

ROS-Scavenging Magnetic Nanozymes with Remote Activation for Alzheimer Disease

ROSSCA

SUMMER SCHOOL Program Draft

Sketch of the Summer (Spring) School Activities and Programme

Training and Networking activities will pursue consolidation of scientific training and exchange between EU and Brazilian partners and scientific communities. For this purpose, the ROSSCA consortium will coordinate a middle-term meeting in the form of a Summer/Spring School, open to the specialists in the field and interested scientists, with the purpose of bringing the scientific community related to neurodegenerative diseases from different countries, especially oriented to young researchers. To facilitate participation of students and young researchers from different EU countries, the School will take place in Zaragoza, due to its logistic location near many large cities of France, UK, Portugal, Italy, and the entire Adriatic region, with direct flight/train access from those cities.

We will choose four main School themes related to world-class research taking place in the partner's home institutions. The main themes will be related to the scientific workflow of ROSSCA Project:

1. Magnetic Nanomaterials for actuation and biocatalysis.
2. Free Radicals and Fenton Chemistry.
3. Geno-Nanotoxicity.
4. Neurodegenerative diseases: primary cell and animal AD models.

Each selected theme aims to expand and complement the understanding about Nanozymes and their properties. Also, the advanced techniques applied within the framework of current hurdles related to neuroprotective applications, especially for Alzheimer's Disease (AD). The School is designed in a way that the main activities will be related to train young researchers for fresh thinking strategies and advanced techniques to solve these problems.

ROSSCA partners will seek for home institution approval for the validation of their young participants (undergraduate and graduate students) completing the Summer School Programme with a number of credits (approx. 3-6 ECTS credits). To gain these ECTS the participants should attend a minimum of 80% of the course and obtain a minimum score of 60% in a written exam designed by the School Professors, on the taught themes of the summer school. The teaching will include Lectures and seminars, keynote talks, presentations and reports by students, discussions, and individual tutorials during the School.

The Organizing Program Committee of the School will include 2-3 travel awards to select talented young undergraduate students to participate in the School. Students/young investigators will

receive financial, academic, and practical support for participating in activities and assessment work as enrichment of their curriculum.

The following Table describes the intended (approximate) Program for the Summer School

ROSSCA Summer School

Middle Term Meeting (somewhere between Months 17 - 19)

Activity		Session topics (tentative)
DAY 1		
9:00 – 9:30		Welcome Reception.
9:30 – 12:00	two Invited talks (by EU experts)	<ul style="list-style-type: none"> • Environmental Risk, Human Health, and Toxic Effects of Nanomaterials. • Current status of Fenton Chemistry.
12:00 – 12:30	Coffee break	
12:30 – 14:00	3 keynote talks	<ul style="list-style-type: none"> • Nanoparticles in Biomedicine. • Experimental Nanomaterial Techniques • Free radicals in biology, environment, the public health.
14:00 -15:30	Lunch	
15:30 – 18:00	Parallel Interactive Workshops	<ul style="list-style-type: none"> • Latest Characterization Techniques for Catalytic Systems and Enzyme-Like Activity • Biophysical characterization of magnetic nanoparticles in vitro and in vivo. • Basic concepts of Neurodegenerative Mechanisms in Biology. • Environmental factors potentially associated to Alzheimer Disease.
18:00 – 18:30	Coffee break	
18:30 – 20:00	Poster Session	<ul style="list-style-type: none"> • Nanomagnetism. • Novel effects in Magnetic Nanoparticles. • The situation and current trends of Neurodegenerative Disease Research in EU and Latin America.
	ROUND TABLE	
DAY 2		
9:00 – 11:00	Invited/oral presentations	<ul style="list-style-type: none"> • The relevance of Free radicals and ROS as targets for AD. • Impact of environmental nanoparticles on the public health.
11:00 – 11:30	Coffee break	
11:30 – 13:00	Tutorial	<ul style="list-style-type: none"> • Basic concepts and experimental approaches to Nanoparticle-Cell interactions.
13:00 - 15:00	Lunch	
15:00 – 18:00	Parallel Interactive Workshops	<ul style="list-style-type: none"> • Basic Concepts of Nanomagnetism. • Nanoparticle-based detection of free radicals. Short course. • Synergistic applications of magnetic heating and biocatalysis: current therapies.
18:00 – 18:30	Coffee break	
18:30 – 20:00	Poster Session	<ul style="list-style-type: none"> • Imaging free radicals. • Immuno-spin trapping • Fenton chemistry: In vitro and in vivo.

DINNER		
DAY 3		
9:00 – 11:00	Tutorials	<ul style="list-style-type: none"> • Detection and characterization of free radical species. • Magnetic Materials.
11:00 – 11:30	Coffee break	
11:30 – 13:00	Three Keynote (25 min) talks	<ul style="list-style-type: none"> • Biodegradation of the iron oxide. • Iron toxicity from catalytic activity. • Immunotherapy
13:00 - 15:30	Lunch	
15:30 – 18:00	Parallel Interactive Workshops	<ul style="list-style-type: none"> • Basic Concepts of Nanomagnetism. • Basics of Lipid Peroxidation. • Transition metal nanoparticles and free radical oxidations in cell membranes.
18:00 – 18:30	Coffee break	
18:30 – 20:00	Flash presentations	<ul style="list-style-type: none"> • Topics: Nanomaterial synthesis and reproducibility. • Experimental techniques for determining reactive species in cell cultures.
	ROUND TABLE	<ul style="list-style-type: none"> • ROS-related diseases: current status and therapeutic strategies.
DAY 4		
9:00 – 12:00	Assessment	Written examination by the students
CLOSING REMARKS		
12:00 – 14:00	LUNCH	
14:30 - 20:00	ROSSCA PROJECT MEETING (restricted to Partners of the consortium)	
	Exposition of last results	
	Scientific scenario for the 2 nd term	
	Planning of research and exchange for the 2 nd term.	
	Experiments	
	Other	
CLOSING		