MINISTERIO DE CIENCIA E INNOVACIÓN

CURRICULUM VITAE (maximum 4 pages)

AGENCIA ESTATAL DE INVESTIGACIÓN

CV date	06/06/2023

Part A. PERSONAL INFORMATION

First name	LOURDES	
Family name	ARCE JIMENEZ	
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	SCOPUS Author ID (*)	7003549703
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A.1. Current position

Name of University/Institution	University of Córdoba		
Department	Analytical Chemistry		
Address and Country	Marie Curie Annex Building C3. Campus de Rabanales. Córdoba (Spain)		
Phone number	+34957218562		
Current position	-Full Professor -Vice-Chancellor of Innovation and Transfer of University of Córdoba	From	-03/10/2017 -09/07/2022
Key words	Ion mobility spectrometry, Gas chromatography, Capillary electrophoresis, Volatilome, Food fraud detection methods		

A.2. Previous professional situation

Period	Current Position / Institution / Country
2007-2017	Associate Professor/ University of Córdoba/ Spain
2005-2007	Ramón y Cajal Researcher University of Córdoba/ Spain
2001-2005	Lecturer/ University Pablo de Olavide, Sevilla/ Spain
2000-2001	Researcher hired by a national Project University of Córdoba/ Spain
1997-2000	Researcher hired by European Project University of Córdoba/ Spain
1995-1997	Lecturer (part time)/ University of Córdoba/ Spain

A.2. Education

PhD, Licensed, Graduate	University	Year
Doctor in Sciences (Chemistry)	Córdoba	1999
Licensed in Chemistry	Córdoba	1994

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

My scientific contributions can be divided in three differentiate parts according to my Ph.D. period (1), post doct position (2) and when I have been the leader of different projects (3).

(1): My research work started in 1994 and it focused on the development of analytical methods integrating sample treatment systems (solid phase extraction and/or supercritical fluids) fundamentally with Capillary Electrophoresis (CE) to solve environmental and agri-food problems, a line that I have followed together with my first doctoral students. During that period, I participated in 3 national and 3 European research projects, 2 transfer projects and 1 innovative public purchase project. This period was recognized with a PhD extraordinary award by University of Córdoba (UCO).

CE was a technique very well known in clinical and pharmaceutical analysis. Thanks to the work done during that period, we demonstrated the potential of CE to resolve agrifood analytical problems. We were the first analytical group in Spain demonstrating the potential of CE in this field and we can highlight the analytical methods developed to separate polyphenols

in tea or wine samples using CE, thanks to these research articles we stablished several international collaborations. During my stay at the University of Stockholm (Sweden) to get the mention of European PhD, I worked with a home-made CE system learning more about this technology. The scientific and technical capabilities acquired in that period allowed me to continue my research work as a post doc.
(2): I studied the Ion Mobility Spectrometry (IMS) potential as a novel technique in analytical laboratories to solve agri-food problems, being a worldwide pioneer in demonstrating the potential of this technique for food authentication. The research results obtained with this technique are being transferred to the productive sector.
(3): The relevance of my contributions studying the potential of IMS to the generation of theoretical knowledge in this technique and also in demonstrating how it can be a very useful detector for Gas Chromatography in non-target chemometric analysis is worldwide recognized, as it can be seen in the number of publications and citations of them.
My leadership capacity is endorsed as a principal investigator of 1 national project and 3 from Andalucía government. Since 2013, I have led 19 transfer projects with small and medium enterprises with a budget of € 449,974. In projects with the Spanish Olive Oil Interprofessional Organization, an useful methodology to classify virgin olive oils was developed using IMS. I have been responsible for line 7 of the INNOLIVAR project (€ 841,566) and responsible of an autonomic project in collaboration with the company SOVENA (€141,764). In summary, it can be said that the results of my research have been published in more than 100 scientific articles in indexed journals, book chapters and articles in informative journals. Having a normalized impact of 2.23. It has been calculated according to the methodology applied for the 2020 call for aid to «Severo Ochoa Centers of Excellence» and «María de Maeztu Units of Excellence» and citations of articles by the researcher as of 01/14/2022. I have directed 10 PhD and several research projects (final Master and Degree projects) and now I am co-directing 2 PhD students. Currently, the main objective of our investigation is focused on: A) Development of new instruments and analytical methods based on the use of IMS to avoid fraud in food labeling (mainly olive oil and Iberian ham), B) Search for chemical markers from volatilome for the rapid diagnosis of diseases in animals allowing better management of animal production or in plants. All this research experience allows me to be visiting professor at the University of Vienna (Austria), at the University of Concepción (Chile) and at several universities in the United Kingdom (Newcastle, Lincoln and Loughborough). My last 6-months stay was in 2015 with a grant from "Salvador de Madariaga" program at the University of Loughborough (UK). I belong to the members of the board of the International Society for Ion Mobility Spectrometry and she is the Sponsorship Coordinator of this society since 2015. In that year, I was the president of an international congress (24th Annual Conference on IMS) celebrated in Córdoba. I am an active collaboration with national and international groups or companies specialized in the use of IMS technology (e.g. in the group of Prof. Eiceman (USA), Prof. Thomas (UK) or Prof. Weller or Sielemann (Germany) and with companies such as G.A.S. (Dortmund, Germany), Ingeniería Analítica (Barcelona, Spain) and EXCELLIMS (Boston, USA).

Part C. RELEVANT MERITS

C.1. Publications (last 10 years).

1) Rodríguez-Hernández, P.; Martín-Gómez, A.; Cardador, M.J.; Amaro, M.A.; **Arce**, **L.,** Rodríguez-Estévez V. **2023**. Geographical origin, curing plant and commercial category discrimination of cured Iberian hams through volatilome analysis at industry level. **Meat Science.** DOI: https://doi.org/10.1016/j.meatsci.2022.108989.
2) Segura-Borrego, M.P.; Martín-Gómez, A.; Ríos-Reina, R.; Cardador, M.J.; Morales, M.L.; **Arce, L.**; Callejón, R.M. **2022**. A non-destructive sampling method for food authentication using gas chromatography coupled to mass spectrometry or ion mobility spectrometry. **Food Chemistry.** DOI: https://doi.org/10.1016/j.foodchem.2021.131540.
3) Martín-Gómez, A.; Pilar Segura-Borrego, M; Ríos-Reina, R; Cardador M.J.; Callejón R.M.; Morales M.L.; Rodríguez-Estévez V.; **Arce, L. 2022**. Discrimination of defective dry-cured Iberian ham determining volatile compounds by non-destructive sampling and gas chromatography. **LWT-Food Science and Technology** DOI: oi.org/10.1016/j.lwt.2021.112785.

4) Jurado-Campos N., Martín-Gómez A., Saavedra D., **Arce L. 2021**. Usage considerations for headspace-gas chromatography-ion mobility spectrometry as a suitable technique for qualitative analysis in a routine lab. **J. of Chromatogr. A** 1640, 461937.
5) Cardador M.J., Reyes-Palomo C., Díaz-Gaona C., **Arce L.,** Rodríguez-Estévez V. **2020.** Review of the methodologies for measurement of greenhouse gas emissions in livestock farm: pig farms as a case of study. **Critical Reviews in Analytical Chemistry** DOI: 10.1080/10408347.2020.1855410.
6) Martín-Gómez A., Arroyo-Manzanares N., Rodríguez-Estévez V**., Arce L. 2019.** Use of a non-destructive sampling method for characterization of Iberian cured ham breed and feeding regime using GC-IMS. **Meat Science** 152, 146-154.
7) Contreras, M.M.; Arroyo-Manzanares, N.; Arce, C.; **Arce, L. 2019**. HS-GC-IMS and chemometric data treatment for food authenticity assessment: olive oil mapping and classification through two different devices as an example. **Food Control** 98: 82-93.
8) Gerhardt, N.; Schwolow, S.; Rohn, S.; Ruiz Pérez-Cacho, P.; Galán-Soldevilla, H.; **Arce, L.**; Weller, P. **2019**. Quality assessment of olive oils based on temperature-ramped HS-GC-IMS and sensory evaluation: Comparison of different processing approaches by LDA, kNN, and SVM. **Food Chemistry**. 278: 720-728**.**
9) Jurado-Campos, N.; Garrido-Delgado, R.; Martínez-Haya, B.; Eiceman, G.A., **Arce, L. 2018**. Stability of proton-bound clusters of alkyl alcohols, aldehydes and ketones in Ion Mobility Spectrometry. **Talanta**. 185: 299–308.
10) Arroyo-Manzanares, N.; Martín-Gómez, A.; Jurado-Campos, N.; Garrido-Delgado, R.; Arce, C.; **Arce, L. 2018**. Target vs spectral fingerprint data analysis of Iberian ham samples for avoiding labelling fraud using headspace - gas chromatography - ion mobility spectrometry. **Food Chemistry**. 246: 65-73.
11) Garrido-Delgado, R.; Muñoz-Pérez, M.E.; **Arce, L. 2018**. Detection of adulteration in extra virgin olive oils by using UV-IMS and chemometric analysis. **Food Control**. 85: 292-299.

C.2. Research projects (last 10 years).

1) Decoding the molecular dialogue between fungal pathogens and rhizosphere microorganisms for enhanced biocontrol (RHIZOTALK). FINANCING ENTITY: European Union. Project Code: TED2021-130262B-I00. **DATE: 2022-2024**. **PI: M.C. Ruiz Roldán, A. Di Pietro**. **BUDGET: € 316.250,00.** Participation of **L. Arce** as researcher.

2) Design of an analytical platform that integrates complementary techniques to characterize organic and conventional virgin olive oils multiparametrically. FINANCING ENTITY: Counseling of knowledge, research and university (Andalucía Government): CALL PAIDI 2020. Project Code: P18-TP-2850. **DATE: 2020-2023**. **PI: L. Arce** and **R. Callejón**. **BUDGET: € 141.764,69**

3) Fine-tuning of analytical methodologies to evaluate the quality of acorn-fed Iberian ham, including a sampling technique that respects the integrity of the pieces. FINANCING ENTITY: UCO-FEDER: R+D+i projects within the framework of the FEDER Andalusia Operational Program 2014-2020. Call 2018. Counseling of Economy, Knowledge, Business and University. Project Code: 1261925-R. **DATE: 2020-2021**. **PI: L. Arce** and **V. Rodríguez Estévez**. **BUDGET: € 35,000**

4) Authentication of the feeding regimen supplied to the Iberian pig using non-invasive sampling and gas chromatography coupled with ion mobility spectrometry. FINANCING ENTITY: Counseling of Economy, Knowledge, Business and University 2017 call for grants for knowledge transfer activities between the agents of the Andalusian knowledge system and the productive fabric. Project Code: 1155447. **DATE: 2019-2021 PI: L. Arce**. **BUDGET: € 66.290**

5) Adaptation to climate change of extensive livestock models in Europe. FINANCING ENTITY: European Union. Project Code: LIFE17 CCA / ES / 000035. PI: V. Rodríguez Estévez
DATE: 2018-2022. L. Arce as researcher. BUDGET: € 2,207,025 (€ 366,466 to the UCO)

6) Developments of innovations in mechanization and technologies applied to the olive grove, olive oil and table olive sectors. Public precommercial purchase project "Innolivar" (Line 7. Application of analytical instruments based in Ion Mobility Spectrometry technology). DATE: **2017-2021.** PI: J.A. Gil Ribes Budget: € 13.098.734, **PI of Line 7: L. Arce. BUDGET: € 841,566**

7) Nanotechnological and miniaturized approximations for quality (bio)chemical data generation (CTQ2014-52939R). PI: M.S. Cárdenas, R. Lucena-Rodríguez, DATE: 2015-2018. VALUE: € 336,380. Participation of. **L. Arce** as researcher.

8) Innovative biological products for soil pest control (FP7-282767). VII EU framework. PI: Quesada-Moraga, E. DATE: 2012-2015. Budget: € 248,137. Participation of **L. Arce** as researcher.
9) Nanotechnological and miniaturized approximations to vanguard-rear-guard analytical systems (CTQ2011-23790). PI: M. Valcárcel, Budget: 2012-2015. Budget: € 465,850. Participation of **L. Arce** as researcher.

C.3. Contracts, technological or transfer merits (in all of them PI is L. Arce)

1) Viability study of an analytical method to detect hams with defects. FUNDING ENTITY: Interprofessional Association of Iberian Pigs (ASICI). DATE: 2022-2023. **Budget: € 45,980**

2) SENSOLIVE-OIL: Complete instrumental analysis to the panel test. FUNDING ENTITY: Interprofessional organization of spanish olive oil instrumental analysis complementary to the test panel. DATE: 2017 and 2020. **Budget: €10,890 + €17,937**

3) Study of new materials for sustainable construction with the environment. FUNDING ENTITY: ADICE. DATE: 2019-2020. **Budget: €30,000**

4) Identification of an instrumental technology which complements the communitary analytical method named "Panel-test" in virgin olive oils. Phase IV. FUNDING ENTITY: ceiA3-Interprofessional Organization of Spanish Olive Oil. DATE: 2017-2018. **Budget: € 48,400.**

5) Identification of an instrumental technology which complements the communitary analytical method named "Panel-test" in virgin olive oils. Phase III. FUNDING ENTITY: Interprofesional del Aceite de Oliva Español. DATE: 2016-2017. **Budget**: **€ 38,453.**

6) Determination of volatile compounds from hemp plants using Ion Mobility Spectrometry techniques. FUNDING ENTITY: Phytoplant Research, S.L. DATE: 2016-2017. **Budget**: **€ 12,100.**

7) Gas chromatography-Ion mobility spectrometry, an analytical technique to classify olive oils and identify chemical compounds which supports data provided by panel-test. FUNDING ENTITY: SOVENA, S.A. DATE: 2016-2017. **Budget**: **€ 21,780.**

8) Identification of an instrumental technology which complements the communitarian analytical method named "Panel-test" in virgin olive oils. FUNDING ENTITY: Interprofesional del Aceite de Oliva Español. DATE: 2014-2017. **Budget**: **71,176 €.**

9) Differentiation of virgin olive oils using Ion Mobility Spectrometry. FUNDING ENTITY: SOVENA, S.A. DATE: 2014. **Budget: € 32,978.**

C.4 Doctoral thesis supervised (last 10 years)

1) Evaluation of the potential of capillary electrophoresis for its implementation in agri-food laboratories. **M.Y Piñero Gonzalez**. SUPERVISORS: L. Arce, R. Bauza, M. Valcárcel. DATE: **2013**. CALIFICATION: Excellent (with honours). Number of publications: 5

2) Capillary Electrophoresis as a tool in the development of analytical processes for the extraction of (bio) chemical information in the agri-food field. **A. Carpio,** FUNDING: FPI grant from Spanish Government SUPERVISORS: L. Arce, M. Valcárcel. DATE: **2016.** Excellent (with honours). Number of publications: 6

3) New contributions of ion mobility techniques to environmental and clinical analysis. **L. Criado-García**, FUNDING: FPU grant from Spanish Government, SUPERVISORS: L. Arce, M. Valcárcel, DATE: **2016**, CALIFICATION: Excellent (with honours) with International Mention and Extraordinary doctorate award. Number of publications 8.

5) Determination of volatile compounds in goat cheeses at different stages of maturation using Ion Mobility Spectrometry (IMS) and their relationship with some microorganisms involved in their elaboration. **J. Gallegos**, FUNDING: National Secretariat of Higher Education Science, Technology and Innovation of Ecuador. SUPERVISORS: Lourdes Arce, Luis Medina, DATE: **2017,** CALIFICATION: Excellent (with honours). Number of publications: 3

6) Theoretical and applied study of the potential of ion mobility spectrometry". **N. Jurado-Campos**, FUNDING: FPU grant from Spanish Government, SUPERVISORS: N. Arroyo, L. Arce, DATE: September **2020**, CALIFICATION: Excellent (with honours) with International Mention. Number of publications 9.

7) Evaluation of the quality and curing process of Iberian ham by GC-IMS using a non-destructive sampling system. **A. Martín-Gómez**, FUNDING: Industrial PhD with COVAP, SUPERVISORS: Lourdes Arce, Vicente Rodríguez Estévez, DATE: March **2023**, CALIFICATION: Excellent (with honours). Number of publications 6.