



CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION		CV date	6 /06 /2024
First name	Raquel		
Family name	Ibáñez		
Gender (*)	Woman	Birth date	10/07/1965
e-mail	ibanezr@unican.es	URL Web	
Open Research and Contributor ID (ORCID)(*)	Orcid.org/0000-0002-0432-1827		

A.1. Current position

Position	Full Professor		
Initial date	18/12/2017		
Institution	Universidad de Cantabria		
Department/Center	Departamento de Ingenierías Química y Biomolecular/ETSIIyT		
Country	Spain	Teleph. number	942201594
Key words	Membranes, EDBM, Sustainable Engineering; Water		

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

Period	Position/Institution/Country/Interruption cause
03-07-2000 a 17-12-2017	Assistant professor/ Spain/
01-10-1998 a 02-07-2000	Profesora titular de escuela universitaria interina/Spain/----

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
1992	Universidad del País Vasco/Spain	Licenciada
1996	Universidad de Cantabria/Spain	PhD

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

Indicators of Quality and Scientific Production:

- 4 Teaching Steps (Quinquenios) & 5 sexenios (4 research steps and 1 transfer step)
- **PhD Thesis directed: 12** (three more ongoing)
- **H-index: 34** with 4421 citations (Scopus June 2024)
- Scientific production: 105 contributions in JCR Journals (70% in Q1); 5 patents, more than 160 contributions to specialised congresses.
- R&D Expertise: **IP in 17 national and regional projects and 12 R&D contracts** (participation as researcher in more 30 projects, included 6 internationals, and 28 research contracts).

Raquel Ibáñez is Full professor in chemical engineering at the University of Cantabria since 2017. Previously she had been assistant professor (2000-2017). As part of her commitment with university management she has been Head of the Chemical Engineering and Inorganic Chemistry Department (2004-2008) and Vice-Dean of the ETSIIyT (2008-on going). Her research activity covers different positions (pre and postdoctoral) along them she has the opportunity to develop several research lines, being most of them oriented towards R&D of new processes aimed at the treatment and **valorisation of waste and waste streams**. During her predoctoral period her research was focused in the characterization and treatment of industrial solid wastes. She obtained a predoctoral grant from the

enterprise TRADEBE, and she completed a predoctoral stay at the *Universidad Pedagógica y Tecnológica de Tunja* (Colombia) supported by a grant from the Spanish International Affairs Ministry. Besides an intensive technological transfer activity towards different enterprises, she published two books (edited by the Basque Government) and a number of publications in JCR (e.g. JHM; J Environ Eng ; Environ. Technol.). As associate professor in the UC, teaching and postdoctoral research activities were conducted in the Advanced Separation Processes (ASP) research group, headed by prof. Inmaculada Ortiz. In this period a research stay was completed at the Membrane Technology Group (Twente University, The Netherlands) supported by a grant from the program “*Programa de estancias para profesores de universidad y de escuelas universitarias en centros extranjeros y españoles*”. After her stay she started a new research line focused in electro-membrane processes. Since 2013 she has been heading the research group Sustainable Processes Engineering (IPS) of the University of Cantabria. Her research interest has been focused in the developments and **application of, advanced membrane processes for the material and energy valorization of waste streams**. Working in these R&D topics, she has been IP in 16 competitive projects (national and regional) and has participated in more than 33 as researcher (5 international). The internationalization of her research activities has increased in the last years, as researcher in projects obtained in SUDOE, LIFE or INDIGO calls. She has published more than 80 articles (JCR) most of them in Q1 journals, (h=27 Scopus December 2021) and more than 150 contributions to specialized congresses. She has obtained 4 research and 1 transference Steps (sexenios). She signed 11 research contracts and has participated as researcher in 25; has coauthored 4 Patents and a Utility Model.

Her contribution to decarbonization and climate change mitigation has been focused in the use of electromembrane technologies (EDR) for energy harvesting from salinity gradient between salty effluents (e.g. SWRO concentrate brines or UWWTP effluents) and the corresponding receiving waterbodies. Basic knowledge, related to fundamentals, viability conditions, modelling and optimization, has been carried out by means of EQC2018-004754-P, PDC2021-120786-I00) the performance of SGE-EDR in SWRO desalination plant attracted attention of ACCIONA AGUA and as result of a research contract a patent was coauthored (ES2814028-B2) and a proposal, LIFE INDESAL, has been submitted to current LIFE call. The performance of SGE-EDS as energy harvesting in coastal UWWTPs attracted attention of the Cantabria government (CG). A project financed by CG demonstrated the potential of such technology in a number of coastal UWWTP in Cantabria. As a result, a Pilot plant is being run in Comillas WWTP under Project LIFE 3E coordinated by MARE (CG).

Her commitment with the education of young researchers has 10 Doctoral Thesis, currently in the framework of the Doctorate in chemical engineering, energy and processes of the University of Cantabria. She has been responsible of Postdoctoral researchers in the framework of different competitive calls like Margarita Salas. In 2006 she was co-founded of a Technological Spin-off, APRIA SYSTEMS She is in charge of the “*servicios científico-técnicos*” of the Chemical and Biomolecular Department (UC) since 2011. In this role she has been in charge of the obtention of several quality standards (UN-EN-ISO9001:2015). She has been collaborator in the thematic area of Science and Chemical Technologies - subarea of Chemical Technology-, General Directorate of Research and Management of the National R&D Plan. (2012-2018). She is evaluator for different agencies, national (ANEP, DEVA, AEI) and international (EU, Akademy of Finland, CYTED; FCT).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (10 Recent publications (2020-2024) selected from 105 contributions in JCR)

1. Sampedro, T., Gómez-Coma, L., Ortiz, I., Ibañez, R. (2024) Unlocking energy potential: Decarbonizing water reclamation plants with salinity gradient energy recovery Science of the Total Environment, 906,167154. (Q1).
2. Fernández-Escalante, E., Ibañez, R., San-Román, M.-F. (2023). **Separation and Purification Technology**, 326,124645
3. Fernández-Escalante, E., Ibañez, R., San-Román, M.-F.(2023) Selective lithium separation from desalination concentrates via the synergy of extractant mixtures. **Desalination**. 556,116525 (Q1)

4. Sampedro T.; Tristán C.; Gómez-Coma L.; Rioyo J.; Sainz M.; Ortiz I.; Ibañez R. (2023) SWRO concentrates for more efficient wastewater reclamation. **Desalination** 545,116156. Q1
5. Santos, G., Ortiz-Gándara, I., Del Castillo, A., Arruti, A., Gómez, P., Ibáñez, R., Urriaga, A.; Ortiz, I. (2022) Intensified fish farming. Performance of electrochemical remediation of marine RAS waters. **Science of the Total Environment** 847,157368. Q1
6. Coterillo R. Gallart L.-E., Fernández-Escalante E., Junquera J. García-Fernández P., Ortiz I, Ibañez R. San-Román M.-F. (2022). Selective extraction of lithium from seawater desalination concentrates: Study of thermodynamic and equilibrium properties using Density Functional Theory (DFT). **Desalination**, 532, 115704.Q1
7. Gómez-Coma L.; Abarca J.A.; Fallanza M.; Ortiz A.; Ibáñez R.; Ortiz I. (2022) Optimum recovery of saline gradient power using reversal electrodialysis: Influence of the stack components. **Journal of Water Process Engineering** 48, 102816.Q1
8. Tristan, Fallanza, M., Ibáñez, R., Ortiz, I.(2020) Recovery of salinity gradient energy in desalination plants by reverse electrodialysis. **Desalination**, 496,114699. DOI 10.1016/j.desal.2020.114699. Q1.
9. C. Tristan, M. Rumayor, A. Dominguez-Ramos, M. Fallanza, R. Ibáñez, I. Ortiz (2020) Life cycle assessment of salinity gradient energy recovery by reverse electrodialysis in a seawater reverse osmosis desalination plant **Sustainable Energy & Fuels**, 4(8), pp. 4273-4284. DOI 10.1039/d0se00372g. Q1.
- 10.Ortiz-Martinez, V.M., Gómez-Coma, L., Tristan, C., Pérez G., Fallanza M., Ortiz A. Ibáñez R, Ortiz, I.(2020) A comprehensive study on the effects of operation variables on reverse electrodialysis performance. **Desalination** 482,114389. DOI 10.1016/j.desal.2020.114389. Q1.
- 11.Herrero-González, M., Diaz-Guridi, P., Domínguez-Ramos, A., Irabien, A., Ibáñez, R. (2020) Highly concentrated HCl and NaOH from brines using electrodialysis with bipolar membranes. **Separation and Purification Technology** 242, 116785. DOI10.1016/j.seppur.2020.116785. Q1

C.2. Congress

more than 20 contribution is last five years including national and international congresses related to chemical engineering, energy, sustainability and environment topics. The following are extracted:

- Book of abstracts 13th European Congress of Chemical Engineering. EFCE event Nº 767. 20-23 September 2021 (berlin, Germany on-line):
- C. Tristan, M. Fallanza, R. Ibáñez e I. Ortiz. on the energy recovery of waste streams: A process Synthesis tool for reverse electrodialysis power plant design.
- T. Sampedro, L. Gomez, M Fallanza, A. Ortiz, R. Ibáñez, I. Ortiz Blue Energy through reverse electrodialysis Technology: A promising renewable energy to implement in Europe.
- M. Herrero, A. Dominguez, R. Ibáñez, Towards Circular economy in desalination: Environmental sustainability of acid and base self-supply.

C.3. Research projects

Summary of the most relevant R&D projects in the last 5 years, from a total of 49 competitive projects and 36 contracts in which R. Ibáñez has participated throughout her R&D trajectory

a) Research projects obtained in competitive calls in which the author is acting as coordinator:

- PDC2021-120786-I00: Aprovechamiento energético del gradiente salino (EGS). Prueba de concepto para la innovación y transferencia de la Electrodialisis reversa (EDR) como tecnología sostenible . Founded: MCIN/AEI y UE Next Generation EU/PRTR). 01/12/2021 a 30/11/2023. IP: Raquel Ibáñez.
- PID2020-115409RB-I00: Tecnologías de recuperación de materias primas críticas de corrientes residuales en el marco de la economía circular. Founded: MCIN/ AEI). 01/09/2021 a 31/08/2024 IP: Raquel Ibáñez, ColP: Maria Fresnedo San Román.
- RTC-2017-6035-2: ImpulRAS: Hacia una mejora tecno-económica de ELOXIRAS®: control y minimización de subproductos. Founded: Ministerio de Economía y Competitividad. Retos Colaboración 2017. Participants: Apria Systems (coordinator) UC. 01/01/2018 a 31/12/2021. IP subproyecto UC: Raquel Ibáñez.

- CTM2017-87850-R: Tecnologías ambientales sostenibles para el aprovechamiento energético de corrientes residuales. Founded: Ministerio de Economía y Competitividad. 01/01/2018 a 31/12/2020. IP: Raquel Ibáñez.
EQC2018-004754-P: Laboratorio Integrado de Membranas y Sistemas de Reacción (MRSIL) founded: Ministerio de Ciencia, Innovación y Universidades. IP: Raquel Ibáñez
- b) Participation as researcher in competitive projects obtained in international calls:
- LIFE-3E: ENVIROMENT-ENERGY–ECONOMY (LIFE19ENV/ES000143) Founded: European Commission. 01/10/2020- 30/09/2024.Coordinator: MARE S.A.
- SUDOE ENERGY PUSH: SUDOE Efficient energy for public social housing (FEDER) SOE3/P3/E0865. Founded: European Commission. 01/09/2019- 31/08/2022. Coordinator: UC
- HYLANTIC: Atlantic network for renewable generation and supply of hydrogen to promote high-energy efficiency (FEDER). ATLANTIC AREA EAPA_204/2016. Founded: European commission. Coordinator: UC. 01/10/2017- 30/09/2020.
- LIFE-2-ACID. LIFE16 ENV/ES/000242. Founded: European Commission. 01/07/2017- 31/12/2020. Coordinator: APRIA SYSTEMS
- PEMFC-SUDOE: Sostenibilidad energética en la región SUDOE: Red PEMFCSUDOE (FEDER) PEMFC-SUDOE- SOE1/PI/E0293. COMISION EUROPEA. 01/07/2016- 30/06/2019.

C.4. Contracts, technological or transfer merits

A) R&D contracts:

- Desarrollo y seguimiento de aplicaciones de electrodiálisis. Founded: Solvay 13/09/2021 a 12/12/2021. IP: Raquel Ibáñez
ELOXIRAS© DULCE: Oxidación Electroquímica en sistemas de Acuicultura de Agua Dulce en Recirculación. Founded: APRIA Systems, SODERCAN. 05/03/2020- 31/12/2020.IP: R. Ibáñez.
- Ensayos relativos a la caracterización de polímeros y disoluciones acuosas u orgánicas. Founded: DYNASOL, S.A.; 02/01/2020- 01/01/2024. IP: R. Ibáñez.
- Evaluación técnica de la recuperación de la energía de gradiente salino contenida en la mezcla salmuera-agua de mar mediante electrodiálisis reversa. Founded: ACCIONA S.A. 01/05/2018- 01/02/2019. Researcher.
- Tratamiento Electroquímico de Aguas residuales Procedentes de EDAR. Founded: CADAGUA. S.A. 16/10/2018- 30/07/2019. Researcher.

B) Patents and Utility Models

- Ferrer O., Malfeito J.J., Ortiz I., Ibáñez R., Ortiz A. Procedimiento de recuperación de energía con mezcla de corrientes de osmosis inversa. Titular: ACCIONA AGUA S.A. ES2814028-B2. concesión 28/07/2021
- P. M. Gomez; R. Ibáñez, A. M. Urriaga & I. Ortiz, Modelo de utilidad U202131422(7) -Instalación de recirculación acuícola de agua dulce. Titular: APRIA SYSTEMS, S.L. Nº pub.: ES1275532 19/10/2021.
- Ortiz I, Urriaga A.M.; Ibáñez R., Pérez-González Antia Título: *Proceso de Conversión de Salmueras en ácidos y Bases y productos obtenidos*. Solicitud: P201200758. País de prioridad: España. Titular: UC.
- Valiño V, Valiente R., San Román M.F., Ibáñez R., Ortiz I Título: *Método espectroscópico para la determinación de proteínas en medios complejos*. N. de solicitud: ES2464440 A1 País de prioridad: España. Fecha de prioridad: (02.06.2014). Titular: UC.
- Ortiz I, Galán B., Ibáñez R. Título: *Método para la extracción y concentración simultaneas de compuestos de fases líquidas utilizando membranas microporosas* N. de solicitud: ES 2 187 311 B2. País de prioridad: España. Titular: UC

C)Other transfer merits

- Co-founder of Technological Spin-off APRIA SYSTEMS (<http://www.apriasystems.es/>)