CURRICULUM VITAE

Part A. PERSONAL INFORMATION

CV date	2019-07-01

First and Family name	MIREIA IRAZOLA DUÑABEITIA		
Social Security, Passport, ID number	78937381 R	Age	32
Researcher numbers	Researcher ID	H-8295-2017	
	Orcid code	0000-0001-8321-5434	

A.1. Current position

Name of University/Institution	University of the Basque Country (UPV/EHU)		
Department	Analytical Chemistry		
Address and Country	Barrio Sarriena S/N		
Phone number	+34 946017676	E-mail	mireia.irazola@ehu.eus mireia.irazola@gmail.com
Current position	PhD RESEARCHER	From	2017-07-07
Espec. cód. UNESCO	2301 Analytical Chemistry		
Palabras clave	METABOLOMICS; NMR; GAS CHROMATOGRAPHY; HIGH RESOLUTION MASS SPECTROMETRY; UPLC - Q Exactive HF; CHEMOMETRICS; RAMAN AND INFRARED IMAGING; SEM-EDX; CANCER; ENVIRONMENTAL ANALYSIS; MUSSELS, IN SITU ANALYSIS; WALL PAINTINGS; BIOMARKER; SILEX; SERS		

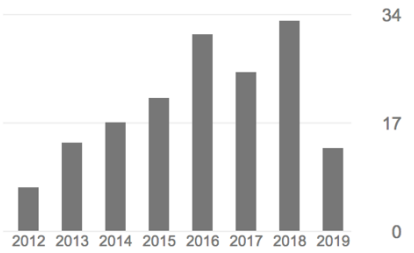
A.2. Education

Master Degree in Teacher Training in Compulsory Secondary and Upper Secondary School Education	Isabel I University, Burgos , Spain	2016-2017
PhD in Environmental Toxicology and Chemistry	University of the Basque Country (UPV/EHU)	2012-2016
Master in Environmental Contamination and Toxicology	University of the Basque Country (UPV/EHU)	2010-2011
Bachelor of Science in Chemistry	University of the Basque Country (UPV/EHU)	2004-2010

A.3. JCR articles, h Index

For citation metrics, see Google Scholar:

	Total	Desde 2014
Citas	163	140
Índice h	8	6
Índice i10	7	5



Part B. CV SUMMARY *(max. 3500 characters, including spaces)*

Since I obtained my Bachelor in Chemistry in 2010, the curiosity and multidisciplinary work spirit lead my research life. In the last year of the Bachelor I collaborated in the Analytical Chemistry Dept. working together with PhD Maitane Olivares. During that year I collaborated in the development of destructive analysis (GC-MS, GCxGC-MS) to find specific biomarkers and non-destructive analysis (Raman, FTIR) of geological chert samples.

Afterwards I accomplished the Master in Environmental Contamination and Toxicology master in the Analytical Chemistry Dept. (UPV/EHU) while I was hired as researcher in the CTP09-P04 project to accomplish analysis of wall paintings using non-destructive (Raman, FTIR, imaging) and micro-destructive (SEM-EDX) techniques.

Once I got the master, I obtained a grant from the UPV/EHU to do my PhD studies. In the doctoral thesis (in the manuscript), three analytical issues were resolved. The first one was the application of NMR measurements of mussels tissues and biofluids to accomplish an environmental metabolic study. The second was carried out in the framework of the magnetic hyperthermia treatment based on the use of nanoparticles. In this case, we tackled two objectives, the application of Raman and FTIR

hyperspectral imaging to distinguish healthy and tumour tissues, and the application of NMR based metabolomic analysis of liver and tumour tissues to understand the mechanisms of the treatment to figure out if the effects of the therapy. The last one was the study of SERS tags to develop hyperspectral imaging in live cell cultures.

During the PhD studies I did a short stay at the University of Copenhaguen to learn about chemometrics and the use/programming of Matlab. The type of chemometric tools that I use are PCA, PLS, (O)PLS-DA and MCR-ALS to work with two- and three-way array data. The second stay was at Strathclyde University in the Centre for Nanometrology (Glasgow, Scotland) where I worked in the synthesis of nanoparticles, the functionalitation of nanoparticles with organometallic complexes with biomedical interest, cell culture of CHO cells and in 2D and 3D imaging to image the uptake of the functionalized nanoparticles using SERS. In addition, during my PhD I have also collaborated in the development of several analytical methods to determine microplastics in mussels using Raman spectroscopy and to determine trace elements in human hair using ICP-MS and SEM-EDX among others.

During the academic course of 2016/2017, I did my Master Degree in Teacher Training in Compulsory Secondary and Upper Secondary School Education at the Isabel I University while I was working as a researcher in the Analytical Chemistry Dept. and PiE-UPV/EHU.

Lately, I focused my research career on analysing biological samples for metabolomics studies and on studying the contaminants uptake using the UPLC-Orbitrap. Meanwhile, for six months I worked as a University teacher at UPV/EHU in the Applied Chemistry Department.

Along my research career, I have contributed to the publication of 15 scientific articles in prestigious international journals and I have taken part in the dissemination of the obtained results in international and national conferences. Regarding the dissemination of science for society, I have collaborated in the divulgation of the obtained results giving talks at Scientific, Technology and Innovation week of Bilbao and I am part of the divulgation group of PiE-UPV/EHU.

Part C. RELEVANT MERITS

C.1. Publications

(15) E. Blanco-Rayón, L. Guilhermino, M. Irazola, A.V. Ivanina, I.M. Sokolova, U.Izagirre, I. Marigómez. The influence of short-term experimental fasting on biomarker responsiveness in oil WAF exposed mussels. Aquatic Toxicology, 206 (2019) 164–175.

(14) H. Ziarrusta, L. Mijangos, S. Picart-Armada, M. Irazola, A. Perera-Lluna, A. Usobiaga, A. Prieto, N. Etxebarria, M. Olivares, O. Zuloaga. Non-targeted metabolomics reveals alterations in liver and plasma ofgilt-head bream exposed to oxybenzone. Chemosphere (2018), 211, 624-631.

(13) H. Ziarrusta, L. Mijangos, M. Irazola, A. Prieto, N. Etxebarria, E. Anakabe, M. Olivares, O.Zuloaga. Ciprofloxacin by-products in seawater environment in the presence and absence of gilt head bream. Chemosphere (2018), 197, 560-568.

(12) I. Costantini, M. Veneranda, M. Irazola, J. Aramendia, K. Castro, J. M. Madariaga. The green grass was never green: How spectroscopic techniques should have assisted restoration Works. Microchemical Journal (2018), 138, 154–161.

(11) O. Posada-Ureta, M. Olivares, A. Delgado, A. Prieto, A. Vallejo, M. Irazola, A. Paschke, N. Etxebarria. Applicability of polydimethylsiloxane (PDMS) and polyethersulfone (PES) as passive samplers of more hydrophobic organic compounds in intertidal estuarine environments. Science of Total Environment (2017), 578, 392-398.

(10) O. K. Arriortua, E. Garaio, B. Herrero de la Parte, M. Insausti, L. Lezama, F. Plazaola, J. A. García, J. M. Aizpurua, M. Sagartzazu, M. Irazola, N. Etxebarria, I. García-Alonso, A. Saiz-López, J. J. Echevarria-Uraga. Antitumor magnetic hyperthermia induced by RGD-functionalized Fe3O4 nanoparticles, in an experimental model of colorectal liver metastases. Beilstein Journal of Nanotechnology (2016), 7, 1532-1542.

(9) J. C. Raposo, P. Navarro, A. Sarmiento, E.Arribas, M. Irazola, R. M. Alonso. Analytical proposal for trace element determination in human hair. Application to the Biscay province population, northern Spain. Microchemical Journal (2014), 116, 125-134.

(8) M. Veneranda, M. Irazola, A. Pitarch, M. Olivares, A. Iturregui · K. Castro, J. M. Madariaga. Raman spectroscopic study of the degradation of a middle age mural painting: The role of agricultural activities. Journal of Raman Spectroscopy (2014), 45, 1110-1118.

(7) M. Veneranda, M. Irazola, M. Díez, A. Iturregui, J. Aramendia, K. Castro, J.M. Madariaga. In-situ and laboratory Raman analysis in the field of cultural heritage: The case of a mural painting. Journal of Raman Spectroscopy (2014), 45, 228-237.

(6) M. Olivares, M. Irazola, X. Murelaga, J.I. Baceta, A. Tarriño, K. Castro, N. Etxebarria. Sourcing sedimentary cherts with archaeological use through the combination of chromatographic and spectroscopic techniques. Applied Geochemistry (2013), 33, 252-259.

(5) K. Castro, U. Knuutinen, S. Fdez-Ortiz de Vallejuelo, M.Irazola, J. M. Madariaga. Finnish wallpaper pigments in the 18th-19th century: Presence of KFe3(CrO4)2(OH)6 and odd pigment mixtures. Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy (2013), 106, 104-109.

(4) M. Irazola, M. Olivares, K. Castro, M. Maguregui, I. Martínez-Arkarazo and J.M. Madariaga. In-situ Raman spectroscopy analysis combined with Raman and SEM-EDS imaging to assess the conservation state of 16th century wall paintings. Journal of Raman Spectroscopy (2012), 43, 1676-1684.

(3) M Olivares, A Larrañaga, M Irazola, A Sarmiento, X Murelaga, N Etxebarria. Non-destructive crystal size determination in geological samples of archaeological use by means of infrared spectroscopy. Talanta (2012), 98, 172-177.

(2) M. Olivares, M. Irazola, A. Vallejo, X. Murelaga, O. Zuloaga, N. Etxebarria. Comprehensive two dimensional gas-chromatography to characterize hydrocarbon mixtures in lithic materials. Journal of Chromatography A (2011), 1218, 1656-1662.
(1) M. Olivares, A. Vallajo, M. Irazola, X. Murelaga, J. I. Baceta, A. Tarriño, N. Etxebarria. Optimisation of focused ultrasound extraction (FUSE) and microwave-assisted extraction (MAE) of hydrocarbons in geological chert samples. Talanta (2010), 83, 605-612.

C.2. Research projects and grants

- IBeA en medio ambiente físico, urbano construido, recursos naturales y salud (grupo consolidado tipo a, EJ-GV (IT1213/19), Gobierno Vasco (EJ-GV), IP: Juan Manuel Madariaga, financial funding of 493500 €.
- MAROMEGA, nuevas alternativas para la producción de Omega-3 a partir de recursos marinos (KK-2016/00057), Basque Government (EJ-GV), IP: Iciar Martinez, financial funding of: 259507,9 €
- Minimización de la problemtica del mercurio del atún y valorización del atún como alimento saludable (SELATUN, RTC-2014-2837-2), Ministerio Español de Economía y Competitividad, Programa Retos-Colaboración 2014, IP: Iciar Martinez, financial funding of: 544403,85 €
- Myoglobin analysis in tuna samples, Company contract, financial funding of: 8941,18 €
- Estudio de ozonización de aguas de abastecimiento de la estación de tratamiento de aguas potables de Iruña-Pamplona, Company contract, financial funding of: 4117,65 €
- Aproximación analítica para medir 1-pireno, 1-OH-pireno y fenil-1-O-glucurónido en muestras biológicas, Company contract, financial funding of: 3025,00 €
- Desarrollo de un sistema avanzado y sostenible para la cría en cautividad del múgil (AKURA, 33-2017-00250), Basque Government (EJ-GV), IP: Pilar Brettes (GAIKER)
- Novel methodologies to assess the impact of emerging contaminants on marine ecosystems and food consumers (CTM2014-56628-C3- 1-R), MINECO (Spanish Government), IP: Nestor Etxebarria, financial funding of 140000 €.
- IBeA en medio ambiente físico, urbano construido, recursos naturales y salud (grupo consolidado tipo a, EJ-GV) (IT-742-13), Gobierno Vasco (EJ-GV), IP: Juan Manuel Madariaga, financial funding of 601798 €.
- Los recursos naturales en el patrimonio arquitectónico de las zonas de montaña: explotación, utilización, análisis y puesta en valor (CTP09-P04), Gobierno Vasco (EJ-GV), Communauté de Travail des Pyrénées (CTP), IP: Kepa Castro, financial funding of 76000 €.
- Support for a 3-month stay to develop the research work related with SERS (Surface Enhanced Raman Spectroscopy) for bioimaging and biosensing at Strathclyde Universtity, Centre for Nanometrology (Glasgow, Scotland) for implementing the training program grants to Predoctoral researchers (University of the Basque Country, 2014).
- Predoctoral (PhD) fellowship, 01/01/2012-31/12/2015, (University of the Basque Country). Analytical Chemistry Department, Science and Technology Faculty, University of the Basque Country (UPV/EHU). Doctoral thesis project: Analytical and Chemometrical approaches for Bioimaging, Sensing and Metabolomics.

C.3. Contracts

- Department of Analytical Chemistry, University of the Basque Country (UPV/EHU), Basque Country, Spain. Postdoctoral Researcher from February 2019 to to present.
- University of the Basque Country (UPV/EHU), Avda. Manuel de Lardizabal, 3, 20018 Donostia-San Sebastián. University teacher (replacement) at the Applied Chemistry Department from October 2018 to February 2019.
- Department of Analytical Chemistry, University of the Basque Country (UPV/EHU), Basque Country, Spain. Postdoctoral Researcher from September 2016 to September 2018.
- Department of Analytical Chemistry, University of the Basque Country (UPV/EHU), Basque Country, Spain. Predoctoral Researcher from January 2012 to December 2015.
- Department of Analytical Chemistry, University of the Basque Country (UPV/EHU), Basque Country, Spain. Researcher from October 2010 to December 2011.

C.4 Stays in international institutions

- Strathclyde Universtity, Centre for Nanometrology (Glasgow, Scotland). Predoctoral stay, March– June 2014.
- University of Copenhagen (Denmark). Predoctoral stay, from 5th to 20th of May (2012).

C.5. Additional training

- Animal Experimentation Training (B and C) UPV/EHU (2018)
- Challenges of chemical speciation: new analyzes, new methodologies, Analytical Speciation Group, Galicia (6h, 2015)

- Course for high-resolution NMR applications, Advanced Research Facilities (SGIker) UPV/EHU (20h, 2014)
- Fundamentals and applications of RAMAN spectroscopy, Advanced Research Facilities (SGIker) UPV/EHU (20h, 2012)
- Introduction to Matlab, University of Copenhagen, 3 ECTS (2012)
- Hyperspectral Image Analysis Course, Advanced Research Facilities (SGIker) UPV/EHU (40 h, 2012)
- Digital Image Course in Microscopy course, Advanced Research Facilities (SGIker) UPV/EHU (20h, 2011)
- Management of toxic, hazardous and sanitary waste course, Faculty of Science and Technology, UPV/EHU (4h, 2010)
- Lab safety course, Faculty of Science and Technology, UPV/EHU (4h, 2010)
- Biological Risk course, Faculty of Science and Technology, UPV/EHU (4h, 2010)
- Scanning Electron Microscopy (SEM) and Microanalysis, Advanced Research Facilities (SGIker) UPV/EHU (30h, 2010)
- Basic curse of gvSIG" BIONATUR, Faculty of Science and Technology, UPV/EHU (15h, 2010)

C.6. Conference and communications

- M. Irazola, B. Herrero de la Parte, I. Alvarez-Mora, O. K. Arriortua, E. Garaio, I. Rodrigo Arrizabalaga, J. Pérez-Muñoz, T. Chaoui-El-Kaid, C. Mar Medina, J.J. Echevarría-Uraga, J. M. Aizpurua, B. Ochoa, M. Olivares, K. Castro, N. Etxebarria. Assessment of a magnetic hyperthermia therapy for colorectal liver metastasis. 2nd Annual Canadian Metabolomics Conference Talks in Cannmore, Alberta, Canada (2019).
- I. Costantini, M.Veneranda, M. Irazola, J. Aramendia, K. Castro, J. M. Madariaga. In-situ and laboratory spectroscopic study of the mural painting of Ribera de Valderejo (Álava, Basque Country), Technart, Bilbao, Spain (2017).
- B.- Herrero, M. Irazola , I. García-Alonso, N. Etxebarría, E. Garaio, I. Rodrigo, T. Chaoui, F. Aguayo J. Saiz-López, J. Francisco, J. Echevarría-Uraga. Modificaciones enzimáticas y metabolómicas inducidas por la exposición del parénquima hepático a hipertermia magnética. Sociedad Española de Investigaciones Quirúrgicas, Cáceres, Spain (2016).
- B. Herrero, I. García-Alonso, M. Irazola, N. Etxebarria, E. Garaio, I. Rodrigo, T. Chaoui, F.J. Aguayo, A. Saiz, J.J. Echevarría. Effect of nanoparticles-induced hyperthermia over enzymatic serum activity and metabolites in liver parenchyma, 22nd Congress of the Spanish Society for Surgical Research, Caceres, Spain (2016).
- B. Herrero, I. García-Alonso, M. Irazola, N. Etxebarria, E. Garaio, I. Rodrigo, T. Chaoui-El-Kaid, F. Javier Aguayo, A. Saiz-López, J. Javier Echevarría-Uraga. Effect of nanoparticles-induced hyperthermia for colorectal liver metastases on the healthy liver tissue. The 51st Congress of the European Society for Surgical Research, Prague, Czech Republic (2016).
- M. Irazola, L. Garmendia, B. Zaldibar, U. Izagirre, E. Bilbao, S. Danielsson, A. Bignert, K. Castro, N. Etxebarria, M. Soto, I. Marigomez. Combination of microscopic and spectroscopic techniques to study the presence and the effects of microplastics in mussels. Mol2Net SciForum, online (2015).
- M. Irazola, O. Posada, H. Ziarrusta, J. Macho, U. Izagirre, L. Garmendia, M. Olivares, K. Castro, N. Etxebarria. Multidisciplinary approach to monitor and assess the effects on mussels exposed to hydrophobic organic micro- contaminants. XX Reunión de la Sociedad Española de Química Analítica, Galicia (Spain) (2015).
- E. Bizkarguenaga, M.R. Fernández, I. Zabaleta, M. Irazola, L.A. Fernández, A. Prieto, O. Zuloaga. Uptake of tonalide, galaxolide and bisphenol-A by carrot and comparison with concentration determined by means of polymeric materials. XX Reunión de la Sociedad Española de Química Analítica, Galicia (Spain) (2015).
- L. Garmendia, B. Zaldibar, U. Izagirre, E. Bilbao, M. Irazola, S. Danielsson, A. Bignert, N. Etxebarria, M. Soto, I. Marigómez . A comparison of optical methods to determine polystyrene microplastics in mussel tissues, suitable for retrospective studies base don ESBs' specimens, Environmental specimen bank international conference, France (2015).
- L. Garmendia, B. Zaldibar, U. Izagirre, E. Bilbao, M. Irazola, S. Danielsson, A. Bignert, N. Etxebarria, M. Soto, I. Marigómez. Polystyrene microplastic localization and distribution in the gills and digestive gland of mussel Mytilus galloprovincialis, CICTA, Spain (2015).
- J. Omar, M. Irazola, M. Olivares, A. Sarmiento, N. Etxebarria. Quantitative analysis of volatile compounds and qualitative analysis of hystological samples by means of Raman Spectroscopy and Chemometrics. BIT's 2nd Annual Congerence and EXPO of Analytix-2013, China (2013).
- M. Irazola, K. Castro, M. Olivares, J. Omar, A. Sarmiento, B- Herrero de la Parte, J.J. Echevarria-Uraga, B. Zaldibar, N. Etxebarria. Preliminary assays of hyperspectral image analysis on neoplastic rat liver. International Workshop on Multivariate Image Analysis, Spain (2013).
- M. Venerada, M. Irazola, M. Díez, A. Iturregui, J. Aramendia, K. Castro, J.M. Madariaga. Characterization of Middle Age mural paintings: in-situ Raman spectroscopy supported by different techniques. Workshop on Multivariate Image Analysis. RAA, Slovenia (2013).
- M. Irazola, M. Olivares, K. Castro, I. Martinez-Arkarazo, M. Maguregui, J. Pérez- Arantegi, M. Vendrell, F. Daniel and J.M. Madariaga. Use of the mobile spectrometry for the study of 16th century wall painting in the Basque Country (Spain). Technart, Germany (2011).

- S. Fdez-Ortiz de Vallejuelo, M. Irazola, K. Castro, M. Maguregui, I. Martinez- Arkarazo, M.D. Rodriguez-Laso and J.M. Madariaga. Non-destructive analysis by Raman Spectroscopy assisted by XRF and DRIFT of wallpapers from the 19th century. Technart, Germany (2011).
- M. Irazola, M. Olivares, K. Castro, M. Maguregui, I. Martinez-Arkarazo, J.M. Madariaga. Raman analysis of 16th Century Wall paintings in the Basque Country (Spain) assisted with DRIFTS and XRF. RAA, Italy (2011).

C.7. Service and professional activities

- Member of the divulgation committee of the Plentzia Marine Station (PiE-UPV/EHU)
- Organization and chairwoman of the Technart 2017 international conference in Bilbao.
- Master thesis tribunal (2016, 2017)
- Representative position of the third cycle students 2012 to 2016.
- Student in collaboration at the Analytical Chemistry Department, University of the Basque Country (UPV/EHU) from September 2009 to September 2010.

C.8. Scientific divulgation

- Participation in the XIV Scientific, Technology and Innovation week, Bilbao, Basque Country (2014).
- Participation in the XII Scientific, Technology and Innovation week, Bilbao, Basque Country (2012).
- Participation in the XI Scientific, Technology and Innovation week, Bilbao, Basque Country (2011).

C.9. Teaching experience

- Analytical Chemistry I (0.8 credits), Analytical Chemistry Department, University of the Basque Country (2015-2016).
- Experimental methodologies in chemistry (2 credits), Analytical Chemistry Department, University of the Basque Country (2015-2016).
- Forensic and educational analytical chemistry (1 credits), Analytical Chemistry Department, University of the Basque Country (2015-2016).

C.10. Other merits

- Certificate in Advanced English (Cambridge CAE, C1)
- Euskal Gaitasun Agiria (EGA, C1)
- Digital competences:
  - Windows, Linux and Mac Os user
  - Microsoft Office user, and advance user in Excel, Word and Power Point ∗ Latex user (Texmaker)
  - User of different reference managers (Refworks, Bibdesk, Jabref)
  - Adobe Photoshop and Premiere Pro user
  - Matlab user (data treatment and statistical analysis)
  - User of many different analytical instrumental software such as Xcalibur, Compound Discoverer and Mass Frontier (Thermo Fisher Scientific), Chemstation (Agilent Technologies), Wire (Renishaw), Spectra Manager (Jasco), Inca (Oxford Instruments) and so on