

LINE OF RESEARCH	KEYWORDS
<b>Chemistry and electrochemistry of inorganic materials</b>	<i>Hydrothermal, sol-gel, ceramic and mechanochemical synthesis procedures, intercalation compounds, use of reverse micelles</i>
<b>Chromatographic and non-chromatographic methods for selection and quantitation</b>	<i>Luminescence techniques, nanomaterials, liposomes, microfluidic systems, UPLC, immunoassays, (bio)sensors, kinetic methods</i>
<b>Chromatographic analysis of pollutants</b>	<i>Analysis of disinfection products by GC/MS, CE, LC. Miniaturized sample analysis, organic volatile compounds, swimming pool water</i>
<b>Supramolecular analytical chemistry</b>	<i>Nanostructured solvents, surfactants, intelligent self-assembled systems, food and environmental analysis</i>
<b>Organic catalysis and nanostructured materials</b>	<i>New materials for their application as adsorbents and catalyzers, layered compounds, clays, carbonaceous materials</i>
<b>Nanochemistry and waste and biomass valorization</b>	<i>Lignin depolymerization with heterogeneous catalysis, waste valorization, nanochemistry</i>
<b>Organic chemistry</b>	<i>Biorefinery and biofuels, sustainable organic chemistry, photocatalysis, green organic chemistry</i>
<b>Chemical engineering</b>	<i>Treatment and valorization of organic waste from agri-food industry, anaerobic digestion, composting processes, pulp and paper production, biorefineries, biorreactors in food industries</i>
<b>Differential equations, numerical simulation and software development</b>	<i>Development of numerical methods, applications</i>
<b>Electronegative plasma physics</b>	<i>Study of ion sheaths for electronegative and electropositive plasma sources</i>
<b>Applied Optics</b>	<i>Optical fibre based photonic technology, optical communications</i>
<b>Plasma physics</b>	<i>Plasma characterization, thermodynamic equilibrium, analysis of samples</i>
<b>Plasma Laboratory</b>	<i>Hydrogen production and food preservation, equilibrium and transport phenomena in plasma sources, plasma applications and diagnostics</i>
<b>Atomic and Nuclear Physics</b>	<i>Atomic and Nuclear Structure, spectroscopy, low temperature mesoscopic systems. Nuclear materials, Monte Carlo simulations, Many-body physics</i>

# LINES OF RESEARCH

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University of Cordoba  
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LINE OF RESEARCH	KEYWORDS
<b>Genetics and behavioral disorders</b>	<i>Autism genetics, Caenorhabditis elegans, molecular mechanism of the neuronal synapse</i>
<b>Plant physiology</b>	<i>Physiology and molecular biology of the N assimilation, metabolism of the N and C in plants in response to different factors</i>
<b>Molecular mechanisms of mutagenesis and DNA repair</b>	<i>Genome and epigenome stability, DNA methylation and demethylation, DNA repair</i>
<b>Molecular Genetics of fungal pathogenesis</b>	<i>Biogenesis of Wall and transcriptional regulation of lysis enzymes, the ubiquitin-ligase-Fbp1 complex, identification of target proteins</i>
<b>Molecular and cell endocrinology</b>	<i>Cell biology of endocrine cells, metabolic syndrome, obesity</i>
<b>Biomembranes, antioxidants and oxidative stress</b>	<i>Ageing and antioxidant compounds, eukaryotic cells, proteomics, apoptosis, cell membranes</i>
<b>Biotechnology of Higher Plants and Green Algae</b>	<i>Molecular factors of the metabolic differentiation of pulses, growth of photosynthetic organisms incorporating higher levels of tocopherols</i>
<b>Biological Physical Chemistry</b>	<i>Development of nanomaterials, nanoparticles and self-assembled molecular layers, electro chemical sensors, interaction with proteins, bionanoconjugates</i>
<b>Inorganic Chemistry</b>	<i>Rechargeable ion-lithium and lead-acid batteries, self-cleaning building material, nanomaterials</i>
<b>Molecular Electrochemistry</b>	<i>Antioxidant Conductive Polymers/ nanoparticles, pollutants and herbicides, physical chemistry of waters, sensors and biosensors</i>
<b>Physical Chemistry</b>	<i>Molecular assembly (LB Films), electroluminescent devices, gas sensors, 2D-phase transitions in electrochemistry</i>
<b>Chemistry of layered compounds</b>	<i>Hydroxides (hydrotalcite and layered double hydroxides and mixed acetates) as catalyzers, clays as pollutant adsorbents and carriers for pesticide delivery</i>
<b>Automation, simplification and quality of (bio)chemical measurement processes</b>	<i>Analytical nanotechnology and nanoscience, ion mobility, microextraction techniques using nanomaterials, liquid-liquid microextraction, infrared, GC/MS, LC/MS, hyphenated techniques</i>
<b>Analytical platforms in metabolomics/proteomics and valorization of agri-food waste</b>	<i>Metabolomics, lipidomics, green analytical Chemistry, valorization of agri-food by-products, automation, continuous systems, non-chromatographic separation techniques</i>

LINE OF RESEARCH	KEYWORDS
<b>Fruit processing</b>	<i>Vinification, red grapes, antioxidant activity, wine clarification, ageing of fino and oloroso wines</i>
<b>Oenology and viticulture</b>	<i>Yeast proteomics and metabolomics and immobilization, wine ageing, by-product valorization</i>
<b>Nitrogen metabolism of bacteria, microbial metabolism</b>	<i>Bacteria that degrade cyanide, purification of wastes from jewellery products</i>
<b>Assimilation of nutrients in "Prochlorococcus cyanobacteria" key in marine ecosystems</b>	<i>Use and transport of glucose by Prochlorococcus, control of N/C and N metabolism</i>
<b>Metabolism of inorganic nitrogen in algae</b>	<i>Chlamydomonas reinhardtii, nitrate/nitrite reduction, molybdenum metabolism photo production of stark and hydrogen</i>
<b>Molecular biomarkers of environmental pollution and physiological stress</b>	<i>Biochemical biomarkers, environmental proteomics, oxidative stress, newborn syndrome</i>
<b>Agri-food biotechnology</b>	<i>Genomics, biotechnology, bioinformatics, ageing molecular markers microarrays, gene expression, vitamin D</i>
<b>Molecular biology of the response to stress mechanisms</b>	<i>Genomics, transcriptomics, proteomics, gene expression, RT-PCR, oxidative stress biomarkers, environmental pollution</i>
<b>Molecular defense systems against the oxidative stress and proteomics</b>	<i>Antioxidant properties of grapevine products, identification of redox proteome und glutarredoxines in S. cerevisiae</i>
<b>Plant biotechnology and pharmacognosy</b>	<i>Biotechnology of strawberry ripening, molecular basis of the interactions pathogen-strawberry plant-pathogen</i>
<b>Ethology</b>	<i>Animal behavior</i>
<b>Systemic and applied botany</b>	<i>Aerobiology, phenology, mycology, pollen calendar, aerobiology network, pollen analysis of honey samples</i>
<b>APHANIUS. Research in fish</b>	<i>Conservation and management of freshwater fish fauna</i>
<b>Soil and terrestrial fauna</b>	<i>Invertebrates, soil nematology, termite biology and control, insect control</i>
<b>Terrestrial ecology</b>	<i>Plant ecophysiology, conservation, plant-animal interactions, insect and bird ecology, Mediterranean shrubs</i>