central nervous system (CNS) of the freshwater snail *Lymnaea stagnalis* was conducted. The snails were exposed to the extract, the three most abundant chemicals individually, and a mixture of these. The extract disturbed more metabolic pathways than the three most abundant chemicals individually, indicating the contribution of other chemicals. Most pathways perturbed by the extract exposure overlapped with those related to exposure to neonicotinoids, like the polyamine metabolism involved in CNS injuries. Metabolomics for the straightforward comparison between a complex mixture and single compound toxicity is still challenging but, compared to traditional biotesting, is a promising tool due to its increased sensitivity.

Relevant publication: Yes

- 10** Claudia Rivetti; Bruno Campos; Melissa Faria; Nuria De Castro Català; Amrita Malik; Isabel Muñoz; Romà Tauler; Amadeu M.V.M. Soares; Victoria Osorio; Sandra Pérez; Marina Gorga; Mira Petrovic; Nicola Mastroianni; Miren López de Alda; Ana Masiá; Julian Campo; Yolanda Picó; Helena Guasc; Damià Barceló; Carlos Barata. Transcriptomic, biochemical and individual markers in transplanted *Daphnia magna* to characterize impacts in the field. *Science of The Total Environment*. 503-504, pp. 200 - 212. 2015. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969714009139>>. ISSN 0048-9697

Type of production: Scientific paper

Format: Journal

Position of signature: 9

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 20

Corresponding author: No

Impact source: ISI

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 3.978

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 13

Relevant results: *Daphnia magna* individuals were transplanted across 12 sites from three Spanish river basins (Llobregat, Ebro, Jucar) showing different sources of pollution. Gene transcription, feeding and biochemical responses in the field were assessed and compared with those obtained in re-constituted water treatments spiked with organic eluates obtained from water samples collected at the same locations and sampling periods. Up to 166 trace contaminants were detected in water and classified by their mode of action into 45 groups that included metals, pharmaceuticals, pesticides, illicit drugs, and other industrial compounds. Physicochemical water parameters differentiated the three river basins with Llobregat having the highest levels of conductivity, metals and pharmaceuticals, followed by Ebro, whereas the Jucar river had the greatest levels of illicit drugs. *D. magna* grazing rates and cholinesterase activity responded similarly than the diversity of riparian benthic communities. Transcription patterns of 13 different genes encoding for general stress, metabolism and energy processes, molting and xenobiotic transporters corroborate phenotypic responses differentiated sites within and across river basins. Principal Component Analysis and Partial Least Square Projections to Latent Structures regression analyses indicated that measured in situ responses of most genes and biomarkers and that of benthic macroinvertebrate diversity indexes were affected by distinct environmental factors. Conductivity, suspended solids and fungicides were negatively related with the diversity of macroinvertebrates cholinesterase, and feeding responses. Gene transcripts of heat shock protein and metallothionein were positively related with 11 classes of organic contaminants and 6 metals. Gene transcripts related with signaling paths of molting and reproduction, sugar, protein and xenobiotic metabolism responded similarly in field and lab exposures and were related with high residue concentrations of analgesics, diuretics, psychiatric drugs, β blockers, illicit drugs, trizoles, bisphenol A, caffeine and pesticides. These results indicate that application of omic technologies in the field is a promising subject in water management.

Relevant publication: Yes

- 11** Victoria Osorio; Lorenzo Proia; Marta Ricart; Sandra Pérez; Antoni Ginebreda; Jose Luís Cortina; Sergi Sabater; Damià Barceló. Hydrological variation modulates pharmaceutical levels and biofilm responses in a Mediterranean river. *Science of The Total Environment*. 472, pp. 1052 - 1061. 2014. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969713013521>>. ISSN 0048-9697

Type of production: Scientific paper

Format: Journal

Position of signature: 1

Total no. authors: 8

Impact source: ISI

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 4.099

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 28

Relevant results: The Llobregat is a Mediterranean river that is severely impacted by anthropogenic pressures. It is characterized by high flow variability which modulates its chemical and biological status. The present work evaluates the effects of flow changes on the concentration of pharmaceutically active compounds (PhACs) and their relationship to cellular parameters of river biofilms. To this end, at two selected sampling sites at the lower course of the Llobregat river, surface water samples were collected twice a week over two hydrologically different periods exhibiting low and high river flows. Higher levels of PhACs were detected at the downstream sampling site. Irrespective of the flow regime, analgesics, anti-inflammatories and lipid regulators were the most

abundant substances at both sampling sites with total concentrations of up to 1000. ng/L and 550. ng/L at the upstream and downstream sites, respectively. Antibiotics (fluoroquinolones) and psychiatric treatment drugs were also detected at high levels in the second campaign achieving concentrations of up to 500. ng/L. The principal component analysis (PCA) performed with the PhACs concentrations of the two campaigns revealed differences in the various therapeutic groups depending on sampling site and period. After a flash flood event during the second sampling period, dilution of PhACs occurred, but their average concentrations measured before the flood were restored within two weeks. For the majority of compounds, PhAC concentrations displayed an inverse relationship with river discharge. The effects of water containing different concentrations of PhACs on biofilm communities were evaluated and related to flow regime variations. Translocation of biofilm communities from a less to a more polluted site of the river demonstrated an increase in bacteria mortality in the translocated biofilms. After the flood, extracellular peptidase activity and chlorophyll- a concentration were significantly reduced, and biofilm growth rate was significantly lower.

Relevant publication: Yes

- 12** I. Michael; A. Achilleos; D. Lambropoulou; V. Osorio Torrens; S. Pérez; M. Petrović; D. Barceló; D. Fatta-Kassinos. Proposed transformation pathway and evolution profile of diclofenac and ibuprofen transformation products during (sono)photocatalysis. *Applied Catalysis B: Environmental*. 147, pp. 1015 - 1027. 2014. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0926337313006607>>. ISSN 0926-3373

Type of production: Scientific paper

Position of signature: 4

Total no. authors: 8

Impact source: ISI

Impact index in year of publication: 6.007

Source of citations: ScienceDirect

Format: Journal

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Corresponding author: No

Category: Environmental Science (miscellaneous)

Journal in the top 25%: Yes

Citations: 113

Relevant results: Liquid chromatography time-of-flight mass spectrometry (UPLC/ESI-QToF-MS) was used for the elucidation of the main transformation products (TPs) resulting from the degradation of diclofenac (DCF) and ibuprofen (IBP) during the application of various advanced oxidation processes in aqueous matrices. The examined processes were TiO₂ photocatalysis driven by UV-A or simulated solar irradiation, sonolysis, and UV-A photocatalysis integrated with ultrasound irradiation (sonophotocatalysis). A comparison between the applied treatment processes was performed with respect to the substrates first-order kinetic rate constant. When compared with sonolysis and UV-A photocatalysis, a higher degradation rate was observed for sonophotocatalysis in the presence of 500 mg L⁻¹ TiO₂. Seven TPs of IBP and ten TPs of DCF under UV-A and simulated solar irradiation photocatalysis and sonophotocatalysis, formed by consecutive attack of hydroxyl radicals (HO•) in concomitance with the degradation of the primary compounds, were tentatively identified. Overall, no differences were observed in the nature of TPs formed for each substrate among the experiments performed, indicating the involvement of similar reaction mechanisms. The degradation pathway of IBP includes mainly decarboxylation, demethylation and hydroxylation reactions, while the oxidation of DCF, mainly proceeded by oxidation and hydroxylation reactions between chloroaniline and phenylacetic acid. An important observation made during the experiments was that the hydroxylated species (1'-OH-IBP; 2'-OH-IBP; 4'-OH-DCF; 5'-OH-DCF) remained in the solution until 120 min. Finally, the results demonstrated the capacity of the sonophotocatalysis to reduce the initial toxicity of IBP and DCF aqueous solutions against the water flea *Daphnia magna* yielding 20% and 40% immobilization, respectively, at the end of the treatment.

Relevant publication: Yes

- 13** Victoria Osorio; Marta Imbert-Bouchard; Bozo Zonja; José-Luis Abad; Sandra Pérez; Damià Barceló. Simultaneous determination of diclofenac, its human metabolites and microbial nitration/nitrosation transformation products in wastewaters by liquid chromatography/quadrupole-linear ion trap mass spectrometry. *Journal of Chromatography A*. 1347, pp. 63 - 71. 2014. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0021967314006268>>. ISSN 0021-9673

DOI: 10.1016/j.chroma.2014.04.058

Type of production: Scientific paper

Position of signature: 1

Total no. authors: 6

Format: Journal

Impact source: ISI**Impact index in year of publication:** 4.169**Source of citations:** SCOPUS**Category:** Analytical Chemistry**Journal in the top 25%:** Yes**Citations:** 60

Relevant results: An analytical method was developed and validated for the first determination of five major human metabolites of the non-steroidal anti-inflammatory drug diclofenac as well as two microbial transformation products in wastewater. The method was based on the extraction of diclofenac and the chemically synthesized compounds by solid-phase extraction (SPE), using a hydrophilic-lipophilic balanced polymer followed by liquid chromatography (LC) coupled to hybrid quadrupole-linear ion trap mass spectrometry (QqLIT-MS). Quantitation was performed by the internal standard approach, to correct for matrix effects. The accuracy of the method was generally higher than 40% for raw and treated wastewater with a precision below 12%. In wastewater influent and effluent samples the detection limits for the majority of target compounds were 0.3-2.5ngL⁻¹ and 0.1-3.1ngL⁻¹, respectively. The method was applied to the analysis of influent and effluent wastewater samples from urban wastewater treatment plants. Moreover, to obtain an extra tool for confirmation and identification of the studied diclofenac-derived compounds, Information-Dependent Acquisition (IDA) experiments were performed, with selected reaction monitoring (SRM) as the survey scan and an enhanced product ion (EPI) scan as the dependent scan. Diclofenac and its major human metabolite, 4'-hydroxydiclofenac were detected in all samples at concentrations of 331-1150ngL⁻¹ and 585-6000ngL⁻¹, respectively. Neither microbial transformation product of diclofenac was detected in any of the influent samples analyzed, but in effluents, their concentrations ranged from 4 to 105ngL⁻¹.

Relevant publication: Yes

- 14** L. Proia; V. Osorio; S. Soley; M. Köck-Schulmeyer; S. Pérez; D. Barceló; A.M. Romani; S. Sabater. Effects of pesticides and pharmaceuticals on biofilms in a highly impacted river. *Environmental Pollution*. 178, pp. 220 - 228. 2013. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0269749113000985>>. ISSN 0269-7491

Type of production: Scientific paper**Format:** Journal**Position of signature:** 2**Total no. authors:** 8**Corresponding author:** No**Impact source:** ISI**Category:** Environmental Science (miscellaneous)**Impact index in year of publication:** 3.902**Journal in the top 25%:** No**Source of citations:** SCOPUS**Citations:** 96

Relevant results: e investigated the effects of pharmaceuticals and pesticides detected in a Mediterranean river, on fluvial biofilms by translocation experiments performed under controlled conditions. Water was sampled from three sites along a pollution gradient. Biofilms grown in mesocosms containing relatively clean water were translocated to heavily polluted water. Several biofilm descriptors were measured before and after translocations. Fifty-seven pharmaceuticals and sixteen pesticides compounds were detected in river waters. The translocation from less to more polluted site was the most effective. Autotrophic biomass and peptidase increased while phosphatase and photosynthetic efficiency decreased. Multivariate analysis revealed that analgesics and anti-inflammatories significantly affected biofilm responses. Ibuprofen and paracetamol were associated with negative effects on photosynthesis, and with the decrease of the green algae/cyanobacteria ratio, while diclofenac was associated with phosphatase activity. The effects of these emerging compounds on biofilms structure and function may cause important alterations in river ecosystem functioning.

Relevant publication: Yes

- 15** L. Proia; G. Lupini; V. Osorio; S. Pérez; D. Barceló; T. Schwartz; S. Amalfitano; S. Fazi; A.M. Romani; S. Sabater. Response of biofilm bacterial communities to antibiotic pollutants in a Mediterranean river. *Chemosphere*. 92 - 9, pp. 1126 - 1135. 2013. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0045653513001793>>. ISSN 0045-6535

Type of production: Scientific paper**Format:** Journal**Position of signature:** 3**Total no. authors:** 10**Impact source:** ISI**Category:** Environmental Science (miscellaneous)



Impact index in year of publication: 3.499

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 78

Relevant results: Antibiotics are emerging contaminants, which wing to their bioactivity, may lead to short-term and long-term alterations of natural microbial communities in aquatic environment. We investigated the effects of antibiotics on biofilm bacterial communities in the Llobregat River (Northeast Spain). Three sampling sites were selected: two less polluted sites and one hotspot. River water was collected from each site and used both as inoculum and medium for growing biofilms in independent mesocosms. After 25. d of biofilm colonization, we exposed the colonized biofilms to river waters from the downstream sites (progressively contaminated by antibiotics). A control from each site was maintained where the growing biofilm was always exposed to water from the same site. The bacterial community composition, bacterial live/dead ratio and extracellular enzyme activities of the biofilms were measured before and 9. d after exposing the biofilms to increasing contaminated waters. Sixteen antibiotic compounds were detected in the water from the three sampling sites. At each site, the antibiotics present in the highest concentrations were sulfonamides, followed by quinolones and macrolides. Bacterial communities of biofilms grown with the three river waters differed markedly in their structure, but less so in terms of functional descriptors. After switching the medium water to increasing pollution, biofilms exhibited increased levels of actinobacteria (HGC), a trend that was associated to the higher antibiotic concentrations in the water. These biofilms also showed increased bacterial mortality, and decreased extracellular leucine-aminopeptidase and alkaline phosphatase. There was a significant correlation between antibiotic concentrations and biofilm responses. Our results indicate that the continuous entrance of antibiotics in running waters cause significant structural and functional changes in microbial attached communities.

Relevant publication: Yes

- 16** Victoria Osorio; Rafael Marcé; Sandra Pérez; Antoni Ginebreda; Jose Luís Cortina; Damià Barceló. Occurrence and modeling of pharmaceuticals on a sewage-impacted Mediterranean river and their dynamics under different hydrological conditions. *Science of The Total Environment*. 440, pp. 3 - 13. 2012. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969712011242>>. ISSN 0048-9697

Type of production: Scientific paper

Format: Journal

Position of signature: 1

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 6

Corresponding author: No

Impact source: ISI

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 3.258

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 122

Relevant results: The occurrence of 73 representative pharmacologically active compounds (PhACs) was assessed in a sewage-impacted section of the Llobregat River (NE Catalonia, Spain). This Mediterranean river is characterized by flow rate fluctuations strongly influenced by seasonal rainfall. River flow variations increase the potential environmental risk posed by organic micro-pollutants as their concentrations may increase substantially under low flow conditions. Little is known about the transport behavior of emerging contaminants in surface waters once they are discharged from waste water treatment plants (WWTP) into rivers. This research aimed to study the presence and fate of emerging contaminants under different hydrological conditions by sampling two different sites along the river in different seasons. The highest levels of pharmaceuticals were determined during cold and dry periods. The impact of the flow changes on the concentration of the pharmaceuticals in the river was assessed with the relative sensitive coefficients. Due to expected dilution effects, the response of pharmaceuticals to river flow was negative. Only in a few cases, positive relationships between drug concentrations and flow were detected, suggesting an important role of other hydrological phenomena like sediment re-suspension as well as the source of pollutants. To evaluate the role of other factors influencing PhAC concentrations, a plug-flow model was applied to obtain disappearance constants "k" for a set of selected compounds. Erythromycin presented k values of $-0.15h^{-1}$ in both sites being the compound more efficiently removed from the water column. The k values for ibuprofen, furosemide, enrofloxacin, enalapril, acetaminophen, diclofenac and Ketoprofen were between -0.04 and $-0.10h^{-1}$ showing less disappearance than erythromycin in the water column. However, other compounds presented k values <0.06 , which suggested conservative behavior of these compounds in the water column. This study supports the reliability of the calculated k values for the disappearance of compounds in river waters.

Relevant publication: Yes

- 17** Victoria Osorio; Sandra Pérez; Antoni Ginebreda; Damià Barceló. Pharmaceuticals on a sewage impacted section of a Mediterranean River (Llobregat River, NE Spain) and their relationship with hydrological conditions. *Environmental Science and Pollution Research*. 19 - 4, pp. 1013 - 1025. 2012. Available on-line at: <<https://doi.org/10.1007/s11356-011-0603-4>>. ISSN 1614-7499

Type of production: Scientific paper

Format: Journal

Position of signature: 1

Total no. authors: 4

Corresponding author: No

Impact source: ISI

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 2.618

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 39

Relevant results: Mediterranean rivers are characterized by a high flow variability, which is strongly influenced by the seasonal rainfall. When water scarcity periods occur, water flow, and dilution capacity of the river is reduced, increasing the potential environmental risk of pollutants. On the other hand, floods contribute to remobilization of pollutants from sediments. Contamination levels in Mediterranean rivers are frequently higher than in other European river basins, including pollution by pharmaceutical residues. Little attention has been paid to the transport behavior of emerging contaminants in surface waters once they are discharged from WWTP into a river. In this context, this work aimed to relate presence and fate of emerging contaminants with hydrological conditions of a typical Mediterranean River (Llobregat, NE Spain).

Relevant publication: Yes

- 18** I. Michael; E. Hapeshi; V. Osorio; S. Perez; M. Petrovic; A. Zapata; S. Malato; D. Barceló; D. Fatta-Kassinos. Solar photocatalytic treatment of trimethoprim in four environmental matrices at a pilot scale: Transformation products and ecotoxicity evaluation. *Science of The Total Environment*. 430, pp. 167 - 173. 2012. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969712006493>>. ISSN 0048-9697

Type of production: Scientific paper

Format: Journal

Position of signature: 3

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 9

Corresponding author: No

Impact source: ISI

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 3.258

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 72

Relevant results: The pilot-scale solar degradation of trimethoprim (TMP) in different water matrices (demineralized water: DW, simulated natural freshwater: SW; simulated wastewater: SWW; and real effluent: RE) was investigated in this study. DOC removal was lower in the case of SW compared to DW, which can be attributed to the presence of inorganic anions which may act as scavengers of the HO. Furthermore, the presence of organic carbon and higher salt content in SWW and RE led to lower mineralization per dose of hydrogen peroxide compared to DW and SW. Toxicity assays in SWW and RE were also performed indicating that toxicity is attributed to the compounds present in RE and their by-products formed during solar Fenton treatment and not to the intermediates formed by the oxidation of TMP. A large number of compounds generated by the photocatalytic transformation of TMP were identified by UPLC-QToF/MS. The degradation pathway revealed differences among the four matrices; however hydroxylation, demethylation and cleavage reactions were observed in all matrices. To the best of our knowledge this is the first time that TMP degradation products have been identified by adopting a solar Fenton process at a pilot-scale set-up, using four different aqueous matrices.

Relevant publication: Yes

- 19** Marinella Farré; Sandra Pérez; Krisztina Gajda-Schranz; Victoria Osorio; Lina Kantiani; Antoni Ginebreda; Damià Barceló. First determination of C60 and C70 fullerenes and N-methylfulleropyrrolidine C60 on the suspended material of wastewater effluents by liquid chromatography hybrid quadrupole linear ion trap tandem mass spectrometry. *Journal of Hydrology*. 383 - 1, pp. 44 - 51. 2010. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0022169409004910>>. ISSN 0022-1694

Type of production: Scientific paper

Format: Journal

Position of signature: 4

**Total no. authors:** 7**Impact source:** ISI**Impact index in year of publication:** 2.514**Source of citations:** SCOPUS**Degree of contribution:** Author or co-author of article in journal with external admissions assessment committee**Corresponding author:** No**Category:** Science Edition - WATER RESOURCES**Journal in the top 25%:** Yes**Citations:** 152

Relevant results: The increasing use and production of carbon-based nanoparticles demands for new analytical approaches able to achieve sensitivities in the low ng/L range in order to assess their presence in environmental samples. This paper describes development, optimization and validation of a novel method for the analysis of C60 and, C70 fullerenes and N-methylfulleropyrrolidine C60 in the environment. The method relies on ultrasonication extraction from suspended solids in wastewater, followed by liquid chromatography (LC) coupled to a hybrid triple quadrupole linear ion trap mass spectrometry (QqLIT-MS) for trace quantification. Recoveries obtained were generally higher than 60% for both surface water and wastewaters. The overall variability of the method was below 15%, for the three fullerenes and all tested matrices: ultra-pure water, surface water and wastewater. For the effluents of wastewater treatment plants the method quantification limits (MQL) ranged from 0.2 to 1 ng/L. The precision of the method, calculated as relative standard deviation (RSD), ranged from 1% to 2% and from 5% to 9% for intra and inter-day analysis, respectively. The developed analytical method was applied to the analysis of fullerenes in the effluents of 22 wastewater treatment plants in Catalonia (NE of Spain). 50% of the analyzed samples contained fullerenes, nine of them in the µg/L concentration range. This work constitutes the first report on the occurrence of fullerenes in suspended solids of wastewater effluents highlighting the need of nanotechnologies residues assessment for risk evaluation of nanoparticles in the environment.

Relevant publication: Yes

- 20** Elisabet Martí; Victoria Osorio; Marta Llorca; Lidia Paredes; Meritxell Gros. Environmental risks of sewage sludge reuse in agriculture. *Advances in Chemical Pollution, Environmental Management and Protection*. 6, pp. 137 - 180. Elsevier, 2020. Available on-line at: <<https://www.sciencedirect.com/science/article/abs/pii/S2468928920300034?via%3Dihub>>. ISSN 2468-9289

Type of production: Book chapter**Format:** Book**Position of signature:** 2**Degree of contribution:** Author or co-author of chapter in book**Total no. authors:** 5**Corresponding author:** No**Impact source:** ISI**Impact index in year of publication:** 6.551**Citations:** 4

Relevant results: Sewage sludge reuse will become crucial for the sustainability of agriculture, given the increasing population and the lack of essential nutrients for crop growth. Nevertheless, this practice raises some concerns, due to the large amounts of contaminants of emerging concern (CECs) present in sewage sludge, including pharmaceuticals and personal care products (PPCPs), microplastics (MPs), engineered nanomaterials (ENMs), per- and polyfluoroalkyl substances (PFASs), flame retardants, plasticizers, metals, antibiotic resistance bacteria (ARB) and resistance genes (ARGs). These CECs may adversely affect the environment and, ultimately, human health through the consumption of crops grown under sludge-amended soils. This chapter reviews the potential environmental and human health risks associated with sewage sludge reuse in agriculture, by focusing on relevant classes of CECs, such as PPCPs, MPs, carbon-based ENMs and considering ARBs and ARGs, a topic so far poorly addressed. The risks discussed focus on the contamination of aquatic and terrestrial ecosystems and on CECs uptake by crops intended for human consumption. Finally, technological strategies to improve sludge treatment, and thus minimize such risks, are briefly discussed.

Relevant publication: Yes

- 21** Victoria Osorio; Merijn Schriks; Dennis Vughs; Pim de Voogt; Annemieke Kolkman. EDA grows stronger: towards the implementation of a state-of-the-art chemical toolbox within the EDA-EMERGE project. 2018. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0039914018304132>>. ISSN 0039-9140

Type of production: Scientific-technical report**Format:** Scientific and technical document or report**Position of signature:** 1

**Total no. authors:** 5**Impact source:** ISI**Impact index in year of publication:** 4.244**Source of citations:** SCOPUS**Corresponding author:** Yes**Category:** Analytical Chemistry**Journal in the top 25%:** Yes**Citations:** 6

Relevant results: A novel sample preparation procedure relying on Solid Phase Extraction (SPE) combining different sorbent materials on a sequential-based cartridge was optimized and validated for the enrichment of 117 widely diverse contaminants of emerging concern (CECs) from surface waters (SW) and further combined chemical and biological analysis on subsequent extracts. A liquid chromatography coupled to high resolution tandem mass spectrometry LC-(HR)MS/MS protocol was optimized and validated for the quantitative analysis of organic CECs in SW extracts. A battery of in vitro CALUX bioassays for the assessment of endocrine, metabolic and genotoxic interference and oxidative stress were performed on the same SW extracts. Satisfactory recoveries ([70–130]%) and precision (< 30%) were obtained for the majority of compounds tested. Internal standard calibration curves used for quantification of CECs, achieved the linearity criteria ($r_2 > 0.99$) over three orders of magnitude. Instrumental limits of detection and method limits of quantification were of [1–96] pg injected and [0.1–58] ng/L, respectively; while corresponding intra-day and inter-day precision did not exceed 11% and 20%. The developed procedure was successfully applied for the combined chemical and toxicological assessment of SW intended for drinking water supply. Levels of compounds varied from < 10 ng/L to < 500 ng/L. Endocrine (i.e. estrogenic and anti-androgenic) and metabolic interference responses were observed. Given the demonstrated reliability of the validated sample preparation method, the authors propose its integration in an effect-directed analysis procedure for a proper evaluation of SW quality and hazard assessment of CECs.

Relevant publication: Yes

- 22** Joana Aldekoa; Chiara Medici; Victoria Osorio; Sandra Pérez; Rafael Marcé; Damià Barceló; Félix Francés. Modelling the emerging pollutant diclofenac with the GREAT-ER model: Application to the Llobregat River Basin. *Journal of Hazardous Materials*. 263, pp. 207 - 213. 2013. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0304389413006237>>. ISSN 0304-3894

Type of production: Scientific paper**Format:** Journal**Impact source:** ISI**Category:** Environmental Science (miscellaneous)**Impact index in year of publication:** 4.331**Journal in the top 25%:** Yes**Source of citations:** SCOPUS**Citations:** 31

Relevant results: The present research aims at giving an insight into the increasingly important issue of water pollution due to emerging contaminants. In particular, the source and fate of the non-steroidal anti-inflammatory drug diclofenac have been analyzed at catchment scale for the Llobregat River in Catalonia (Spain). In fact, water from the Llobregat River is used to supply a significant part of the Metropolitan Area of Barcelona. At the same time, 59 wastewater treatment plants discharge into this basin. GREAT-ER model has been implemented in this basin in order to reproduce a static balance for this pollutant for two field campaigns data set. The results highlighted the ability of GREAT-ER to simulate the diclofenac concentrations in the Llobregat Catchment; however, this study also pointed out the urgent need for longer time series of observed data and a better knowledge of wastewater plants outputs and their parameterization in order to obtain more reliable results.

- 23** Manuela Barbieri; Jesús Carrera; Carlos Ayora; Xavier Sanchez-Vila; Tobias Licha; Karsten Nödler; Victoria Osorio; Sandra Pérez; Marianne Köck-Schulmeyer; Miren López de Alda; Damià Barceló. Formation of diclofenac and sulfamethoxazole reversible transformation products in aquifer material under denitrifying conditions: Batch experiments. *Science of The Total Environment*. 426, pp. 256 - 263. 2012. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/S0048969712002707>>. ISSN 0048-9697

Type of production: Scientific paper**Format:** Journal**Position of signature:** 7**Degree of contribution:** Author or co-author of article in journal with external admissions assessment committee**Total no. authors:** 11**Corresponding author:** No**Impact source:** ISI**Category:** Environmental Science (miscellaneous)**Impact index in year of publication:** 3.258**Journal in the top 25%:** Yes**Source of citations:** SCOPUS**Citations:** 65

Relevant results: Soil-aquifer processes have proven to work as a natural treatment for the attenuation of numerous contaminants during artificial recharge of groundwater. Nowadays, significant scientific effort is being devoted to understanding the fate of pharmaceuticals in subsurface environments, and to verify if such semipersistent organic micropollutants could also be efficiently removed from water. In this context we carried out a series of batch experiments involving aquifer material, selected drugs (initial concentration of 1 µg/L and 1 mg/L), and denitrifying conditions. Diclofenac and sulfamethoxazole exhibited an unreported and peculiar behavior. Their concentrations consistently dropped in the middle of the tests but recovered toward the end, which suggest a complex effect of denitrifying conditions on aromatic amines. The transformation products Nitro-Diclofenac and 4-Nitro-Sulfamethoxazole were detected in the biotic experiments, while nitrite was present in the water. Their concentrations developed almost opposite to those of their respective parent compounds. We conjecture that this temporal and reversible effect of denitrifying conditions on the studied aromatic amines could have significant environmental implications, and could explain at least partially the wide range of removals in subsurface environments reported in literature for DCF and SMX, as well as some apparent discrepancies on SMX behavior.

- 24** C. Gonçalves; S. Pérez; V. Osorio; M. Petrovic; M.F. Alpendurada; D. Barceló. Photofate of Oseltamivir (Tamiflu) and Oseltamivir Carboxylate under Natural and Simulated Solar Irradiation: Kinetics, Identification of the Transformation Products, and Environmental Occurrence. *Environmental Science & Technology*. 45 - 10, pp. 4307 - 4314. 2011. Available on-line at: <<https://doi.org/10.1021/es1032629>>.

Type of production: Scientific paper

Format: Journal

Position of signature: 3

Total no. authors: 6

Corresponding author: No

Impact source: ISI

Category: Environmental Science (miscellaneous)

Impact index in year of publication: 5.228

Journal in the top 25%: Yes

Source of citations: SCOPUS

Citations: 55

Relevant results: In this work the photodegradation pathways and rates of oseltamivir ester (OE) and oseltamivir carboxylate (OC) were studied under artificial and natural solar irradiation with the goal of assessing the potential of photolysis as a removal mechanism in aquatic environments. The structures of the photoproducts of OE, elucidated by ultra performance liquid chromatography-quadrupole-time-of-flight-mass spectrometry (UPLC-QToF-MS), were proposed to originate from hydration of the cyclohexene ring (TP330), ester hydrolysis (TP284), a combination thereof (TP302), intramolecular cyclization involving the ester (TP312), and cleavage of the ethylpropoxy side chain (TP226). The only photoproduct detected in case of OC was postulated to correspond to the hydration of the α,β -unsaturated acid (TP302). Under simulated solar irradiation the degradation rate of OC was approximately 10 times slower than that of OE, with half-lives ranging from 48 h in ultrapure water to 12 h in surface water from Sant Joan Despi, Llobregat river. The photodegradation under natural solar irradiation during the season of pandemic Influenza peak incidence was about 150 days for OC and 15 days for OE. In general, the photoproducts proved to be more resistant toward further photodegradation than the parent antivirals. In a monitoring survey of surface waters from the Ebro river (NE Spain), OC and OE were detected along with the photoproducts TP330 and 312.

- 25** Lorenzo Proia; Victoria Osorio. Chapter 18 - The Effect of PhACs on Biological Communities in Rivers: Field Studies. *Analysis, Removal, Effects and Risk of Pharmaceuticals in the Water Cycle: Occurrence and Transformation in the Environment*. 62, pp. 649 - 670. Elsevier, 2013. Available on-line at: <<http://www.sciencedirect.com/science/article/pii/B9780444626578000185>>. ISSN 0166-526X

Type of production: Book chapter

Format: Book

Position of signature: 2

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 2

Corresponding author: No

Source of citations: SCOPUS

Citations: 3

Relevant results: This chapter aims to review the current literature on field studies assessing the effects of pharmaceutically active compounds (PhACs) on fluvial biological communities. The importance of the use of these communities in the ecological risk assessment of PhACs in river ecosystems is tackled. The chapter reviews the literature about the potential effects of PhACs on the communities commonly belonging to the bottom and the top of river food chain (i.e., microbial and fish communities). In this framework, the Llobregat river is presented as a

greatly PhAC-polluted case, where numerous field studies have been performed. Particularly, evidences of PhACs effects on biofilm, macroinvertebrate, and fish communities of the Llobregat, reported by diverse investigations, are reviewed in this chapter. The conclusions suggest that the continuous population growth and the subsequent increase of sewage waste discharge on the aquatic systems may be reflected in even more pronounced effects of PhACs on biological communities.

- 26** Sandra Pérez; María-Eugenia Rubiano; Antoni Ginebreda Ginebreda; Cristina Postigo Postigo; Rebeca López-Serna López-Serna; Juan Blanco Blanco; Victoria Osorio Osorio; Miren López de Alda López de Alda; Mira Petrovi? Petrovi?; Jordi J. Pastor Pastor; Lleonard Matia Matia; Jordi Martín-Alonso Martín-Alonso; Antoni Munné Munné; Joan Jofre Jofre; Francisco Lucena Lucena; Míriam Agulló-Barceló Agulló-Barceló; Narcís Prat Prat; Damià Barceló Barceló. Wastewater Reuse in the Llobregat: The Experience at the Prat de Llobregat Treatment Plant. The Handbook of Environmental Chemistry. pp. 327 - 346. Springer Berlin Heidelberg, 2012. Available on-line at: <https://doi.org/10.1007/698_2012_151>. ISBN 978-3-642-30939-7

Type of production: Book chapter

Format: Book

Position of signature: 7

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 18

Corresponding author: No

Source of citations: SCOPUS

Citations: 5

Relevant results: Water scarcity is a consequence of both natural and anthropogenic factors including highly variable temporal and spatially heterogenic distribution of precipitations, growing populations, increasing water demand particularly for agriculture, and the widespread contamination of water resources by a plethora of organic and inorganic contaminants. In the countries bordering the Mediterranean Sea, water is a renewable resource relatively scarce during certain periods. Therefore, sustainable management of water resources is of utmost importance in these countries. In Catalonia a Mediterranean region located in the northeast of Spain, the reuse of tertiary treated wastewater is evaluated as alternative resource for water supply. On this basis, several campaigns on water reuse were conducted by the Catalan Water Agency in order to artificially enhance the flow along the river. In fall of 2009, the impact of tertiary treated effluent discharge on the ecology (pathogens and indicators, macroinvertebrate community assemblages, and biomarkers) and water quality of the river (priority and emerging pollutants: polar pesticides, illicit drugs, estrogens and pharmaceuticals as well as on the pathogens and microbial indicators of faecal contamination) and consequently to the drinking water supplies was evaluated in the lower stretch of the Llobregat River located in the vicinity of the town of Barcelona (NE Spain). The key findings of this study are reported in this book chapter. Chemical parameters were not significantly affected by the reclaimed water discharge with the exception of a slight increase in the ammonium concentration, conductivity, and TOC. Concerning priority substances, three pesticides increased in concentration but only diazinon exceed the quality threshold for human supply. Regarding the ecotoxicological assessment of illicit drugs and pharmaceuticals using algae for the toxicity value, differences between river upstream and downstream to the discharge of the treated tertiary wastewater were detected. For the other organisms the differences were imperceptibles. No perceptible effects were detected either in the ecological status of the river or in the load of pathogens and fecal indicators of the river water. In conclusion, the use of tertiary treated effluent for water reuse did not produce important alterations on river water quality downstream of the reclaimed water discharge.

- 27** Victoria Osorio; Meritxell Gros; Sandra Pérez; Damià Barceló. La corriente de “algunos” de nuestros ríos: “Yo os diré lo que lleva”: el río Ebro como caso de estudio”. De dar de beber y tomar las aguas a evitar algunas aguas. pp. 9 - 24. Fundación Genes y Gentes, 2015. Available on-line at: <<https://www.slideshare.net/genesygentes/de-dar-de-beber-y-tomar-las-aguas-a-evitar-algunas-aguas>>.

Type of production: Popular science book

Format: Book

Corresponding author: No

Relevant results: Debido a que los fármacos son contaminantes emergentes y a que su detección en los ríos españoles es relativamente reciente, no están incluidos en programas rutinarios de detección. Por ello, existen todavía pocos datos de su destino en el río Ebro, el segundo río más caudaloso de España. En los estudios recientes de análisis de fármacos en aguas del río Ebro éstos se detectaron en un intervalo típico de concentraciones de 10 a 100 ng / L, pero a veces se han detectado a niveles de altos ng/L o incluso de µg/L. Los fármacos analgésicos y antiinflamatorios, reguladores de lípidos, β-antagonistas y los antibióticos son los más frecuentemente detectados y también en los efluentes de aguas residuales de las depuradoras ya que la presencia de fármacos para la medicina humana en los ríos está relacionada con la eficiencia de eliminación de estos compuestos en las depuradoras. Por eso para tener ríos menos contaminados se debería aumentar

la eficiencia de eliminación de las depuradoras con nuevos tratamientos. En los últimos años se han aplicado tratamientos avanzados como reactores de membrana, humedales y utilizando lámparas ultravioletas con muy buenos resultados. Por otra parte existen procesos de descontaminación de tipo natural que pueden afectar al destino de los contaminantes en el río, como por ejemplo la dilución, biodegradación, la foto-degradación y la adsorción. Estos procesos son los más importantes que pueden afectar a la disminución de la concentración de los fármacos en los ríos y así se ha demostrado para el fármaco oseltamivir el cual desaparecía o se transformaba en el agua del río por efecto de la luz solar. La dilución es probablemente el proceso más eficiente en la atenuación de los niveles de fármacos detectados en las aguas de los ríos. Sin embargo, en sistemas mediterráneos sujetos a fluctuaciones estacionales de caudal, este efecto de atenuación puede llegar a ser nulo durante periodos de sequía, en los cuales los caudales de efluentes de depuradoras pueden representar un porcentaje relevante del caudal total del río. A pesar de que el riesgo ecológico asociado a la presencia de fármacos en los ríos parece todavía ser mínimo, como se ha demostrado en el río Ebro, es importante tener en cuenta la continua entrada de estos compuestos y la relevancia que pueden suponer durante periodos de sequía, especialmente teniendo en cuenta las previsiones de cambio climático para los sistemas mediterráneos. La evaluación de los riesgos ambientales asociados a la presencia de contaminantes prioritarios y emergentes en los sistemas acuáticos continentales ha alcanzado avances importantes en los últimos años, gracias al creciente número de estudios eco-toxicológicos realizados. Los valores de EC50 son una herramienta ampliamente utilizada para la predicción de los PNEC, con el fin de determinar los posibles efectos de los niveles de contaminantes detectados en los organismos acuáticos. No obstante, estas herramientas se basan principalmente en resultados de experimentos de toxicidad aguda sobre una sola especie. El incremento de estudios de la toxicidad crónica de estos compuestos sobre comunidades complejas a escala de ecosistema supone un reto para la evaluación efectiva del riesgo que implica la presencia de los fármacos en los sistemas acuáticos continentales.

- 28** Victoria Osorio; Lidia Paredes; Lorenzo Proia; Oscar Mauricio Martínez Avila; Mercè Boy-Roura; Sergio Ponsá; Meritxell Gros. Demostración de la capacidad de reducción de antibióticos en tecnologías de tratamiento de purines. Guía técnica de asesoramiento para el sector ganadero. (Demonstration of the potential of slurry treatment technologies to remove antibiotics). Demostración de la capacidad de reducción de antibióticos en tecnologías de tratamiento de purines. Guía técnica de asesoramiento para el sector ganadero. pp. 1 - 71. Universitat de Vic-Universitat Central de Catalunya, 2021.

Type of production: Scientific-technical report

Format: Scientific and technical document or report

Position of signature: 1

Degree of contribution: Author or co-author of scientific or technical document for the general public

Total no. authors: 7

Corresponding author: No

Relevant results: El proyecto "Ayudas a las actividades de Demostración", liderado por el CT BETA, para la elaboración del presente documento, consiste en el estudio de la capacidad de reducción de fármacos y antibióticos mediante tecnologías de tratamiento de deyecciones ganaderas (basados en los resultados ya publicados y pendiente de publicar en los mencionados artículos científicos) y la elaboración de una guía técnica para el asesoramiento del sector ganadero. Así, además de los estudios científicos ya publicados, esta guía enfoca la presentación de la problemática y de resultados obtenidos y propone una serie de recomendaciones a seguir en cuanto a la gestión de deyecciones ganaderas y su valorización como fertilizantes en campos de cultivo basándose en los intereses y las necesidades del sector ganadero. Por otro lado, la compilación de los resultados obtenidos en los estudios de reducción de niveles de fármacos y antibióticos en las tecnologías de separación sólido-líquido, NDN, digestión anaerobia y osmosis inversa, y compostaje; significará una aportación importante de conocimiento en el sector, que propiciará la creación de nuevas regulaciones, acordes con las evidencias científicas, cuando se implementen futuras directrices europeas referentes al contenido de fármacos y antibióticos en fertilizantes orgánicos. La fertilización de campos de cultivo con deyecciones ganaderas puede suponer un problema para el medio ambiente si no se trata previamente de forma adecuada. La dispersión de fármacos, antibióticos y genes de resistencia en el medio ambiente puede conllevar la reducción de la eficacia de productos farmacológicos usados en el tratamiento de enfermedades tanto en animales como en humanos. Por este motivo, el tratamiento de las deyecciones ganaderas para la reducción de estos contaminantes, a la vez que para recircular nutrientes, se plantea como una de las opciones más viables a corto plazo. Indudablemente, la divulgación de esta guía y la serie de recomendaciones proporcionadas, ayudará a los usuarios a orientarse en la utilización óptima de tecnologías de tratamiento para la reducción del impacto actual que pueden generar las deyecciones ganaderas en el medio ambiente y las consecuencias en la salud humana, favoreciendo de este modo un mantenimiento sostenible de la actividad no sólo ganadera sino también agrícola. The valorisation of slurry as biofertilizer is both ecologically and economically interesting due to its high content in organic matter and nutrients. Unfortunately, the intensification of livestock activity has contributed to the generation of large



volumes of concentrated slurry in very specific areas, which complicates its management. This situation has favoured the development of new technologies for slurry treatment with the aim of stabilizing the organic matter, concentrating and/or removing nutrients and producing energy. Until now, the technologies applied for slurry treatment have been selected based on their efficiency to remove/concentrate nutrients, to export the products obtained outside the surplus areas. However, the presence of antibiotics of veterinary origin in these products applied as biofertilizers in soils is an issue of growing concern due to the possible effects that these compounds may have on the environment and human health. Since antibiotics are not completely adsorbed or metabolized by animals, most of them are excreted in the urine or faeces, unchanged or as metabolites. These antibiotics can contribute to the development of antibiotic-resistant bacteria in manure, crops, and groundwater, and therefore, being ultimately transmitted to humans and animals. These bacteria, at the same time, are carriers of antibiotic resistance genes which can be easily transferred to bacterial pathogens, compromising the efficiency of antibiotics during the treatment of infections in both humans and animals. Consequently, the main objective of this project is the elaboration of a technical guide to adv...

Works submitted to national or international conferences

- 1** **Title of the work:** SUSPECT AND NON-TARGET LC-HRMS/MS FOR EDA OF CECS IN WATERS
Name of the conference: II Jornadas de Jóvenes Investigadores de la SEEM
Type of participation: 'Participatory - poster
Corresponding author: Yes
City of event: Madrid, Community of Madrid, Spain
Date of event: 29/05/2023
End date: 31/05/2023
Organising entity: Sociedad Española de Espectrometría de Masas (SEEM)
Jhesibel Chávez Ortiz; Sandra Pérez Solsona; Victoria Osorio Torrens. "SUSPECT AND NON-TARGET LC-HRMS/MS FOR EDA OF CECS IN WATERS".
- 2** **Title of the work:** Towards the unequivocal identification of bioactive cyclic lipopeptides by LC-HRMS/MS
Name of the conference: 18TH ANNUAL WORKSHOP ON EMERGING HIGH-RESOLUTION MASS SPECTROMETRY (HRMS) AND LC-MS/MS APPLICATIONS IN ENVIRONMENTAL ANALYSIS AND FOOD SAFETY
Type of event: Conference
Type of participation: 'Participatory - poster
Corresponding author: Yes
City of event: Barcelona, Catalonia, Spain
Date of event: 10/10/2022
End date: 11/10/2022
Organising entity: CSIC and ICRA
Type of contribution: Scientific paper
Victoria Osorio Torrens; Sara Rodríguez Mozaz.
- 3** **Title of the work:** Projecte REST-RESIST: "Antibiòtics d'ús restringit i gens resistents corresponents: seguiment de la seva aparició i destí al medi ambient i avaluació dels processos d'atenuació naturals i dissenyats per mitigar-ne la propagació"
Name of the conference: Primera Jornada Campus Aigua
Type of event: Workshop
Type of participation: Participatory - oral communication
Corresponding author: Yes
City of event: Girona, Catalonia, Spain
Date of event: 24/03/2022
End date: 24/03/2022
Organising entity: Universitat de Girona-Campus Aigua



Victoria Osorio Torrens; Jose Luís Balcázar; Sara Rodríguez Mozaz.

- 4** **Title of the work:** Combined assessment of occurrence and toxicological effects of micro-contaminants of emerging concern in Surface Waters
Name of the conference: SETAC Europe 29th Annual Meeting
Corresponding author: Yes
City of event: Helsinki, Finland
Date of event: 26/05/2019
End date: 30/05/2019
Organising entity: Society of Environmental Toxicology and Chemistry
Victoria Osorio; Stefan Kools; Dennis Vughs; Merijn Schriks; Pim de Voogt; Annemieke Kolkman.
- 5** **Title of the work:** HRMS/MS characterization of antibiotics Surfactins produced by *Bacillus amyloliquefaciens* for the assessment of their biological activity during microbial communication
Name of the conference: 11th International Symposium on Drug Analysis and 29th International Symposium on Pharmaceutical and Biomedical Analysis
Corresponding author: Yes
City of event: Leuven, Belgium
Date of event: 09/09/2018
End date: 12/09/2018
Organising entity: Belgian Society of Pharmaceutical Sciences
Victoria Osorio; Arguelles, A.; Smargiasso, N.; Ongena, M.; De Pauw, E.
- 6** **Title of the work:** Identification and structural elucidation of native Surfactins and variants produced by *Bacillus amyloliquefaciens* under different culture conditions
Name of the conference: 66th ASMS Conference on Mass Spectrometry and Allied Topics
Corresponding author: Yes
City of event: San Diego, United States of America
Date of event: 03/06/2018
End date: 07/06/2018
Organising entity: American Society for Mass Spectrometry
Victoria Osorio; Arguelles, A.; Smargiasso, N.; Ongena, M.; De Pauw, E.
- 7** **Title of the work:** Structural elucidation of Surfactins produced by *Bacillus amyloliquefaciens* under different culture conditions
Name of the conference: Belgian Society for Mass Spectrometry XXI Meeting
Corresponding author: Yes
City of event: Liege, Belgium
Date of event: 29/03/2018
Organising entity: Belgian Society for Mass Spectrometry
- 8** **Title of the work:** Validation of a hybrid sample preparation technique for combined broad chemical analysis and in vitro toxicity assessment of organic emerging pollutants in source waters
Name of the conference: EDA-EMERGE PhD. Student Conference
City of event: Leipzig, Germany
Date of event: 01/07/2015
Victoria Osorio.
- 9** **Title of the work:** Wastewater effluents as the principal emission source of pharmaceuticals to Iberian River Basins (Spain)
Name of the conference: Final SCARCE International Conference "River conservation under water scarcity"



Corresponding author: Yes

City of event: Tarragona, Spain

Date of event: 20/10/2014

End date: 21/10/2014

Victoria Osorio; Larrañaga, A.; Aceña, J.; Pérez, S.; Barceló, D.

- 10 Title of the work:** Effect Directed Analysis, the EDA-EMERGE project
Name of the conference: Short course in Analytical chemistry technologies for COAST Analytical Sciences Talent Programme that is part of the "Topsector Chemieburzenprogramma" (Top sector Chemistry grant program)
City of event: Utrecht, Holland
Date of event: 03/2014
Victoria Osorio; Schriks, M.; Kolkman, A.
- 11 Title of the work:** Development of work within the EDA-EMERGE project
Name of the conference: Specialized Course on Water cycle and Human health
City of event: Utrecht, Holland
Date of event: 01/2014
Victoria Osorio; Schriks, M.; Kolkman, A.
- 12 Title of the work:** A monitoring survey of pharmaceuticals in wastewater treatment plants and river water in four Iberian river basins
Name of the conference: 4th SCARCE International Conference
City of event: Cádiz, Spain
Date of event: 11/2013
Victoria Osorio; Aceña, J.; Pérez, S.; Barceló, D.
- 13 Title of the work:** First determination of diclofenac, sulfamethoxazole and their nitration and nitrosation transformation products in wastewaters and evaluation of their acute toxicity
Name of the conference: SETAC Europe 23rd Annual Meeting
Corresponding author: Yes
City of event: Glasgow, United Kingdom
Date of event: 12/05/2013
End date: 16/05/2013
Organising entity: Society of Environmental Toxicology and Chemistry
Victoria Osorio; Sanchís, J.A.; Abad, J.L.; Ginebreda, A.; Farré, M.; Pérez, S.; Barceló, D.
- 14 Title of the work:** Study of the presence, fate and distribution of pharmaceuticals on Iberian river basins under the SCARCE Consolider project
Name of the conference: AquaConSoil 2013 — 12th International UFZ-Deltares Conference on Groundwater-Soil-Systems and Water Resource Management
Corresponding author: Yes
City of event: Barcelona, Catalonia, Spain
Date of event: 16/04/2013
End date: 19/04/2013
Organising entity: UFZ-Deltares
Victoria Osorio; Marcé, R.; Pérez, S.; Ginebreda, A.; Barceló, D.
- 15 Title of the work:** Study of Diclofenac metabolic biotransformation pathways to its nitrified microbial metabolites and development of an LC-MS/MS method for their determination in wastewater
Name of the conference: 8th Annual LC/MS/MS Workshop on Environmental Applications and Food Safety



City of event: Barcelona, Catalonia, Spain

Date of event: 02/07/2012

End date: 04/07/2012

Organising entity: Consejo Superior de Investigaciones Científicas

Type of entity: State agency

Victoria Osorio; Imbert-Bouchard, M.; Navarro, A.; Abad, J.L.; Ginebreda, A.; Pérez, S.; Barceló, D.

16 Title of the work: Occurrence of Pharmaceuticals on a sewage impacted section of a Mediterranean River (Llobregat, NE Spain) and their behaviour under different hydrological climate conditions

Name of the conference: SETAC Europe 22nd Annual Meeting and SETAC World 6th Congress

Corresponding author: Yes

City of event: Berlin, Germany

Date of event: 20/05/2012

End date: 24/05/2012

Organising entity: Society of Environmental Toxicology and Chemistry

Victoria Osorio; Marcé, R.; Pérez, S.; Ginebreda, A.; Barceló, D.

17 Title of the work: Presència de Fàrmacs en un tram de descàrrega d'efluents residuals en un riu Mediterrani (Llobregat, NE Espanya) i el seu comportament sota condicions climàtiques hidrològiques diferents

Name of the conference: VII Trobada de Joves Investigadors dels Països Catalans

City of event: Palma de Mallorca, Spain

Date of event: 16/02/2012

End date: 17/02/2012

Organising entity: Societat Catalana de Química

Victoria Osorio; Pérez, S.; Ginebreda, A.; Barceló, D.

18 Title of the work: Biotransformation of diclofenac and its related non-steroidal anti-inflammatory drugs (NSAIDs) into nitro and nitroso derivatives in batch reactors

Name of the conference: 13as Jornadas de Analisis Instrumental

City of event: Barcelona, Catalonia, Spain

Date of event: 14/11/2011

End date: 16/11/2011

Organising entity: SOCIEDAD ESPAÑOLA DE QUIMICA ANALITICA

Victoria Osorio; Pérez, S.; Barceló, D.

19 Title of the work: Ecological and micropollutants response of a Mediterranean river to hydrological natural variations: the Llobregat case study

Name of the conference: 2nd Annual Meeting SCARCE

City of event: Girona, Catalonia, Spain

Date of event: 11/2011

Victoria Osorio; Proia, L.; Ricart, M.; Pérez, S.; Ginebreda, A.; Barceló, D.

20 Title of the work: Seasonal monitoring of Pharmaceuticals on a sewage impacted section of a Mediterranean River (Llobregat River, NE Spain) and their relationship with hydrological conditions

Name of the conference: 2nd Annual Meeting SCARCE

City of event: Girona, Catalonia, Spain

Date of event: 11/2011

Victoria Osorio; Pérez, S.; Ginebreda, A.; Barceló, D.



- 21** **Title of the work:** Biodegradation of non-steroidal antiinflammatory drugs (NSAIDs) and their non-halogenated analogous in nitrifying batch reactors
Name of the conference: SETAC Europe 21st Annual Meeting
Corresponding author: Yes
City of event: Milano, Lombardia, Italy
Date of event: 15/05/2011
End date: 19/05/2011
Organising entity: Society of Environmental Toxicology and Chemistry
Victoria Osorio; Pérez, S.; Barceló, D.
- 22** **Title of the work:** Relation between the presence of pharmaceuticals and some hydrological parameters of the Llobregat River (NE Spain)
Name of the conference: 1st Annual Meeting SCARCE
City of event: Girona, Catalonia, Spain
Date of event: 12/2010
Victoria Osorio; Algaba, O.; Pèrez, S.; Ginebreda, A.; Barceló, D.
- 23** **Title of the work:** Relation of the presence and fate of emerging contaminants with the hydrological situation of Mediterranean Rivers: the Llobregat River (NE Spain) case
Name of the conference: 20th Annual Meeting SETAC Europe
Corresponding author: Yes
City of event: Sevilla, Andalusia, Spain
Date of event: 23/05/2010
End date: 27/05/2010
Organising entity: Society of Environmental Toxicology and Chemistry
Victoria Osorio; Pèrez, S.; Farré, M.; Köck, M.; Ginebreda, A.; López de Alda, M.; Barceló, D.
- 24** **Title of the work:** Occurrence and fate of diclofenac and its human metabolites in WWTPs. Identification of their transformation products in batch reactors
Name of the conference: INNOVA-MED CONFERENCE "Innovative processes and practices for wastewater treatment and re-use in the Mediterranean region"
City of event: Girona, Catalonia, Spain
Date of event: 08/10/2009
End date: 09/10/2009
Organising entity: FP6 EU project INNOVA-MED
Victoria Osorio; Pèrez, S.; Adab, J.L.; Llorca, M.; Farré, M.; Barceló, D.
- 25** **Title of the work:** Presence of diclofenac and its human metabolites in WWTP and evaluation of their toxicity. Identification of their transformation products in a lab-scale batch reactors
Name of the conference: IV Meeting of the Spanish Mass Spectrometry Society
Corresponding author: Yes
City of event: Castellon de la Plana, Valencian Community, Spain
Date of event: 30/09/2009
End date: 02/10/2009
Organising entity: Spanish Society of Mass Spectrometry
Victoria Osorio; Pèrez, S.; Abad, J.L.; Farré, M.; Barceló, D.



Works submitted to national or international seminars, workshops and/or courses

- 1 Title of the work:** Effect Directed Analysis, the EDA-EMERGE project
Name of the event: Short course in Analytical chemistry technologies for COAST Analytical Sciences Talent Programme is part of the "Topsector Chemiebeurzenprogramma" (Top sector Chemistry grant program)
Type of event: Course
City of event: Utrecht, Holland
Date of event: 03/2014
End date: 03/2014
Organising entity: COAST actions
Victoria Osorio Torrens; Merijn Schriks; Annemieke Kolkman.
- 2 Title of the work:** Development of work within the EDA-EMERGE project
Name of the event: Specialized Course on Water cycle and Human health
Type of event: Course
City of event: Utrecht, Holland
Date of event: 01/2014
End date: 01/2014
Organising entity: EDA-EMERGE MSCA-ITN
Victoria Osorio Torrens; Merijn Schriks; Annemieke Kolkman.

R&D management and participation in scientific committees

Scientific, technical and/or assessment committees

- 1 Committee title:** European Economic and Social Committee (Rapporteur's Expert Group II for the NAT/830 - Towards Zero Pollution for Air, Water and Soil)
Primary (UNESCO code): 230000 - Chemistry; 560000 - Juridical Sciences & Law
Secondary (UNESCO code): 560300 - International law
Tertiary (UNESCO code): 560399 - Other
Affiliation entity: Comisión Europea **Type of entity:** EU institution
City affiliation entity: Brussels, Belgium
Start-End date: 18/05/2021 - 20/10/2021
- 2 Committee title:** European Economic and Social Committee (Rapporteur's Expert Group II for the NAT/807 - Chemicals Strategy for Sustainability)
Primary (UNESCO code): 230000 - Chemistry; 560000 - Juridical Sciences & Law
Secondary (UNESCO code): 560300 - International law
Tertiary (UNESCO code): 560399 - Other
Affiliation entity: Comisión Europea **Type of entity:** EU institution
City affiliation entity: Brussels, Belgium
Start-End date: 05/11/2020 - 30/04/2021



Organization of R&D activities

- 1 Title of the activity:** Reducció d'antibiòtics mitjançant tecnologies per al tractament de purins (Reduction of antibiotics using manure treatment technologies)
Type of activity: Technical Conference
City of event: Vic, Catalonia, Spain
Convening entity: BETA Technological Center-University of Vic
Type of participation: Organiser
N° assistants: 70
Start-End date: 12/2019 - 12/2019 **Duration:** 1 day
- 2 Title of the activity:** EDA-EMERGE PhD. Student Conference
Type of activity: Conference
City of event: Leipzig, Germany
Convening entity: MSCA_ITN EDA-EMERGE
Type of participation: Chairman
N° assistants: 150
Start-End date: 07/2015 - 07/2015 **Duration:** 2 days
- 3 Title of the activity:** Specialized Course on Water cycle and Human health
Type of activity: Course
Convening entity: MSCA-ITN EDA-EMERGE **Type of entity:** MSCA-Actions
City convening entity: Utrecht, Holland
Type of participation: Organiser
N° assistants: 80
Start-End date: 01/2014 - 01/2014 **Duration:** 1 day

Evaluation and revision of R&D projects and articles

- 1 Name of the activity:** Reviewer
Performed tasks: Revision of scientific article
Entity where activity was carried out: Environmental Science and Technology
Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1
Access system: Designated by the corresponding party without competition
Start date: 2022
- 2 Name of the activity:** Reviewer
Performed tasks: Revision of scientific article
Entity where activity was carried out: Journal of Exposure Science and Environmental Epidemiology
Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1
Access system: Designated by the corresponding party without competition
Start date: 2020
- 3 Name of the activity:** Reviewer
Performed tasks: Revision of scientific article
Entity where activity was carried out: Aquatic Toxicology



Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition

Start date: 2019

4 Name of the activity: Reviewer

Performed tasks: Revision of scientific article

Entity where activity was carried out: Environmental International

Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition

Start date: 2019

5 Name of the activity: Reviewer

Performed tasks: Revision of scientific article

Entity where activity was carried out: Journal of Hazardous Materials

Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition

Start date: 2018

6 Name of the activity: Reviewer

Performed tasks: Revision of scientific article

Entity where activity was carried out: Journal of Pharmaceutical and Biomedical Analysis

Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition

Start date: 2018

7 Name of the activity: Reviewer

Performed tasks: Revision of scientific article

Entity where activity was carried out: Talanta

Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition

Start date: 2018

8 Name of the activity: External Reviewer

Performed tasks: Revision of Doctoral Thesis

Entity where activity was carried out: Universitat Politècnica de Catalunya **Type of entity:** University

Type of activity: Review of Doctoral Thesis **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition

Start date: 2017

9 Name of the activity: Reviewer

Performed tasks: Revision of scientific article

Entity where activity was carried out: Environmental Pollution

Type of activity: Review of articles in scientific or technological journals **Frequency of the activity:** 1

Access system: Designated by the corresponding party without competition



Start date: 2016

10 Name of the activity: Reviewer
Performed tasks: Revision of scientific article
Entity where activity was carried out: Environmental Science and Pollution Research
Type of activity: Review of articles in scientific or technological journals
Frequency of the activity: 7
Access system: Designated by the corresponding party without competition
Start date: 2015

11 Name of the activity: Reviewer
Performed tasks: Revision of scientific article
Entity where activity was carried out: Journal of Analytical Chromatography A
Type of activity: Review of articles in scientific or technological journals
Frequency of the activity: 1
Access system: Designated by the corresponding party without competition
Start date: 2014

12 Name of the activity: Reviewer
Performed tasks: Revision of scientific book chapter
Entity where activity was carried out: Wiley Online Library
Type of activity: Review of articles in scientific or technological journals
Frequency of the activity: 1
Access system: Designated by the corresponding party without competition
Start date: 2014

13 Name of the activity: Reviewer
Performed tasks: Revision of scientific article
Entity where activity was carried out: Science of the Total Environment
Type of activity: Review of articles in scientific or technological journals
Frequency of the activity: 4
Access system: Designated by the corresponding party without competition
Start date: 2013

Other achievements

Stays in public or private R&D centres

1 Entity: FUNDACIO UNIVERSITARIA BALMES DE VIC
Faculty, institute or centre: BETA Technological Center-Universitat de Vic
City of entity: Vic, Catalonia, Spain
Primary (UNESCO code): 220901 - Absorption spectroscopy; 230103 - Chromatographic analysis; 230106 - Fluorimetry; 230107 - Gravimetry; 230110 - Mass spectroscopy; 230119 - Volumetry; 230331 - Water chemistry; 239100 - Environmental Chemistry; 310300 - Agronomy; 310490 - Livestock production systems; 330801 - Air pollution control; 330810 - Sewage technology; 330811 - Water pollution control; 331108 - Laboratory equipment
Start-End date: 21/09/2019 - 20/01/2021
Duration: 2 years
Goals of the stay: Contracted
Provable tasks: Optimization, validation, and quality assurance of instrumental analytical methods applied to the assessment of chemicals in complex environmental samples and residues from anthropogenic

activities. - Optimization and validation of analytical methods using Gas Chromatography coupled to Mass Spectrometry detection for the quantitative determination of Taste & Odour Compounds (i.e. geosmin) in surface and drinking water. - Optimization and validation of analytical methods using Ionic Chromatography coupled to Electrochemical detection for the quantitative determination of nitrates and phosphates in complex solid and liquid matrices from agroindustry or animal manure origin. - Optimization and validation of analytical methods using ionic Gas Chromatography coupled to Electron Capture Detector (GC-ECD) for the simultaneous determination of green-house gas emissions. - Optimization and validation of analytical methods using ionic Total organic Carbon Analyzer for the quantitative determination of organic carbon and nitrogen species in solid and liquid matrices from agroindustry or animal manure origin. - Optimization and validation of analytical methods using atomic absorption for the quantitative determination of metals in samples from agroindustry or animal manure origin. - Optimization and validation of analytical methods using ionic Elemental Analyzer for the simultaneous determination of carbon, hydrogen and nitrogen species in solid and liquid matrices from agroindustry or animal manure origin.

Acquired skills developed: Preparation of project proposals-Organisation of technological conferences- Dissemination and outreach activities to audience of different levels of expertise-Participation in technology and knowledge transfer activities- Development and validation of analytical methods based on classical and instrumental techniques for the analysis of complex environmental and engineered samples-Coordination and management of instrumental laboratory._Acquisition, set-up and maintenance of instrumental analytical equipment (GC-MS, GC-FID/ECD, GC-FID/TCD, TOC and Elemental analyzers, Ionic Chromatography, Atomic Absorption Spectroscopy).

Relevant results: Contribution to several technological and scientific knowledge transfer projects and other agreements with companies from the water service and agri-food sectors. Optimization, validation and quality assurance of instrumental analytical methods applied to the assessment of chemicals in complex environmental samples and residues from anthropogenic activities

Identify key words: Water resources; Soil resources; Organic pollution; Chemical pollution; Greenhouse effect; Water analysis; Environmental impact; Livestock farming; Environmental monitoring; Environmental law; Fertiliser; Environmental research; Community environmental policy; Quality of the environment; Pollution from agricultural sources; Eutrophication; Polluted area

2 Entity: University of Liège

Type of entity: University

Faculty, institute or centre: Facultad de Ciencias

City of entity: Liège, Belgium

Primary (UNESCO code): 230103 - Chromatographic analysis; 230110 - Mass spectroscopy; 230199 - Other (specify); 310110 - Plant growth regulators

Secondary (UNESCO code): 330000 - Technological Science.

Tertiary (UNESCO code): 310000 - Agricultural Sciences

Start-End date: 31/12/2016 - 31/12/2018

Duration: 2 years

Funding entity: European Commission (Marie Skłodowska-Curie International Training Network, 7th programme) (FP7-PEOPLE- 2011-ITN, grant agreement number 290100)

Type of entity: Public Research Body

Name of programme: Mass spectrometry imaging of model biological systems interacting with active molecules

Goals of the stay: Post-doctoral

Provable tasks: Study of cyclic lipopeptides (CLPs) metabolized by plant-growth promoting bacteria in the rhizosphere zone exerting specific bioactivities beneficial for the plant. Structural characterization of CLPs by Ultra High Performance Liquid Chromatography coupled to High Resolution tandem Mass Spectrometry (UPLC-HRMS/MS) to provide a tool for unequivocal identification of the specific isoforms of these metabolites produced under different culture conditions. Optimization of analytical methods for the HRMS Imaging of CLPs in bacteria colonies during microbial interaction, using Matrix Assisted Laser Desorption Ionization coupled to a Fourier Transform Ion Cyclotron Resonance analyzer (MALDI-FTICR) and/or applying Liquid Extraction Surface Analysis (LESA) coupled to ESI-FTICR.

Acquired skills developed: Expertise in structural elucidation of complex organic structures (i.e. cyclic lipopeptides) by Ultra High Performance Liquid Chromatography coupled to High Resolution tandem Mass Spectrometry. Expertise in sample preparation and analytical procedures for High resolution Mass



Spectrometry Imaging of cyclic lipopeptides metabolized by bacteria during microbial interactions in the rhizosphere zone.

Relevant results: Tool for unequivocal identification of the specific isoforms of CLPs produced under different culture conditions by (UPLC-ESI(+)-HRMS/MS). The outcomes allowed selecting the optimal bacteria growth conditions boosting the production of the more bioactive CLPs. With the MALDI-FTICR and LESA-ESI-FTICR methods developed CLPs produced by different bacteria species were identified and their diffusion in the rhizosphere zone during their interaction with other microorganisms present (e.g. bacteria, pathogens) could be described.

Identify key words: Mass spectrometry; Liquid chromatography (uv, luminiscence, ms, electrochemical, etc)

3 Entity: Department of Chemical Water Quality and Health, KWR Watercycle Research Institute **Type of entity:** Innovation and Technology Centres

Faculty, institute or centre: Instituto

City of entity: Nieuwegein, Utrecht, Holland

Primary (UNESCO code): 230103 - Chromatographic analysis; 230110 - Mass spectroscopy; 239000 - Pharmaceutical Chemistry; 239100 - Environmental Chemistry

Secondary (UNESCO code): 230000 - Chemistry; 330810 - Sewage technology; 330811 - Water pollution control

Tertiary (UNESCO code): 240000 - Life Science

Start-End date: 31/08/2013 - 31/08/2015

Funding entity: European Commission (Marie Skłodowska-Curie International Training Network, 7th programme) (FP7-PEOPLE- 2011-ITN, grant agreement number 290100)

Type of entity: Public Research Body

Name of programme: EDA-EMERGE Novel tools in effect directed analysis for identifying and monitoring emerging toxicants on a European scale

Goals of the stay: Post-doctoral

Provable tasks: Experienced Researcher in Analytical Chemistry (postdoctoral role). Development of analytical procedures for the assessment of the chemical and biological quality status of surface water bodies.

Acquired skills developed: Expertise in sample preparation procedures and analytical methods for the assessment of widely diverse organic contaminants of emerging concern in complex environmental samples following effect directed analysis. Expertise in management and assessment of workpackage within the project and early stage researchers contributing to the project.

Relevant results: Development of a novel sample preparation procedure, relying on SPE combining different sorbent materials on a sequential-based cartridge for the enrichment of widely diverse contaminants of emerging concern from surface waters, for further combined chemical and biological analysis on the same subsequent extract. The procedure was successfully applied to the chemical and ecotoxicological assessment of SW by means of LC-(HR)MS/MS quantitative analysis and in vitro CALUX bioassays (e.g. endocrine and metabolic responses). Given the demonstrated reliability of this sample preparation method, applicable to a broad range of organic CECs, I proposed its integration in an effect-directed analysis procedure in order to improve the monitoring of SW chemical and biological quality status and the identification of key toxicants in the aquatic environment.

Identify key words: Analytic chemistry; Organic chemistry; Environmental protection; Water management

4 Entity: INSTITUTO DE DIAGNOSTICO AMBIENTAL Y ESTUDIOS DEL AGUA **Type of entity:** State agency

City of entity: Barcelona, Catalonia, Spain

Primary (UNESCO code): 230100 - Analytical chemistry; 230219 - Metabolic processes; 230220 - Microbiological chemistry; 230600 - Organic chemistry; 239100 - Environmental Chemistry

Start-End date: 01/01/2009 - 30/07/2013

Duration: 4 years - 6 months

Name of programme: VIECO (2008 009/RN08/011) and SCARCE (Consolider-Ingenio CSD2009-00065) national projects

Goals of the stay: Doctorate



Provable tasks: Masters and PhD research in Environmental Analytical Chemistry

Acquired skills developed: Development and validation of analytical methods based on LC-MS/MS and HR/MS for the study of occurrence, fate and behaviour of pharmaceuticals, their metabolites and transformation products in environmental and wastewaters.-Application of modelling approaches _ Assessment of the effects of pharmaceuticals and their metabolites and TPs on the aquatic ecosystems-Dissemination and Communication

Relevant results: characterization of the main Iberian river basins in terms of PhACs pollution related to anthropogenic pressure and environmental ecotoxicological risks.-Structural elucidation and identification of biodegradation products of pharmaceuticals diclofenac and structurally related NSAIDs and sulfamethoxazole in simulated conventional activated sludge treatment and aquifer by LC-HRMS/MS.- Development and validation of an analytical method based on LC-MS/MS for the simultaneous determination of diclofenac, its human metabolites and microbial nitration/nitrosation transformation products in wastewaters

Identify key words: Analytic chemistry; Organic chemistry; Water pollution; Water treatment; Water analysis; Pollution control; Hydrology

5 **Entity:** Department of Civil and Environmental Engineering **Type of entity:** University

Faculty, institute or centre: University of Cyprus

City of entity: Nicosia, Cyprus, Cyprus

Primary (UNESCO code): 330000 - Technological Science.

Secondary (UNESCO code): 230000 - Chemistry

Tertiary (UNESCO code): 240000 - Life Science

Start-End date: 01/06/2011 - 01/09/2011

Funding entity: Department of Civil and Environmental Engineering

Type of entity: University Department

City funding entity: Nicosia, Cyprus

Name of programme: PhD

Goals of the stay: Doctorate

Provable tasks: Environmental Analytical Chemist, PhD student role. Structural elucidation of transformation products of pharmaceuticals present in wastewater after photocatalytic processes applied during wastewater treatment.

Relevant results: Structural elucidation and identification of phototransformation products of pharmaceuticals diclofenac and ibuprofene in wastewater treated samples by LC-HRMS/MS

Identify key words: Natural sciences and health sciences

6 **Entity:** INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA

Faculty, institute or centre: ICRA-Water Quality Department

City of entity: Girona, Catalonia, Spain

Primary (UNESCO code): 230000 - Chemistry; 240000 - Life Science; 250000 - Earth and space sciences; 310000 - Agricultural Sciences; 320000 - Medical Science; 330000 - Technological Science.

Secondary (UNESCO code): 230100 - Analytical chemistry; 241400 - Microbiology; 250800 - Hydrology; 251100 - Soil Science; 310300 - Agronomy; 310400 - Animal husbandry; 320400 - Occupational medicine; 330800 - Environmental technology and Engineering

Tertiary (UNESCO code): 230102 - Biochemical analysis; 230103 - Chromatographic analysis; 230110 - Mass spectroscopy; 239100 - Environmental Chemistry; 241404 - Bacteriology; 250804 - Ground water; 250811 - Quality of water; 250813 - Soil moisture; 250814 - Surface waters; 251104 - Soil chemistry; 251109 - Soil microbiology; 310306 - Field crops; 310391 - Use (management) combined water and fertilizer; 310490 - Livestock production systems; 321200 - Public health; 330804 - Pollution engineering; 330806 - Reclamation of water; 330810 - Sewage technology; 330811 - Water pollution control

Start date: 01/04/2021

Duration: 3 years

Name of programme: MSCA-COFUND-BdP 2019 Project: REST-RESIST

Goals of the stay: Post-doctoral



Provable tasks: Development and validation of analytical methods based on LC-MS/MS for the analysis of Veterinary Antibiotics- Development and validation of bio-molecular assays (PCR and qPCR analysis) for the quantification of antibiotic resistant genes- Development of Non-Target Screening analytical methods based on HRMS-Development of natural and engineered transformation experiments of veterinary antibiotics in different matrices for the structural elucidation of metabolites and transformation products of veterinary antibiotics to study their fate and behavior in agro-ecosystems.

Identify key words: Analytic chemistry; Soil science; Degradation of the environment; Molecular, cellular and genetic biology; Livestock; Pollution; Agriculture; Water management

7 Entity: Universitat de Girona

Type of entity: University

Faculty, institute or centre: Faculty of Sciences

City of entity: Girona, Catalonia, Spain

Primary (UNESCO code): 230000 - Chemistry

Secondary (UNESCO code): 230100 - Analytical chemistry; 230200 - Biochemistry

Tertiary (UNESCO code): 230101 - Absorption spectroscopy; 230102 - Biochemical analysis; 230103 - Chromatographic analysis; 230104 - Electrochemical analysis; 230105 - Emission spectroscopy; 230106 - Fluorimetry; 230110 - Mass spectroscopy; 230216 - Immunochemistry; 230218 - Lipids; 230223 - Nucleic acids; 230224 - Peptides; 230291 - Chemical biological macromolecules; 230418 - Polypeptides and proteins

Start date: 01/10/2020

Goals of the stay: Contracted

Provable tasks: Teaching activities on the following subjects: - Bioanalysis: Analytical methodologies for the determination of biomolecules and biological, clinical and pharmaceutical substances. Immunochemical and enzymatic analysis. Sensors and biosensors. Advanced methodologies in chromatography and mass spectrometry. (Optional subject in 4th course program of Biotechnology and Chemistry Degrees) - Water Quality: Water composition and pollution. The concept of water quality. Regulatory issues. Water quality indicators (physicochemical, microbiological, biological). Water quality indexes. Monitoring and control of water quality. (Optional subject in Master Degree in Science and Technology of Hydrological Resources) - Experimentation in Quantitative Instrumental Methods: Use of instrumental methods and techniques of analysis. (Obligatory subject in 3rd course program of Biotechnology Degree and 5th course program of Double Degree in Biology and Biotechnology) - Experimentation in Analytical Chemistry: Analytical laboratory for the determination of organic and inorganic compounds. Applications of the main instrumental techniques in Analytical Chemistry: chromatographic, optical, electrochemical, etc. Quality management in the analytical laboratory. (Obligatory subject in 3rd course program of Chemistry Degree) - Integrated Practices: Application to the production and characterization of a biotechnology product at laboratory scale. (Obligatory subject in 3rd course program of Biotechnology Degree and 5th course program of Double Degree in Biology and Biotechnology)

Acquired skills developed: Communication-Teaching strategies-Preparation of academic material

Relevant results: Educational management and particularly in teaching subjects related with analytical chemistry, biotechnology, biology and hydrology sciences.

Identify key words: Analytic chemistry

Obtained grants and scholarships

1 Name of the grant: Beatriu de Pinós 2019 Marie Skłodowska-Curie Action COFUND (801370)

Aims: Post-doctoral

Awarding entity: Agència de Gestió d'Ajuts Univesitaris i de Recerca de Catalunya and European Commission

Conferral date: 01/04/2021

Duration: 3 years

End date: 30/03/2024

Entity where activity was carried out: INSTITUT CATALÀ DE RECERCA DE L'AIGUA - FUNDACIÓ PRIVADA

Faculty, institute or centre: Research Centre





- 2** **Name of the grant:** Marie-Curie BEIPD-COFUND-IPD fellowship
Aims: Post-doctoral
Awarding entity: University of Liège and European Commission
Conferral date: 31/12/2016 **Duration:** 2 years
End date: 31/12/2018
Entity where activity was carried out: University of Liège
Faculty, institute or centre: Faculty of Sciences
- 3** **Name of the grant:** Marie Curie-ITN ER fellowship
Aims: Experienced Researcher
Awarding entity: European Commission
Conferral date: 01/09/2013 **Duration:** 2 years
End date: 31/08/2015
Entity where activity was carried out: Watercycle Research Institute - KWR
Faculty, institute or centre: Department of Chemical Water Quality and Health
- 4** **Name of the grant:** Ramón y Cajal
Aims: Post-doctoral
Awarding entity: Ministerio de Ciencia e Innovación **Type of entity:** Ministerio de Ciencia e Innovación
Conferral date: 07/07/2022 **Duration:** 5 years
Entity where activity was carried out: INSTITUTO DE DIAGNOSTICO AMBIENTAL Y ESTUDIOS DEL AGUA
Faculty, institute or centre: Environmental Chemistry
- 5** **Name of the grant:** University Research Fund (BOF) fellowship (rejected)
Aims: Post-doctoral
Awarding entity: University of Antwerp (Belgium)
Conferral date: 01/09/2016 **Duration:** 1 year
Entity where activity was carried out: Watercycle Research Institute - KWR
Faculty, institute or centre: Department of Chemical Water Quality and Health

Other types of collaboration with researchers or technologists

Type of relationship: Joint project networks

Name principal investigator (PI, Co-PI...): Grégory Hoff; Anthony Arguelles-Arias; Victoria Osorio Torrens; Marc Ongena

Description of the collaboration: Study of surfactins metabolized by plant-growth promoting bacteria in the rizosphere zone that can be used in agriculture for crop protection purposes.

City: Liege, Belgium

Start date: 2017

Duration: 2 years

Relevant results: Surfactins and several surfactin variants were identified and structurally elucidated by HRMS. The outcomes allowed selecting the optimal bacteria growth conditions boosting the production of the more bioactive surfactin variants.

Identify key words: Mass spectrometry; Quality/metrology; Liquid chromatography (uv, luminiscence, ms, electrochemical, etc); Antibiotics; Isolation and structural determination; Natural resouces; Cultivation of agricultural land



Scientific societies and professional associations

- 1** **Name of the society:** Spanish Society for Quality Assurance in Research
Affiliation entity: Sociedad Española de Garantía de Calidad en Investigación, SEGCIB
Start date: 2020
- 2** **Name of the society:** Sociedad Española de Espectrometría de Masas
Start date: 2010

Editorial councils

Name of the editorial council: Guest editor for Toxics journal (MDPI)
Affiliation entity: MDPI
Tasks carried out: Guest editor
Start date: 02/2021

Other distinctions (professional or business career)

Description: Marie Sklodowska-Curie Actions Seal of Excellence (Quality label awarded to all proposals submitted to the MSCA Individual Fellowships Call that scored 85% or more but could not be funded from the call budget.)
Awarding entity: European Commission
Conferral date: 20/03/2019

Obtained accreditations/recognitions

Description: Lecturer in the field of science
Accrediting entity: AGENCIA PER A LA QUALITAT DEL SISTEMA UNIVERSITARI DE CATALUNYA
Date of reception: 05/03/2020
Date of recognition: 2020