

COST Action no. CM1201

Biomimetic Radical Chemistry

2012 | 2016

Objectives

- To implement biomimetic chemical models for the understanding of free radical biological events connected to cell metabolism and fate.
- To enhance the contribution of chemical and mechanistic knowledge in the study of biological and enzymatic processes mediated by free radicals and envisage new strategies for the control of free radical processes which can cause biological damages.
- To open new perspectives for free radical mediated methodologies by catalytic, selective and environmental-compatible processes for life and material sciences.
- To foster integration of different methodologies and scientific approaches embracing chemical, biophysical, biochemical, biological and medical aspects.

Main Achievements

- Mix of expertise in order to produce the best interaction possible for the main topics of the Action.
- Reach the optimal level of communication with a common language to be developed among different fields.
- Set-up of basic methodologies in different laboratories, with diffusion of protocols linking chemical and biological research.
- Create the interdisciplinary context needed to address the main topics in free radical research related to life sciences.
- Evidence the important role of scientific discoveries in health and biotechnology for society.

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Chemistry and Molecular Sciences and Technologies (CMST)

Participating countries

AT, BG, CH, CY, CZ, DE, DK, EL, ES, FR, HR, HU, IE, IL, IT, NL, PL, PT, RO, RS, SE, SI, TR, UK

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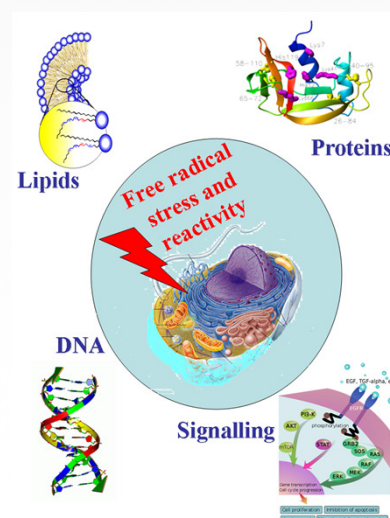
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Working Group activities

WG1 – Radical enzymes

- Models for functioning of enzymes through free radical pathways and intermediates.
- Reactivity studies of: nucleophilic ketyl radicals, H-abstraction by the 5'-deoxyadenosyl radical, reductase enzymes, B12-derived organometallic compounds, single-electron transfer of flavoenzymes.
- Environmentally useful radical enzyme reactivity, bacterial resistance through the cis-trans isomerase enzymes.

WG2 – Models of DNA damage and Consequences

- Generation and study of clustered oxidative damage in oligonucleotide sequences and models
- Development of nucleic acid modifications, including tandem damages with lipids and proteins, with a view to provide a complete screening of DNA damages.
- Repair/antioxidant mechanisms and biological effects also for preventive strategies against radical damage.

WG3 – Membrane stress, signalling and defences

- Development of liposomes as biomimetic models of damage and repair of lipid peroxidation and isomerization
- Lipid transformations and remodelling in the frame of cellular signalling and related metabolic processes.
- Biomarker development for nutr lipidomics.

WG4 – Bio-inspired synthetic strategies

- Organocatalysis bio-inspired by free radical mechanisms
- Molecular libraries for modified biological compounds
- Procedures for bioactivation of nanomaterials.

Industry participation

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Synthesis	Catalysis and materials
Biotechnology	Biomarkers and assays
Biology	Damage and repair
Pharmacology	Structure-activity
Health	Prevention and therapy



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