

Human Toxicology

For a better evaluation of natural, technological and industrial risks

Exploring the mechanisms of the response of living to abiotic stresses to

- Characterise the mechanisms for interpreting the toxic effects of pollutants or stresses
- Identify molecular and/or cellular biomarkers to quantify these effects and establish regulatory standards
- Propose predictive systems for the toxicity of a chemical compound or a potentially harmful agent/factor
- Develop and/or qualify protocols or formulations to prevent and/or limit risk
- Study the biotransformation of mineral nanomaterials in tissues

Toxic agents and stress of interest

Nanomaterials
Metals
Organic Toxics
Plastics
Radionuclides
Oxidative stress
UV, solar radiation and ionising radiation

By using tools for global or targeted analysis of the response

- Genomics, transcriptomics, proteomics, metabolomics
- Study of cell damage repair systems
- Innovative and relevant cell models and ethical to avoid humanised animal models
- Protein biochemistry, bioinorganic chemistry, bioinspiration
- Analytical chemistry: mass spectrometry, LC
- Large-scale facilities - Synchrotron

Applications

Dual research
Disaster management
Threat response
Exposure control
Protective measures

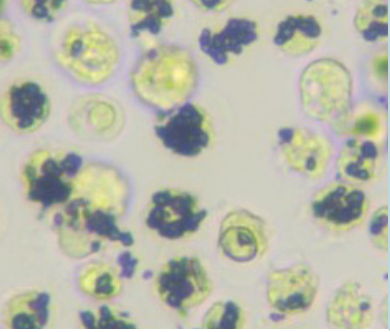
Industrial
Dermo-cosmetics,
Pharmacology - Diagnostics
Speciality chemicals
Optoelectronics

In figures

5 PhD students incl. CIFRE per year
21 researchers
25 publications per year
7 patents
7 EU projects
6 industrial partnerships

Networks & ecosystem





Mineral biocides

Cellulose nanocrystals functionalized with silver nanoparticles

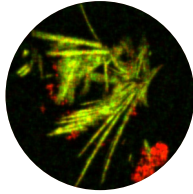
> Propose biocides with controlled activity, biodegradable and non-toxic

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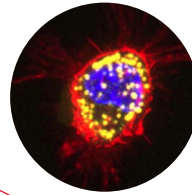
Nanomaterials

Bioaccumulation - Biotransformation
Persistence of biological effects
Inflammatory reaction - Macrophages
Radiosensitisation
Epigenetic changes



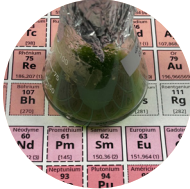
Micro and Nano Plastics

Co-exposure to pollutants and additives
Effects of ageing
Inflammation - Epithelial and immune barrier models

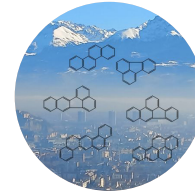


Heavy metals

Membrane transporters
Cellular homeostasis
Specific chelators



Abiotic stresses and pollutants

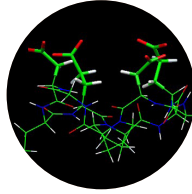


Organic toxins

PAHs - Pesticides
DNA alkylating compounds
Vesicants

Radionuclides, oxidative stress, radiobiology

Uranium - Ligands *in vivo*
Bioinspired supramolecular complexes
Decorporation agents



UV, solar radiation

UVA and UVB phototoxicity
Chemical photosensitization
Photoprotection



DNA photoproducts

Biomarkers of genotoxicity of UVA/UVB radiation

> To propose a reference method for risk assessment and qualification of photoprotective agents

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