

MONICA BRIENZA

EDUCATION

International PhD in “BioEcosystems and BioTechnology

University of Basilicata (Italy) in co-tutelle with Université de Perpignan Via Domitia (France) (18 months in each University) 2011-2014
(Awarded

Name of PhD Supervisor: Laura Scrano and Vincent Goetz 12/03/2015)

Dissertation topic: **Solar Advanced Oxidation Processes for removing emerging contaminants in wastewater.**

Diplôme national de docteur Sciences de L'Ingenieur (French PhD)

Université de Perpignan Via Domitia 2011-2014
(Awarded

Name of PhD Supervisor: Laura Scrano and Vincent Goetz 12/03/2015)

Dissertation topic: **Solar Advanced Oxidation Processes for removing emerging contaminants in wastewater.**

University of Basilicata (IT)

- University Master's in “Theories and research methods in agro-environment” Potenza, Italy 2011

University of Basilicata (IT)

- Master in Forestry and Environmental Sciences, One-cycle degree Potenza, Italy 2009

RESEARCH EXPERIENCE

CURRENT POSITION(S)

02/08/2019-31/07/2022 *Research at fixed-term contract RTD-A* University of Basilicata (ITALY)

Projects “Technologies based on siliceous materials treated with sol-gel coating processes for water purification (TECOW)” and “Role of biofilms and the rhizosphere in the attenuation of pharmaceuticals and antibiotic resistance in irrigation whit wastewater” in collaboration whit INRAE G-EAU and HSM Montpellier.

PREVIOUS POSITIONS

01/11/2018 - 31/07/2019 *Post Doctorat* - University of Montpellier (France)- Montpellier University of Excellence (MUSE) Project “Rôle des biofilms et de la rhizosphère dans l'atténuation de l'occurrence de produits pharmaceutiques et de l'antibiorésistance lors de la réutilisation des eaux usées traitées en irrigation” in collaboration with Irstea G-EAU (Ait Mouheb Nassim), HSM Montpellier (Serge Chiron) and INRA LBE Narbonne (Nathalie Wery).

02/11/2016 - 31/10/2018 *Post Doctorat* - Institut de Recherche pour le Développement (IRD) (France)

“Risk assessment of contaminants in soil-crop systems, analytical chemistry, wastewater treatment and reuse”. Collaboration in “Assessing the fate of pesticides and water-borne contaminants in agricultural crops and their environmental risks-AWARE” and “Plateforme expérimentale de réutilisation d’eaux usées traitées en irrigation- AERMC” projects.

- The **AWARE** project aims to investigate the fate and potential reduction of pesticides and wastewater-borne contaminants in soil/plants from agricultural crops. Moreover, in the AWARE project we will evaluate environmental risks in agricultural fields due to the use of pesticides and the irrigation practices involving reused wastewater. Both pollution sources may have some inherent risks associated to food production.
(http://www.waterjpi.eu/index.php?option=com_content&view=article&id=549:aware&catid=15)

[6:joint-calls](#)).

- **AERMC** concerns the setting up an experimental platform to study the technical feasibility and evaluate the agronomic, sanitary and environmental impacts of a wastewater reuse for irrigation. The main objectives of this platform established in a Mediterranean context are (1) To fit wastewater treatments to usage, (2) To optimize the efficiency and durability of irrigation systems, (3) To valorize TWW from an agronomic point of view, (4) To control risks related to environmental and sanitary issues.

01/01/2016-31/08/2016 Marie Curie Post Doctorate Aristotle University of Thessaloniki (Greece) on Project of European Union FP7-People-IAPP-WaSClean-612250 “Water and Soil Clean-up from Mixed Contaminants- WaSClean” project. The *WaSClean* project aims to stimulate intersectoral collaboration to develop and scale-up comprehensive technology for the remediation of contaminated land from representative heavy metals (e.g. Pb, As, Cr, Cd, Hg), persistent organic pollutants (lindane, atrazine, obsolete pesticides), and synthetic dyes (reactive blue, red, black from textile industry). The project covers developing novel Fe/Cu/carbon clean-up devices, as well as utilizing sulfate-reducing, sulphur-oxidizing and iron-and-sulphur-oxidizing bacteria as well as advanced oxidation techniques for treatment of contaminated land and waters (<http://www.saske.sk/wasclean/>). My main topic was electrochemistry treatment for clean-up textile industrial wastewater and its reuse.

1/09/2015-24/10/2015 Visiting Guest Research. Plataforma Solar de Almería (Spain) Project “Solar photo-Fenton with persulfate at pilot scale for disinfection and for removal of emerging contaminants from domestic wastewater” funding by Solar Facilities for the European Research Area (SFERA) programme (<http://sfera2.sollab.eu/>). During this short visiting, my research topic was deals with disinfection. It is a hot topic that concern Mediterranean countries, especially, countries where often the water has not good biologic and chemical status. In this project, the goal was to remove bacteria using removable energy such as solar light for drive photocatalytic treatment.

15/11/2014-14/02/2015 Engineer contract. Centre national de la recherche scientifique (CNRS) (France), HSM and PROMES (Montpellier, Perpignan) on “Diffusion of nanotechnology based devices for water treatment and recycling- NANOWAT “1-B/2.1/049, Grant No.7/1997”, with financial assistance of European Union under the ENPI-CBC-MED Programme (www.nanowat.eu). *NANOWAT* project focuses on the experimentation, development and diffusion in the Mediterranean area of new technologies for efficient water treatment based on natural and modified nano-materials, using either filtration and sedimentation or photo-degradation, or their combination. This object was achieve in collaboration with University of Basilicata - Department of Agriculture, Forestry and Environment (Italy); Centre National de la Recherche Scientifique, Hydrosiences Montpellier (France); Spanish National Research Council, Institute for Natural Resources and Agrobiological (Spain) and The Hebrew University of Jerusalem (Israel).
Valorisation of the research is under “Déclaration of d’invention”(November 2020 the patent is still under submission, waiting for a final decision)

FELLOWSHIPS AND AWARDS

Nov 2021- Apr 2022 Fulbright Scholarship (Grant G-1-00005), School of Sustainable Engineering and The Built Environment, Arizona State University, Phoenix, Arizona.

Topic: Fipronil removal

Supervisor: Prof. Sergi Gargia Segura

Mar 2009-June 2009 Leonardo da Vinci Fellowship at Mgarr Local Council, Malta Topic “Use of the cypress in the protection of rural economy, the environment and the Mediterranean landscape: prevention and management of natural risks”. It was a scientific contribution to MedCyprus project.

SUPERVISION OF GRADUATE STUDENTS

Nov 2020 - Apr 2021 Supervision 1 Master Student

Farmacy One-cycle degree, Department of Science, University of Basilicata

Aug 2019 - Nov 2021 Supervision 1 PhD Student

International PhD "Applied Biology & Environmental Safeguard", XXXIV cycle, University of Basilicata

TEACHING ACTIVITIES

2020-2021 Geobiology: CFU: 6; total hours: 56 (24 practises and 32 lessons)

2020-2021 Erasmus+ Teaching No. 8h (through Microsoft Teams system) to University of Ioannina (Greece)

2021-2022 Assistant teaching for Environmental Engineering Processes Lab at Arizona State University, total hours 86 (practise and lessons), with Prof. Sergi Garcia Segura

INSTITUTIONAL RESPONSABILITIES

2020-2021 Member of Comitati Unici di Garanzia (CUG)

2020-2021 Treasurer of Associazione dei Ricercatori a Tempo Determinato (ARTeD)

REVIEWING ACTIVITIES

2021 Editorial Board: CATALYST (IF. 4.146) (https://www.mdpi.com/journal/catalysts/topic_editors)

2015-2021 Referee for international journals including *Journal of Hazardous Materials*, *Chemical Engineering Journal*, *Water Research*, *Catalysis Today*, *Separation and Purification Technology*, etc.

SKILLS and TECHNIQUES

- Emerging contaminants
- Analytical chemistry (HPLC/UV, LC-MS, LC/MS/MS)
- Bioassays
- Disinfection (i.e. *Escherica coli*, *Enterococcus feacalis*)
- Environmental risk assessment of contaminants
- Advanced Oxidation Processes
- Wastewater treatment and reuse
- Toxicity (i.e. *Vibrio fischeri*, *Daphnia magna*)
- **Winning proposals writing**, such as:
 - i) PRIMA project 2022-2025 SAFE "Sustainable water reuse practices improving safety in agriculture, food and environment" **250k€**, University of Basilicata, **PI and Coordinator**
 - ii) Resusemp³ Integrating nature-based water Reuse strategies with advanced Monitoring of the Presence and Impact of MicroPollutants and MicroPlastics. **Advisory Board in water reuse and micropollutants.**
 - iii) PRIMA project 2019-2022 INWAT "Quality and management of intermittent rivers and associated groundwater in the Mediterranean basins" **250k€**, University of Montpellier, partner.
 - iv) Assessing the fate of pesticides and water born contaminants in agricultural crops and their environmental risks – **AWARE**", project funding by Water JPI program-2016-2020, **280k€**, University of Montpellier, partner.
- Patent **FR 3 096 676 A1: Water treatment by solar advanced oxidation processes.**

- Languages: 1) **Italian** (native)
2) **English** fluent (reading, speaking, writing)
3) **French** Intermediate (speaking, reading, writing).

MAJOR COLLABORATIONS

Dir. Serge Chiron. 'Fate and removal of contaminants', HydroScience Montpellier, France

Dir. Vincent Goetz. 'Solar energy and Advanced Oxidation Processes', CNRS PROMES, Perpignan, France

Prof. Sergi Garcia Segura, 'Electrochemical process', Arizona State University

Prof. Ait Mouheb Nassim, 'Wastewater reuse', INRAE, Montpellier, France

Prof. Gianluigi Buttiglieri, 'Water treatment', ICRA, Spain

Prof. Antonio Zuurro and Prof. Roberto Lavecchia, Modelling and adsorption, Dept. of Chemical Engineering, Materials & Environment - "Sapienza" University, Italy

Prof. Sabino Aurelio Bufo, 'Water treatment', University of Basilicata, Italy

PUBLICATIONS

Peer-reviewed journal articles (citations 317, h-index 10)

- 1.** Foti L., Coviello, D., Zuurro, A., Lelario, F., Bufo, S.A., Scrano, L., Sauvetre, A., Chiron, S., Brienza M.* Comparison of sunlight-AOPs for levofloxacin removal: kinetics, transformation products, and toxicity assay on *Escherichia coli* and *Micrococcus flavus*, *Environmental Science and Pollution Research* (2022); doi: 10.1007/s11356-022-19768-w (**IF 4.223**)
- 2.** Coviello D., García-Martínez J.B., Buccione R., Scrano L., Barajas-Solano A.F., Brienza M.* Natural Clay-Based Materials for the Removal of Antibiotics from Contaminated Water, *Chemical Engineering Transactions* (2021) 88, ISBN 978-88-95608-86-0; ISSN 2283-9216
- 3.** Acquavia, M.A., Pascale, R., Foti, L., Colucci, G; Scrano, L., Martelli, G., Brienza, M, Coviello, D., Bianco, G., Lelario, F. Analytical methods for extraction and identification of primary and secondary metabolites of apple (*Malus domestica*) fruits: A review. *Separations* (2021) 8(7), 91 (**IF 2.777**)
- 4.** Gallego, S., Brienza, M., Béguet, J., Chiron, S., Martin-Laurent, F. Impact of repeated irrigation of lettuce cultures with municipal wastewater on soil bacterial community diversity and composition. *Environmental Science and Pollution Research* (2021) Jun 12. doi: 10.1007/s11356-021-14734-4. Epub ahead of print. PMID: 34117546 (**IF 4.223**)
- 5.** Manasfi, R., Brienza, M., Ait-Mouheb, N., Montemurro, N., Perez, S. Chiron, S. Impact of long-term irrigation with municipal reclaimed wastewater on the uptake and degradation of organic contaminants in lettuce and leek. *Science of the Total Environment* (2020) 142742 (**IF 7.963**)
- 6.** Brienza, M., Manasfi, R., Sauvetre, A., Chiron, S. Nitric oxide reactivity accounts for N-nitroso-ciprofloxacin formation under nitrate-reducing conditions. *Water Research* (2020) 185:116293 (**IF 11.236**)
- 7.** Manasfi, R., Chiron, S., Montemurro, N., Perez, S., Brienza, M*. Biodegradation of fluoroquinolone antibiotics and climbazole fungicide by *Trichoderma species*. *Environ Sci Pollut Res* (2020) 2020,27(18),23331-23341 (**IF 4.223**)
- 8.** Brienza, M., Manasfi, R., Chiron, S. Relevance of N-nitrosation reactions for secondary amines in nitrate-rich wastewater under UV-C treatment. *Water Research* (2019) 162:22-29 (**IF 11.236**)

- 9.** Brienza, M.*, Nir, S., Plantard, G., Goetz, V., Chiron, S. Combining micelle-clay sorption to solar photo-Fenton processes for domestic wastewater treatment. *Environ Sci Pollut Res* (2018) 10.1007/s11356-018-2491-3 (IF 4.223)
- 10.** Brienza, M., Chiron, S. Enantioselective reductive transformation of climbazole: A concept towards quantitative biodegradation assessment in anaerobic biological treatment processes. *Water Res.* 116 (2017) 203-210 (IF 11.236)
- 11.** Brienza, M., Duwig, C., Pérez, S. and Chiron, S. 4-nitroso-sulfamethoxazole generation in soil under denitrifying conditions: Field observations versus laboratory results. *J. Hazard. Mater.* 334 (2017) 185-192 (IF 10.588)
- 12.** Brienza, M.*, Katsoyiannis I.A. Sulfate radical technologies as tertiary treatment for the removal of emerging contaminants from wastewater. *Sustainability* 9 (2017), 1-18 (IF 3.251)
- 13.** Kacem, M., Plantard, G., Brienza, M., and Goetz, V. Continuous-flow aqueous system for heterogeneous photocatalytic disinfection of gram-negative *Escherichia coli*. *Ind. Eng. Chem. Res.* 56 (2017) 15001-15007 (IF 3.720)
- 14.** Brienza M.*, Mahdi Ahmed M., Escande A., Plantard G., Scrano L., Chiron S., Bufo, S. A. and Goetz V., "Use of solar advanced oxidation processes for wastewater treatment: follow-up on degradation products, acute toxicity, genotoxicity and estrogenicity", *Chemosphere*, 148 (2016) 473-480. (IF 7.086)
- 15.** Lelario F., Brienza M., Scrano L., Bufo S. A., "Effectiveness of different advanced oxidation processes (AOPs) on the abatement of the model compound mepanipyrim in water as determined using liquid chromatography coupled with electrospray ionization (LC/ESI) and Fourier-Transform Ion Cyclotron Resonance Mass Spectrometry (FTICR MS)", *Journal of Photochemistry and Photobiology A: Chemistry*, 321(2016) 187-201 (IF 4.291)
- 16.** Brienza M.*, Mahdi Ahmed M., Escande A., Plantard G., Scrano L., Chiron S., Bufo S. A. and Goetz V., "Relevance of a photo-Fenton like technology based on peroxymonosulphate for 17-beta-estradiol removal from wastewater", *Chemical Engineering Journal*, 257(2014)191–199. (IF 13.723)
- 17.** Mahdi Ahmed M., Brienza M., Goetz V., Chiron S., "Solar photo-Fenton using peroxymonosulfate for organic micropollutants removal from domestic wastewater: Comparison with heterogeneous TiO₂ photocatalysis", *Chemosphere*, 117(2014) 256–261 (IF 7.086)

Chapter book

- Brienza M., Özkal C.B., Li Puma G. (2018) Photo(Catalytic) Oxidation Processes for the Removal of Natural Organic Matter and Contaminants of Emerging Concern from Water. In: The Handbook of Environmental Chemistry. Springer, Berlin, Heidelberg. doi.org/10.1007/698_2017_189
- Castaño-Trias M., Brienza M., Tomei M.C., Buttiglieri G. (2020) Fate and Removal of Pharmaceuticals in CAS for Water and Sewage Sludge Reuse. In: The Handbook of Environmental Chemistry. Springer, Berlin, Heidelberg. http://doi-org-443.webvpn.fjmu.edu.cn/10.1007/698_2020_666
- Brienza M., Huerta B., Manasfi R., Chiron S. (2020) Soil Sorption and Degradation Studies of Pharmaceutical Compounds Present in Recycled Wastewaters Based on Enantiomeric Fractionation. In: The Handbook of Environmental Chemistry. Springer, Berlin, Heidelberg. https://doi.org/10.1007/698_2020_638

Short Communications in National and International Conferences

- 1.** Coviello D., García-Martínez J.B., Buccione R., Scrano L., Barajas-Solano A.F., Brienza M.* "Natural Clay-Based Materials for the Removal of Antibiotics from Contaminated Water"; 24th Conference on Process Integration for Energy Saving and Pollution Reduction, 31 Oct-03 Nov 2021, Brno, Czech Republic, oral presentation

- 2.** Brienza Monica, Manasfi Rayana, Chiron Serge "N-nitrosation of amines is a sink for NO in soil: Impact on denitrification" Xenowac II, 10th – 12th October 2018, Limassol, Cyprus
- 3.** Brienza Monica and Chiron Serge "*Enantioselective reductive transformation of climbazole: A concept towards quantitative biodegradation assessment in anaerobic biological treatment processes*" SETAC EUROPE, 7th-11th May 2017, Brussels
- 4.** Chiron Serge, Brienza Monica, Nir Shlomo, Goetz Vincent, "*Combining micelle-clay sorption to solar photo-Fenton for domestic wastewater treatment and water reuse in irrigation*". VIII Encontro sobre Aplicações Ambientais de Processos Oxidativos Avançados and II Congresso Iberoamericano de Processos Oxidativos Avançados, November 3th-6th, 2015, Belo Horizonte, Brazil (Oral Presentation)
- 5.** Brienza M., Mahdi Ahmed M., Escande A., Plantard G., Scrano L., Chiron S., Bufo S.A. and Goetz V., "*Use of solar advanced oxidation processes for wastewater treatment: follow-up of degradation products, acute toxicity and estrogenicity*". 3rd Water Research Conference, January 11th -14th , 2015, Shenzhen, China (Oral Presentation)
- 6.** Mahdi Ahmed M., Brienza M., Goetz V., Chiron S. "*Solar photo-Fenton using peroxymonosulfate or persulfate for organic micropollutants removal from domestic wastewater: Comparison with heterogeneous TiO₂ photocatalysis*" 3rd Water Research Conference, January 11th -14th , 2015, Shenzhen, China (Oral Presentation)
- 7.** Brienza M., Mahdi Ahmed M., Escande A., Plantard G., Scrano L., Chiron S., Bufo S.A. and Goetz V., "Effectiveness of AOPs processes for the removal of emerging contaminants from wastewater: the mepanipyrim case" 8th European Conference in Pesticides and Related Organic Micropollutants in the Environment. 14th Symposium on Chemistry and Fate of Modern Pesticides – Ioannina, Greece, September 18th - 21th, 2014, Volume: 1, 162-163. DOI:10.13140/2.1.3081.6009
- 8.** Brienza M., L. Scrano, F. Lelario, T. Trabace, S.A. Bufo. "*Effectiveness of AOPs processes on the removal of contaminants and their oxidation intermediates: the mepanipyrim case*". 248th ACS National Meeting & Exposition – San Francisco, August 10th-14th, 2014 (Oral presentation N. 338)
- 9.** Brienza M., Mahdi Ahmed M., Escande A., Plantard G., Scrano L., Goetz V., Chiron S. and Bufo S.A., "*Photocatalyse solaire pour l'élimination de contaminants émergents dans les eaux usées*". Journées Nationales sur l'Énergie Solaire (JNES2014) – Perpignan, July 8th-10th 2014 (Oral presentation)
- 10.** Brienza M., Mahdi Ahmed M., Escande A., Plantard G., Scrano L., Goetz V., Chiron S. and Bufo S.A., "*Solar photocatalysis as a final step for 17 β -estradiol removal in domestic wastewater effluent*". Third European Conference on Environmental Applications of Advanced Oxidation Processes (EAAOP -3) – Almeria, October 27th-30th, 2013 (Oral presentation No. 60).
- 11.** Brienza M., Mahdi Ahmed M., Plantard G., Scrano L., Goetz V., Chiron S. and Bufo S.A. "*Evolution of toxicity in an effluent containing hormone, Estradiol, during mineralization processes by heterogeneous photocatalysis and photo-Fenton*". In Book of Abstract 14th EuCheMS International Conference on Chemistry and the Environment (ICCE 2013) - Barcelona, June 25th -28th, 2013, p. 326 (Poster)
- 12.** Brienza M., Scrano L., Fraddosio Boccone L., Mancusi C., Lovallo M., Bove B., Bufo S.A. "*Agenti biodeteriogeni e beni culturali*". In: Book of Abstract XXVIII National Congress of the Italian Society of Agricultural Chemistry, Piacenza, Italy, September 20th -21th , 2010, p. 99.
- 13.** Brienza M., Scrano L., Mancusi C., Lovallo M., Bove B., Bufo S.A. "*Biomonitoring of atmospheric pollution using lichen bags in two Italian cities: Potenza and Matera*". In: Proceedings of 6th European Conference on Pesticides and Related Organic Micropollutants in the Environment, 12th Symposium on the Chemistry and Fate of Modern Pesticides, Matera Italy, 5-10 September 2010, pp. 183-185. ISBN 978-88-7522-098-3

- 14.** Brienza M., Scrano L., Mancusi C., Lovallo M., Bove B., Bufo S.A. *"Biodeteriogenic agents and cultural heritage"*. In: Book of Abstract 1st International Congress - Chemistry for cultural heritage (ChemCH) - Ravenna June 30th - July 3rd, 2010, p. 107 (Poster)

Potenza, 01/04/2022