

VÍCTOR ALCOLEA RODRÍGUEZ

Ph.D. in Medicinal Chemistry

Scientist – Researcher

Raman Spectroscopy Nanotoxicology Surface reactivity Nanomaterials**RESEARCH PROFILE**

- ORCID: <https://orcid.org/0000-0002-2392-0817>
- Spanish National Research Council – Institute of Catalysis and Petrochemistry: <https://icp.csic.es/es/perfil/alcolea-rodriguez-victor/>
- SCOPUS: <https://www.scopus.com/authid/detail.uri?authorId=57219417944>

CURRENT POSITION

Spanish National Research Council (CSIC)	SENIOR RESEARCHER / MARCH 2023 – FEBRUARY 2024 Institute of Catalysis and Petrochemistry (ICP) - CSIC Project: PlasticFate Research Area: Toxicity and reactive characterization of micro and nanomaterials (metal oxides, fibers, and plastics)
Complutense University of Madrid (UCM)	HONORARY COLLABORATOR / OCTOBER 2019 – PRESENT Assistance in teaching courses in the physical chemistry department of the pharmacy faculty. Subjects: Analytical Chemistry I and Analytical Chemistry II
Palma Municipal Training School (Municipal Fire Brigade)	SCIENCE TEACHER/ MARCH 2019 – PRESENT Professor in the area of chemical risk and experimental sciences.

RESEARCH EXPERIENCE AND STAYS

Université Paris Cité - Functional and Adaptive Biological Unit (BFA)	VISITING RESEARCHER / SEPTEMBER 2023 Two-week stay for the development of Raman microscopy applied to cell cultures contaminated by micro and nanoplastics. Evaluated cell line: Calu-3 Supervisor: Dr. Stéphanie Devineau Funding: CSIC i-link
German Federal Institute for Risk Assessment - Das Bundesinstitut für Risikobewertung (BfR)	RESEARCHER / OCTOBER 2022 – FEBRUARY 2023 Research about nanomaterial toxicity under the supervision of Prof. Dr. Andrea Haase and Dr. Verónica Dumit. Execution of molecular and cellular biology techniques: protein isolation (proteomics), ELISA, studies of cytotoxicity and autophagy in lung cell lines (A549 and dTHP-1)
Spanish National Research Council (CSIC)	PREDOCTORAL RESEARCHER/ OCTOBER 2019 – OCTOBER 2022 Institute of Catalysis and Petrochemistry (ICP) Project: "Reactive bases of nanoparticle toxicity" Supervisors: - Prof. Dr. Miguel Ángel Bañares. https://orcid.org/0000-0003-3875-4468 - Dr. Raquel Portela. https://orcid.org/0000-0002-1882-4759
German Federal Institute for Risk Assessment - Das Bundesinstitut für Risikobewertung (BfR)	VISITING RESEARCHER / APRIL 2022 – JULY 2022 Three-month stay to conduct cytotoxicity tests on reference nanomaterials in A549 and THP-1 differentiated macrophages cell lines. Supervisors: Prof. Dr. Andrea Haase and Dr. Verónica Dumit
University of Barcelona (UB)	PRACTICE RESEARCHER / FEBRUARY - JULY 2019 Faculty of Chemistry, Medical Chemistry area. Project: "New methods of bioconjugation: reactions of thiols with propargylated antitumoral drug models"
NuMat MedTech	SCHOLARSHIP RESEARCHER / MAY - JULY 2018 Project: "Modification and functionalization of titanium surfaces for use as implantable medical devices". Research group: Cell Therapy and Tissue Engineering (TERCIT). CRUE-CEPYME research grant from Banco Santander

Institute for Health Research of the Balearic Islands (IdISBa)

COLLABORATING STUDENT / MARCH 2017 – MAY 2018

Research group: Cell Therapy and Tissue Engineering (TERCIT). Project: "Improved biocompatibility of new implantable medical devices". 300 hours.

Supervisor: Dr. Marta Monjo

University of the Balearic Islands (UIB)

COLLABORATING STUDENT / SEPTEMBER 2016 – FEBRUARY 2017

Laboratory of Environmental Analytical Chemistry (QAA). Routine analysis of water, air, and soil. 180 hours.

Supervisor: Dr. Victor Cerdà and Dr. Edwin Palacios

ACADEMIC EDUCATION

Complutense University of Madrid (UCM)

PhD IN MEDICAL CHEMISTRY / SEPTEMBER 2019 – MARCH 2024

Faculty of Pharmacy, Department of Physical Chemistry
Awarded with High Distinction (Cum Laude)

University of Barcelona (UB)

MASTER IN BIOMEDICINE / SEPTEMBER 2018 – JULY 2019

Pathway: Translational research in human pathologies

National Distance Learning University (UNED)

MASTER IN CHEMICAL SCIENCE AND TECHNOLOGY / SEPT 2020 – SEPT 2023

Pathway: Analytical Chemistry

Master's Thesis: "Reactive bases of the toxicity of nanomaterials". Grade: 10 (with Honors)

Universidad de las Islas Baleares (UIB)

BACHELOR'S DEGREE IN CHEMISTRY / SEPTEMBER 2013 – JUNE 2018

Pathway: Biomedical and Health Chemistry (6.79/10)

COURSES AND SEMINARS – ADDITIONAL TRAINING

- **Nanosafety Training School (Online)**. From basic science to risk governance. 15 hours
- **Nanosafety Training School (Venice 2022)**. From basic science to risk governance. 15 hours
- **Nanosafety Training School (Venice 2023)**. From basic science to risk governance. 15 hours
- **Spanish National Research Council (CSIC)**. Course in material characterization and instrumental techniques. Module II. 31 hours
- **Spanish National Research Council (CSIC)**. Course in material characterization and instrumental techniques. Module III. 30 hours
- **Spanish National Research Council (CSIC)**. Advanced Applied Statistics. Design of experiments, modeling and multivariate analysis with IBM SPSS statistics. 20 hours
- **Spanish National Research Council Foundation**. Courses in Good Scientific Practices. 25 hours
- **University of the Balearic Islands (UIB)**. Basic Technician in Occupational Risk Prevention. 30 hours.,
- **Official School of Languages (Palma)**. English B1 Certificate
- **Scientific and Technological Centers of the University of Barcelona (CCiTUB)**. User course on experimental animals. 110 hours.
- **Son Espases University Hospital**. Specialist Technician in Medical Emergencies. 20 hours.
- **Spanish Basketball Federation**. Advanced Basketball Coaching Course. 750 hours.

PARTICIPATION IN EUROPEAN PROJECTS

- **BIORIMA (GA 760928)**. Risk management of biomaterials. <https://www.biorima.eu/> 2019, Spanish National Research Council (CSIC).
- **SUNSHINE (GA 952924)**. Development of safety assessment strategies for new advanced multicomponent nanomaterials for commercial use in the industry. <https://www.h2020sunshine.eu/> 2021-2022, Spanish National Research Council (CSIC).
- **NANOINFORMATIX (GA 814426)**. Development and implementation of a sustainable modeling platform for NanoInformatics (development of probe reactions for physicochemical characterization of nanoparticles, and toxicity assays). <https://www.nanoinformatix.eu/> 2019 – 2023, Spanish National Research Council (CSIC) and BfR (Berlin, Germany)
- **PlasticFate (GA 965367)**. Risk assessment of plastics on human health and synthesis of micro and nanoplastics that serve as reference materials. <https://www.plasticsfate.eu/> 2023, Spanish National Research Council (CSIC).
- **Harmless (GA 953183)**. Risk assessment of next-generation multicomponent nanomaterials relevant to human health and the environment. <https://www.harmless-project.eu/> 2022-2023, BfR (Berlin, Germany).
- **CHARISMA (GA 952921)**. Set to harmonise Raman Spectroscopy for characterisation across the life cycle of a material. <https://www.h2020charisma.eu/project-overview> 2021-2023, Spanish National Research Council (CSIC)

In preparation (8)

- **Alcolea-Rodríguez, V....** & Portela, R, Bañares, M. A. (2024). In chemico methodology to rank nanomaterials according to number, nature and oxidative capacity of surface sites. Status: *under review in **Environmental Science: nano***
- Stobernack, T., Dommershausen N., **Alcolea-Rodríguez, V.,...** & Dumit, V. Advancing Nanomaterial Toxicology Screening through Efficient and Cost-Effective Quantitative Proteomics. (2023). Status: *under review in **Nanomaterials***.
- **Alcolea-Rodríguez, V....** & Portela, R, Bañares, M. A. (2024). Reactive sites-based dose metrics for nanotoxicity: an in chemico approach to categorize the reactive surface oxidative potential of engineered nanomaterials. Status: *Under review by international collaborators*
- **Alcolea-Rodríguez, V....** & Portela, R, Bañares, M. A. (2024). Differentially induced autophagy by engineered nanomaterial treatment has an impact at cellular homeostasis and cytotoxicity. Status: *Under review by international collaborators*
- **Alcolea-Rodríguez, V....** & Portela, R, Bañares, M. A. (2024). Surface reactive and dissolution rates implications in hydroxyapatite and iron-based nanobiomaterials. Status: *Under review by international collaborators*
- Burgum, M., **Alcolea-Rodríguez, V....** & Portela, R, Bañares, M. A. (2024). The dispersion approach alters the surface of carbon nanotubes but it does not involve their *in vitro* mutagenicity to human cells. Status: *writing discussion and conclusions*
- **Alcolea-Rodríguez, V....** & Portela, R, Bañares, M. A. (2024). Raman monitoring of nanoPET depolymerization. Status: *writing results and discussion*
- Altmann, K., Portela, R., Waniek, T., Wachtendorf, V., **Alcolea-Rodríguez, V., ...** & Lea Ann Dailey. (2024). Current good practices for the production of test and reference materials for micro- and nanoplastic research. Status: *Under review by international collaborators*

Published (5)

- Robles-Martín, A., Amigot-Sánchez, R., Fernandez-Lopez, L., Gonzalez-Alfonso, J. L., Roda, S., **Alcolea-Rodríguez, V., ...** & Guallar, V. (2023). Sub-micro-and nano-sized polyethylene terephthalate deconstruction with engineered protein nanopores. **Nature Catalysis**, 1-12. DOI: <https://doi.org/10.1038/s41929-023-01048-6>
- Jiménez-Arroyo, C., Tamargo, A., Molinero, N., Reinoso, J. J., **Alcolea-Rodríguez, V.,** Portela, R., ... & Moreno-Arribas, M. V. (2023). Simulated gastrointestinal digestion of polylactic acid (PLA) biodegradable microplastics and their interaction with the gut microbiota. **Science of The Total Environment**, 166003. DOI: <https://doi.org/10.1016/j.scitotenv.2023.166003>
- Tamargo, A., Molinero, N., Reinoso, J. J., **Alcolea-Rodríguez, V.,** Portela, R., Bañares, M. A., ... & Moreno-Arribas, M. (2022). PET microplastics affect human gut microbiota communities during simulated gastrointestinal digestion, first evidence of plausible polymer biodegradation during human digestion. **Scientific Reports**, 12(1), 1-15. DOI: <https://doi.org/10.1038/s41598-021-04489-w>
- Serrano-Lotina, A., Portela, R., Baeza, P., **Alcolea-Rodríguez, V.,** Villarroel, M., & Ávila, P. (2022). Zeta potential as a tool for functional materials development. **Catalysis Today**. DOI: <https://doi.org/10.1016/j.cattod.2022.08.004>
- Llopis-Grimalt, M. A., Forteza-Genestra, M. A., **Alcolea-Rodríguez, V.,** Ramis, J. M., & Monjo, M. (2020). Nanostructured Titanium for Improved Endothelial Biocompatibility and Reduced Platelet Adhesion in Stent Applications. **Coatings**, 10(9), 907. DOI: <https://doi.org/10.3390/coatings10090907>

Appearance in Acknowledgments (1)

- Petit, E., Bosch, L., Costa, A. M., Rodríguez-Izquierdo, I., Sepúlveda-Crespo, D., Muñoz-Fernández, M. A., & Vilarrasa, J. (2021). BMS Derivatives C7-Linked to β -Cyclodextrin and Hyperbranched Polyglycerol Retain Activity against R5-HIV-1NLAD8 Isolates and Can Be Deemed Potential Microbicides. **ChemMedChem**, 16(14), 2217-2222. DOI: <https://doi.org/10.1002/cmdc.202100080>

PARTICIPATION IN CONFERENCES

- 2022. I Congreso de la Sociedad Iberoamericana de Microbiota, Probióticos y Prebióticos. Oral communication "Impacto de la ingesta de microplásticos en el tracto gastrointestinal y en la microbiota colónica humana"
- 2022. Annual meeting NanoInformaTiX. Oral communication "MODELS' VALIDATION AND INTEGRATION, FEEDING TO DATABASES. Surface reactivity descriptors"
- 2022. Nanoweb Cyprus 2022. Oral communication "New descriptor to quantify the number, nature and specific reactivity (Oxidative Turnover Frequency) of surface reactive sites for nanomaterials evaluation, grouping and dose metrics"
- 2022. Nanoweb Cyprus 2022. Poster The Cytotoxic and Genotoxic Effects of Carbon Nanotubes on Human Cells In Vitro"
- 2022. ICT2022. Poster "Investigating the cytotoxic and genotoxic potential of carbon nanotubes in human cells in vitro"
- 2023. EuropaCat23. Oral communication "Biological air quality: catalytic inactivation of airborne viruses"
- 2023. SECAT23. Oral communication "Correlación de la capacidad oxidativa con la capacidad biocida"
- 2023. NAM28. Oral communication "Efficient Technology for Catalytic Virus Inactivation"

TEACHING AND SUPERVISION

- Teaching staff at Pharmacy faculty, Complutense University of Madrid) – Subject: Analytical chemistry. 135 teaching hours
- Teaching staff at Mallorca Municipal Fire Brigade – Chemical risk and experimental science. 133 teaching hours
- Teaching staff at CSIC training office – Raman Spectroscopy. 8 hours teaching
- Co-supervision of Bachelor's Thesis. Student: Miguel Armas. Degree: Chemical Engineering (UAM)
- Co-supervision of Bachelor's Thesis. Student: Belen Leon. Degree: Chemistry (UAM)

SKILLS

- Communication: Radio contributor in the sports section – 5 years and 6 months (DEC 2016 – MAY 2022)
- Good verbal and written communication skills in English
- Experience working in interdisciplinary and international research team at CSIC and BfR