



## CURRICULUM VITAE (CVA)

### Part A. PERSONAL INFORMATION

		<b>CV date</b>	February 2024
First name	Amaia		
Family name	Orbea		
Gender (*)	Female		
e-mail	amaia.orbea@ehu.eus	URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-0229-4482		

#### A.1. Current position

Position	Associate Professor		
Initial date	01/06/2011		
Institution	University of the Basque Country (UPV/EHU)		
Department/Center	Zoology and Animal Cell Biology Fac. of Science and Technology / Plentzia Marine Station (PIE)		
Country	Spain	Teleph. number	946012735
Key words	Cell Biology, Environmental Toxicology, Organic Pollutants, Nanomaterials, Micro- & nanoplastics, Biomarkers, Zebrafish, Aquatic Organism		

#### A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
2001-2004	Contracted researcher (part time), UPV/EHU, Spain
2001-2011	Assistant professor, UPV/EHU, Spain

#### A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licensed Biology	UPV/EHU, Spain	1994
PhD Biology	UPV/EHU, Spain	2001

### Part B. CV SUMMARY (max. 5000 characters, including spaces)

She started her research career in 1991 as undergraduate student in the laboratory of Cytology and Histology of the Faculty of Sciences of the UPV/EHU. As result of that training period, she published her first article in an international journal in 1996 on the use of changes in the lysosomal system of mussels as biomarker of environmental stress. After completing the Degree in June 1994, she defended her Licenciature Thesis work in December 1994 on the use of peroxisome proliferation in mussels as biomarker of exposure to petroleum derivatives, obtaining the highest rating. This work contributed greatly to the development of peroxisome proliferation as exposure biomarker to organic pollutants in aquatic organisms and resulted into two international papers. In October 1995 (until 1999) she got a predoctoral grant from the Basque Government and conducted the Thesis on peroxisome proliferation and antioxidant enzymes in aquatic organisms as biomarkers of organic pollutants. She performed research stays in the Univ of Heidelberg (Germany), CID-CSIC (Barcelona) and AZTI Foundation (Bizkaia). She defended the Thesis in January 2001 (Cum Laude) and she was incorporated as a part-time associate professor of Cell Biology. Until February 2004, when became full-time lecturer, she combined teaching with research contracts. Between 2003 and 2007, her main research focused on the assessment of the effects of the Prestige oil spill on aquatic organisms and on the carcinogenic and genotoxic potential of environmental pollutants. From 2008, she started working on the evaluation of the toxicity of nanomaterials to aquatic organisms, and more recently on the environmental impact of micro- and nanoplastics with funding from the European Commission, the National Plan and the Basque Government. She has been the PI of the UPV/EHU subproject of JPI Oceans "Plastox" projects and the co-PI of the MINECO project NACE CTM2016-81130-R. She is



currently co-PI of the MICIN projects FEIRA (PID2021-128600OB-I00) and ENSURE2 (TED2021-131147B-I00). Since its beginning in 2001, she is a member of the Research Group A "Cell Biology in Environmental Toxicology (BCTA)" recognized by the Basque Government, participating uninterruptedly in projects funded by the Basque Government, through the National Plan and the European Commission (BEEP project -V FP Environmental Programme-Marine Ecosystems, 2001-2004-, PRAGMA-VI FP project, Environment DG, 2006-2007- and NANORETOX project -VII FP, Nanosciences, Nanotechnologies, Materials and new Production Technologies, PLASTOX project -JPI Oceans call-, GRACE project -H2020 BG-2014-2015/BG2015-2). She teaches in the official master of the UPV/EHU "Environmental Contamination and Toxicology" and in three Erasmus Mundus masters ("Marine Environment and Resources", "Marine Biological Resources" and "Environmental Contamination and Toxicology") where she has supervised 12 Master Theses. Currently, she is elected Director of the Department of Zoology and Animal Cell Biology (UPV/EHU) and she was Academic Secretary between 2017 and 2022. Research 6-yr terms: 4 (last: 2014-2019). Supervised PhDs: 4 completed (1 in co-tutelle with U. Bordeaux) and 1 ongoing. Total N. citations: 2243 (WoS). Average N. citations/yr 2017-2021: 142,4. N. publications in Q1 (WoS): 31 (out of 48). H index (WOS): 28. She holds two national patents and has presented 92 communications to international scientific conferences and 26 communications to national scientific conferences. Evaluation of the Teaching Quality through Docentiaz program of the UPV/EHU: Excellent (2022). She was evaluator of Scientific projects for "Ministerio de Ciencia, Tecnología e Innovación Productiva, Fondo para la Investigación Científica y Tecnológica (FONCYT)", Argentina, 2016. Member of the Organizing Committee of the 28<sup>o</sup> Congress of the European Society for Comparative Physiology and Biochemistry. Bilbao (Spain), 2-5 September, 2012. She is reviewer of international scientific publications (19 international journals). Member of the Committee for Ethics in Animal Experimentation of the UPV/EHU from 2012 to 2020. Member of the Basque Committee of Marine Litter.

## Part C. RELEVANT MERITS

### C.1. Publications (2018-2022)

- 1.- J. Ibarretxe, L. Alonso, N. Aranburu, G. Guerrica-Echevarría, A. Orbea, M. Iturrondobeitia (2022) Sustainable PHBH-alumina nanowire nanocomposites: properties and Life Cycle Assessment. *Polymers*, 14: 5033
- 2.- I. Martínez-Álvarez, K. Le Menach, M. H. Devier, M. P. Cajaraville, A. Orbea, H. Budzinski (2022) Sorption of benzo(a)pyrene and of a complex mixture of petrogenic PAHs onto polystyrene microplastics. *Frontiers in Environmental Chemistry*, 3: 958607
- 3.- I. Martínez-Álvarez, K. Le Menach, M. H. Devier, M. P. Cajaraville, H. Budzinski, A. Orbea (2022) Screening of the toxicity of polystyrene nano- and microplastics alone and in combination with benzo(a)pyrene in brine shrimp larvae and zebrafish embryos. *Nanomaterials*, 12 (6): 941
- 4- A. Orbea, E. Bilbao & M. P. Cajaraville (2022) Assessing adverse effects of legacy and emerging contaminants in fish using biomarker analysis and histopathology in active monitoring scenarios. In: *In situ* bioavailability and toxicity. Protocols series "Methods in Pharmacology and Toxicology". M. Brinkmann & T.B. Seiler (Editors), Springer (in press)
- 5- R. von Helffeld, M. Zarzuelo, B. Zaldibar, M. P. Cajaraville, A. Orbea (2022) Accumulation, depuration, and biological effects of polystyrene microplastic spheres and adsorbed cadmium and benzo(a)pyrene on the mussel *Mytilus galloprovincialis*. *Toxics*, 10: 18.
- 6- A. Esteban-Sánchez, S. Johann, D. Bilbao, A. Prieto, H. Hollert, T-B. Seiler, A. Orbea (2021) Multilevel responses of adult zebrafish to crude and chemically dispersed oil exposure. *Environmental Sciences Europe*, 33: 106
- 7- I. Martínez-Álvarez, K. Le Menach, M. H. Devier, I. Barbarin, R. Tomovska, M. P. Cajaraville, H. Budzinski, A. Orbea (2021) Uptake and effects of graphene family materials alone and in combination with polycyclic aromatic hydrocarbons on zebrafish. *Science of the Total Environment*, 775: 145669
- 8- J. M. Lacave, E. Bilbao, D. Gilliland, F. Mura, L. Dini, M. P. Cajaraville, A. Orbea (2020) Bioaccumulation, cellular and molecular effects in adult zebrafish under exposure to CdS quantum dots and ionic cadmium. *Chemosphere*, 238: 124588.
- 9- N. González-Soto, J. Hatfield, A. Katsumiti, N. Duroudier, J. M. Lacave, E. Bilbao, A. Orbea, E. Navarro, M. P. Cajaraville (2019) Impacts of dietary exposure to different sized polystyrene microplastics alone and with sorbed benzo[a]pyrene on biomarkers and whole organism responses in mussels *Mytilus galloprovincialis*. *Science Total Environment*, 684: 548-566.



- 10- J. M. Lacave, U. Vicario-Parés, E. Bilbao, D. Gilliland, F. Mura, L. Dini, M. P. Cajaraville, A. Orbea (2018) Waterborne exposure of adult zebrafish to silver nanoparticles and to ionic silver results in differential silver accumulation and effects at cellular and molecular levels. *Science of the Total Environment*, 642: 1209-1220.
- 11- U. Vicario-Parés, P. Reip, M. P. Cajaraville, A. Orbea (2018) Cellular effects and changes in the liver transcriptome of adult zebrafish exposed to CuO nanoparticles. *Ecotoxicology*, 27: 89-101.
- 12- A. de los Ríos, B. Echavarrri-Erasun, M. H. Dévier, K. Le Menach, M. H. Budzinski, M. Ortiz-Zarragoitia, A. Orbea, J. A. Juanes, M.P. Cajaraville (2018) Título: Assessment of the effects of discontinuous sources of contamination through biomarker analyses on caged mussels. *Science of the Total Environment*, 634: 116-126

## C.2. Congress

### 30th Annual Meeting of SETAC Europe on "Responsible and Innovative Research for Environmental Quality". On line, 2020.

- 1.- A. Esteban-Sánchez, S. Johann, D. Bilbao, A. Prieto, T.-B. Seiler, A. Orbea "Influence of a chemical dispersant on oil toxicity: a multilevel approach in adult zebrafish" (Poster: A. Orbea)
  - 2.- I. Martínez-Álvarez, K. Le Menach, M.H. Devier, R. Tomovska, M.P. Cajaraville, H. Budzinski, A. Orbea. "Effects of graphene oxide alone and with adsorbed PAHs to zebrafish" (Poster: A. Orbea)
- ### International conference MICRO 2018 on "Fate and Impact of Microplastics: Knowledge, Actions and Solutions" Lanzarote, 2018.
- 3.- I. Martínez-Alvarez, K. Le Menach, M.-H. Devier, M. P. Cajaraville, H. Budzinski, A. Orbea. Assessment of the cellular and molecular consequences of the so-called "Trojan Horse" effect in adult zebrafish using PAH-contaminated polystyrene microplastics (Poster: A. Orbea)
  - 4.- N. González-Soto, A. Katsumiti, N. Duroudier, A. Orbea, E. Bilbao, E. Navarro and M. P. Cajaraville. "Impact of microplastics alone or with adsorbed compounds from the water accommodated fraction of a North Sea crude oil on marine mussels *Mytilus galloprovincialis*. (Póster: N. González-Soto)
  - 5.- J. Hatfield, N. González-Soto, A. Katsumiti, N. Duroudier, J. M. Lacave, A. Orbea, E. Navarro, M. P. Cajaraville. "Effects of exposure to microplastics alone and with adsorbed benzo(a)pyrene on marine mussels *M. galloprovincialis* at cell, tissue and physiological levels" (Oral: M. P. Cajaraville)
  - 6.- A. Booth, L. Sørensen, E. Rogers, I. Salaberria, P. Sobral, L. Airoidi, G. Zanaroli, A. Orbea, N. González-Soto, A. Katsumiti, M.P. Cajaraville, D. Altin. PLASTOX WP4: Microplastic-associated pollutants: effects and food web transfer. (Oral: A. Booth)

### 11º Congreso Ibérico y 8º Iberoamericano de Contaminación y Toxicología Ambiental sobre "La protección ambiental en un mundo global y cambiante: retos tecnológicos, científicos y sociales" Madrid, 2018.

- 7.- M. P. Cajaraville, I. Martínez-Álvarez, J. Hatfield, G. Nicolussi, N. González-Soto, A. Katsumiti, E. Bilbao, E. Navarro, R. Tomovska, H. Budzinski, A. Orbea. Nanomaterials and microplastics as carriers of persistent organic pollutants in the aquatic environment: development of tools for risk assessment based on alternative methods and model organisms. (Oral: M. P. Cajaraville)

### 28th Annual Meeting of SETAC Europe on "Responsible and Innovative Research for Environmental Quality" Rome, (2018).

- 8.- N. Gonzalez-Soto, A. Esteban-Sánchez, A. Orbea "Assessment of the biological impact of using chemical dispersants to remediate oil spills in different environmental conditions using zebrafish embryos" (Poster: A. Orbea)
- 9.- I. Martínez-Álvarez, K. Le Menach, M.H. Devier, M.P. Cajaraville, A. Orbea, H. Budzinski. "Characterization of the adsorption/desorption of benzo(a)pyrene to/from polystyrene nano- and microplastics for further toxicity assessment" (Poster: I. Martínez-Álvarez)

### Future Earth Oceans Knowledge-Action Network Workshop. Kiel, 2016.

- 10.- R. Sempere, A. Booth, K. Sakaguchi-Söder, P. Sobral, L. Airoidi, J. A. Van Franeker, K. Magnusson, T. Doyle, L. Morrision, I. Salaverria, C. Van Colen, D. Herzke, A. Orbea, G. W. Gabrielsen, H. Nies, T. Galloway, A. van Oyen. "Microplastics and associated contaminants in the Ocean, a major issue: The Plastox JPI European project." (Poster: R. Sempere)

## C.3. Research projects



- 1- Project: ENvironmental Safety of polyUrethanes from Renewable sources and from REcycled plastics: hazard assessment based on a battery of alternative methods (ENSURE2). Participation: Principal Researcher. Funder: MCIIN. Duration: 2022-2024. 212.750 €.
- 2- Project: “Biología Celular en Toxicología Ambiental BCTA/Cell Biology in Environmental Toxicology + One Health (CBET+)” Consolidated Research Group. Participation: Researcher. PI: Maren Ortiz. Funder: Basque Government. Duration: 2022-2025. 304.000 €.
- 3- Project: Fate and Impact of Environmentally ReAListic nanoplastics and of novel bioplastics in the aquatic environment (FIERA). Participation: Principal Researcher. Funder: MCIIN. Duration: 2022-2025. 212.750 €.
- 4- Project: Microplásticos en moluscos y peces del País Vasco de interés para el consumo humano. Participation: Researcher. PI: M. P. Cajaraville (UPV/EHU). Funder: Basque Government. Duration: 2022. 20.000 €.
- 5- Project: What role can play omics as a tool for risk assessment and environmental monitoring? (OMICS4TOOL). Ref: 2021/1/072. Participation: Researcher. PI: Frédérique Courant (U. Montpellier). Funder: ANSES (French Risk Assessment Agency). Duration: 2021-2024. 199.889 € (32.032 € UPV/EHU).
- 3- Project: “Novel nanodrugs for photodynamic therapy of cancer: physico-chemical and toxicological characterization (NANOPHOTOTOX), Ref: COLAB19/01. Participation: Researcher. PI: M. P. Cajaraville (UPV/EHU). Funder: UPV/EHU. Duration: 2020-2022. 21.300 €.
- 6- Project: “Cell Biology in Environmental Toxicology” Consolidated Research Group (type A). Last ref: IT1302-19. Participation: Researcher. PI: M. P. Cajaraville (UPV/EHU). Funder: Basque Governemt. Duration: 2019-2021 347.000 €; 2013-2018 491.998 €; 2007-2012 448.891,39 €.
- 7- Project: Nanomateriales como vehículos de contaminantes orgánicos persistentes en el medio acuático: desarrollo de herramientas para la evaluación del riesgo basadas en métodos alternativos y organismos modelo –NACE-, Ref: CTM2016-81130-R. Participation: Principal Researcher. Funder: MINECO. Duration: 2016-2021. 237.160 €
- 8- Project: Integrated oil spill response actions and environmental effects – GRACE. Participation: Researcher. PI: Kirsten S. Jørgensen (Finnish Environment Institute SYKE). Funder: European Commission H2020. Work programme topic BG-07-2015. Duration: 2016-2018. 325.000 €
- 9- Project: Direct and indirect ecotoxicological impacts of microplastics on marine organisms. Ref: Plastox, Preproposal ID16. Participation: Principal researcher (Subproject UPV/EHU). PI: Andy Booth (SINTEF, Norway), Call: JPI Oceans. Duration: 01/01/2016 to 31/12/2018. In kind contribution.
- 10- Project: Propuesta a Diputación Foral de Bizkaia de apoyo al PiE- UPV/EHU EMBRC (European Marine Biological Resource Centre). Participation: Researcher. PI: Iban Cancio (UPV/EHU). Funder: Diputación Foral de Bizkaia. Duration: 1/1/2015 to 31/12/2016, 227.000 €
- 11- Project: Mecanismos de acción y toxicidad de nanopartículas de plata en organismos modelo acuáticos y terrestres utilizando tecnologías ómicas (NanoSilverOmics). Ref: MAT2012-39372. Participation: Researcher. PI: M. P. Cajaraville (UPV/EHU). Funder: MINECO. Duration: 01/01/2013 to 31/12/2015. 52.650 €
- 12- Project: Determinación del potencial genotóxico y carcinogénico de las nanopartículas metálicas mediante la utilización de métodos alternativos in vitro e in vivo con peces cebrá e invertebrados (NANOCANCER). Ref: CTM2009-13477. Participation: Researcher. PI: M.P. Cajaraville (UPV/EHU). Funder: MINECO. Duration: 01/01/2010 to 31/12/2012. 38.731,10 €

#### **C.4. Contracts, technological or transfer merits**

- 1- Contract: JRC/IPR/2021/VLVP/2824 - Biological samples from UPV University - Ares(2021)6677791. Participation: Researcher. PI: Miren P. Cajaraville (UPV/EHU). Funder: EU Commision. 2021-2022, 15.000 €
- 1- Contract: JRC/IPR/2022/VLVP/1177 - Purchase biological samples from UPV/EHU University. Participation: Researcher. PI: Miren P. Cajaraville (UPV/EHU). Funder: EU Commision. 2021-2022, 15.000 €
- 2-Contract: BioVulMa Utilización de biomarcadores para el establecimiento de criterios para la valoración de la vulnerabilidad de las masas de agua sometidas a vertidos urbanos e industriales. Participation: Researcher. PI: M. P. Cajaraville (UPV/EHU). Funder: U. Cantabria. 2011-2012. 15.262 €
- 3.- Spanish Patents ES 2 392 604 B1 and ES 2 398 811 B1 “Método para la identificación del sexo en peces” de la Universidad del País Vasco/Euskal Herriko Unibertsitatea. 05/09/2013 and 21/04/2014.