CV date	

Part A. PERSONAL INFORMATION

First name	Marta		
Family name	Carballa		
Gender		Birth date (dd/mm/yyyy)	
ID number		URL Web: https://cretus.usc.es/marta-carballa-arcos/	
e-mail	marta.carballa@usc.es		
Open Research and Contributor ID (ORCID)		0000-0002-7409-0235	

A.1. Current position

Position	Associate Professor		
Initial date	27/04/2022		
Institution	University of Santiago de Compostela		
Department/Center	CRETUS – Department of Chemical Engineering		
Country	Spain	Teleph. number	
Key words	Anaerobic treatment, biorefinery, microbial ecology, organic micropollutants, solid wastes, volatile fatty acids, wastewaters		

A.2. Previous positions (research activity interruptions, art. 45.2.c))

Period	Position/Institution/Country/Interruption cause
01/03/2006 – 15/04/2007	Postdoctoral contract / Pontificia Universidad Católica de Valparaíso / Chile
01/05/2007 – 31/08/2009	Postdoctoral contract / Ghent University / Belgium
01/09/2009 – 11/03/2014	Postdoctoral contract / University of Santiago de Compostela / Spain
12/03/2014 – 21/12/2016	Interim Associate Professor / University of Santiago de Compostela / Spain
16/07/2018 – 30/01/2019	Maternity and nursing leave
22/12/2016 – 26/04/2022	Associate Professor / University of Santiago de Compostela

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Chemical Engineering	Santiago de Compostela/Spain	2001
PhD in Chemical and Environmental Engineering	Santiago de Compostela/Spain	2005

Part B. CV SUMMARY

After getting the Degree in Chemical Engineering in January 2001 at the University of Santiago de Compostela (USC), I immediately joined Biogroup (Group of Environmental Biotechnology) of the Chemical Engineering Department at USC, initiating the doctoral studies in Chemical and Environmental Engineering. During my PhD, I have conducted two research stays at the Federal Institute of Hydrology in Koblenz (Germany), defending my PhD thesis in December 2005 and obtaining the qualification of Outstanding Cum Laude, with European Doctorate mention and Extraordinary Doctorate Prize. In March 2006, I obtained a Contract for Young Researchers at the Pontificia Universidad Católica de Valparaíso (Chile) and in May 2007 I joined the Laboratory of Microbial Ecology and Technology of Ghent University (Belgium) as postdoctoral researcher, thanks to a postdoctoral contract of the Ministry of Education and Science of Spain and to the Ángeles Alvariño contract of the Xunta de Galicia. In December 2008, I rejoined the Biogroup, initially as Isidro Parga Pondal researcher, then as Ramón y Cajal researcher, later as Interim Substitution Professor and since December 2016 as Associate Professor.

During the first years (2001-2005), my research was focused on the removal of organic micropollutants in sewage treatment plants, especially during sludge anaerobic digestion. This work resulted in the first publications on this topic in South Europe and was the beginning of this research line (now consolidated) in Biogroup. During the postdoctoral research stays in Chile and Belgium (2006-2009), my research experience was extended to

other topics, such as the removal and recovery of nutrients or the study of the microbiome of anaerobic processes. The latter was one of my contributions upon my return to Biogroup. Since my re-incorporation into Biogroup (2009), my research has been focused on 2 main topics: anaerobic (co-) digestion processes, focused on relating the functionality of anaerobic digesters with the structure of the microbial community, and the identification and quantification of the removal mechanisms of organic micropollutants in biological wastewater and sludge treatment processes. In the last six-seven years, the line of anaerobic (co-) digestion has evolved towards the concept of biorefinery, and I am leading the research line focused on the targeted production of volatile fatty acids from residual streams. In the last 5 years, I have participated in 6 international research projects (1 as coordinator and 2 as principal investigator), 4 national research projects (3 as principal investigator), and 1 research contract with companies. All this activity has led to: 11 doctoral theses (3 in progress), 13 book chapters, >100 papers in high-impact indexed journals, such as Environmental Science and Technology, Water Research, Bioresource Technology, Science of the Total Environment, Waste Management, Chemical Engineering Journal or Journal of Hazardous Materials, and ~ 170 presentations at congresses, with ~ 100 oral presentations

As for academic activities, I am part of the Teaching Organization Plan of the Chemical Engineering Department of the USC from the academic year 2009-2010 with 120 annual hours and since 2014-15, with 240 annual hours. In addition, I have tutored 25 master theses and more than 16 research stays of foreign students (Portugal, Mexico, Germany, Chile, The Netherlands, Italy, Belgium, Brazil).

As for University Management, I was Coordinator of 5th year of Chemical Engineering from 2009 to 2014 and of Module IV "Research and Development" of the Master in Chemical Engineering and Bioprocesses from 2013 to 2015. Currently, I am the Coordinator of the 1st year of the Bachelor in Chemical Engineering. I am member of the Teaching and Quality Committee of the Department of Chemical Engineering of the USC since 2011 and coordinator of the Erasmus Program with the Faculty of Bioscience Engineering of Ghent University (Belgium) since 2013 and with the University of Brescia (Italy) since 2014.

I am currently a member of the Colegio de Ingenieras e Ingenieros Químicos of Galicia and the International Water Association (IWA). I am a reviewer of several international journals, and have participated as an expert in the evaluation of research projects for the National Commission of Scientific and Technological Research of Chile, for the National Agency for Evaluation and Prospective (ANEP) of the Ministry of Science and Innovation of Spain and for the National Fund of Research (FNR) of Luxembourg. I have been member of the Organizing Committee of the 13th World Congress on Anaerobic Digestion, 4th International Conference on Biogas Microbiology and 12th Micropol & Ecohazard Conference, and of the Scientific Committee of several national and international congresses.

Part C. RELEVANT MERITS

C.1. Publications

Kennes-Veiga, D.M., Trueba-Santiso, A., Gallardo-Garay, V., Balboa, S., Carballa, M. and Lema, J.M. (2022). Sulfamethoxazole enhances specific enzymatic activities under aerobic heterotrophic conditions: a metaproteomic approach. Environmental Science & Technology 56, 13152-13159.

Bevilacqua, R., Regueira, A., Mauricio-Iglesias, M., Lema, J.M. and Carballa, M. (2022). Chain elongation may occur in protein mixed-culture fermentation without supplementing electron donor compounds. Journal of Environmental Chemical Engineering 10, 106943.

Kennes-Veiga, D.M., Gonzalez-Gil, L., Carballa, M. and Lema, J.M. (2022). Enzymatic cometabolic biotransformation of organic micropollutants in wastewater treatment plants: a review. Bioresource Technology 344, 126291.

Bevilacqua, R., Regueira, A., Mauricio-Iglesias, M., Lema, J.M. and Carballa, M. (2021). Undestanding the effect of trace elements supplementation on volatile fatty acids production from proteins. *Journal of Environmental Chemical Engineering* 9, 105934.

Bevilacqua, R., Regueira, A., Mauricio-Iglesias, M., Lema, J.M. and Carballa, M. (2021). Steering the conversion of protein residues to volatile fatty acids by adjusting pH. *Bioresource Technology* 320, 124315.

Regueira, A., Bevilacqua, R., Mauricio-Iglesias, M., Carballa, M. and Lema, J.M. (2021). Kinetic and stoichiometric model for the computer-aided design of protein fermentation into volatile fatty acids. Chemical Engineering Journal 406, 126835.

C.2. Congress

6th IWA International Conference on eco-Technologies for Wastewater Treatment (ECOSTP2023). Martín, M., González-Gil, L., Balboa, S., Lema, J.M. and Carballa, M. Effect of HRT and dissolved oxygen on the fate of pharmaceutical compounds and antibiotic resistance genes in a high-rate activated sludge reactor. Oral presentation. Giroan (Spain). 26-29 June 2023.

4th International Conference on Biogas Microbiology (ICBM4). Vijande, C., Bevilacqua, R., Balboa, S., Mauricio-Iglesias, M. and Carballa, M. Influence of operational conditions on the microbiome responsible of the anaerobic fermentation of protein-rich sidestreams Oral presentation. Braga (Portugal). 9-11 May 2022.

12th Micropol and Ecohazard Conference 2022 (Micropol 2022). Kennes-Veiga, D.M., Balboa, S., Carballa, M. and Lema, J.M. Identifying key players involved in sulfamethoxazole and ibuprofen biotransformation under aerobic heterotrophic conditions. Oral presentation. Santiago de Compostela (Spain). 6 – 10 June 2022.

17th World Congress on Anaerobic Digestions: Biogas & Beyond (AD17). Bevilacqua, R., Mauricio-Iglesias, M., Balboa, S., Lema, J.M. and Carballa, M. Influence of sugar-to-protein ratio on the selectivity of mixed-culture cofermentation processes. Oral presentation. Ann-Arbon, Michigan (USA). 17 - 22 June 2022.

4th IWA Resource Recovery Conference 2021 (IWA RR2021). Regueira, A., Lema, J.M., Carballa, M. and Mauricio-Iglesias, M. Steering carbohydrate mixed-culture fermentations towards lactic acid assisted by resource allocation modeling. Oral presentation. Online (Istambul, Turkey). 5-8 September 2021.

C.3. Research projects

Diseño tecno-ambiental de una plataforma de biorrefinería, mediante modelos matemáticos, para valorizar residuos agroalimentarios en ácidos grasos volátiles de cadena impar (ODDITY) (2022-2024). Proyectos de Transición Ecológica y Digital 2021, Agencia Estatal de Investigación (TED2021-130289B-I00). Principal Investigator: Marta Carballa and Miguel Mauricio. Budget: 193,775.00 €.

Engineering microbial communities for the conversion of lignocellulose into medium-chain carboxylates (Cell4Chem) (2021-2024). Ministry of Science and Innovation (PCI2021-121989, ERACoBioTech 3rd call, grant 722361). Principal investigator: Marta Carballa. Budget: 150,000.00 €.

Potential of decentralized wastewater treatment for preventing the spread of antibiotic resistance, organic micropollutants, pathogens and viruses (PRESAGE) (2021-2024). Aquatic Pollutants JPI, Spanish Research Agency (PCI2021-121990). Principal investigator: Francisco Omil Prieto. Budget: 200,000.00 €.

Analysis of antibiotic resistance and antibiotic biotransformation in innovative plant layouts promoting recovery of carbon in the mainstream and sluge line (ANTARES) (2020-2023). Ministry of Science and Innovation (PID2019-110346RB-C21). Principal investigators: Francisco Omil and Marta Carballa. Budget: 227,000 €.

Management, coordination and valorization strategies of sludge and organic waste in the SUDOE region (ECOVAL) (2020-2023). Interreg SUDOE 2014-2020 Program (SOE4/P1/E1104). Principal investigator: Marta Carballa. Budget: 134,000 €.

Recovery of by-products and wastewater from the canning industry in the POCTEP space (CONSERVAL) (2019-2021). INTERREG V A Spain-Portugal, POCTEP (Operational Programme for Cross-border Cooperation Spain-Portugal), cofunded by ERDF (European Regional Development Fund) (Reference: 2352). Principal investigator: Marta Carballa. Budget: 162,426 €.

Recovery and utilization of nutrients 4 low impact fertilizer (RUN4LIFE) (2017-2021). European Commission (H2020-CIRC-02a-2016, reference: 730285-1). Principal investigator: Juan M. Lema. Budget: 434,257 €.

C.4. Contracts, technological or transfer merits

Convenio de colaboración entre la Entidad Pública Empresarial Aguas de Galicia y la Universidad de Santiago de Compostela (INNOVAUGAS) (2022). Xunta de Galicia (2022-CP060). Investigador principal: Mª Teresa Moreira. Importe: 338,316.00 €.

C.5. Participation in training activities

Master class *"Occurrence and fate of organic micropollutants in wastewater treatment plants"* (3 h). Leading Edge Summer Course "Management of micropollutants in the urban water cycle" organized by IRSTEA and INRA. Virtual. July 2021.

Master class *"Occurrence and fate of micropollutants in water treatment plants"* (1 h). Introductory Training School del European Joint Doctorate NOWELTIES organized by University of Santiago de Compostela (Biogroup and CRETUS). Santiago de Compostela (Spain). October 2019.

C.6. Participation in evaluation activities

Comission member of PhD theses

(nano) Materials for accelerating syntrophic fatty acids degradation to methane. Catia Sofía Neves Braga. Tesis doctoral en Ingeniería Química y Biológica. Universidade do Minho (Portugal). Septiembre 2023.

Knowledge integration to promote waste-to-PHA biorefineries. Mateo Saavedra del Oso. Tesis doctoral en Ingeniería Química y Ambiental. Universidad de Santiago de Compostela (España). Junio 2023.

Combining biogenic palladium nanoparticles with an electrochemical system for synthesis optimization and catalytic removal of micropollutants. Cindy Ka Y. Law. Tesis doctoral en Bioscience Engineering. Ghent University (Bélgica). Diciembre 2022.

Bio-based recovery of organic carbon from municipal waste streams. Isaac Owusu-Agyeman. KTH Royal Institute of Technology (Suecia). Abril 2022.

Combining forward osmosis and anaerobic membrane bioreactor technologies for raw municipal wastewater treatment. Federico Ferrari. Universidad de Girona (España). Octubre 2020.

Research projects evaluator

-*National Agency for Evaluation and Prospective* (ANEP) of the Ministry of Science and Innovation of Spain *(ANEP).* C

C.7. Member of international committees

Scientific committee

-*17th IWA World Congress on Anaerobic Digestion (AD17): biogas and beyond.* Ann-Arbor, Michigan (United States). 17-22 Junio 2022.

-*6th IWA Specialized International Conference EcoTechnologies for Wastewater Treatment (ecoSTP2023).* Girona (España). 26-29 Junio 2023.

Organizing committee

-*4th International Conference on Biogas Microbiology (ICBM4).* Braga (Portugal). May 2022.

-*12th Micropol & Ecohazard Conference 2021.* Santiago de Compostela (Spain). June 2022.