

## NESTOR Project

### Sketch of the Summer School Activities and Programme

Networking activities will pursue consolidation of scientific training and exchange between EU and Latin American scientific communities. For this purpose, the NESTOR consortium will organize a middle-term meeting in the form of Summer School, open to the general public with the purpose of gathering the scientific community from different countries, especially oriented to young researchers. To facilitate participation of students and young researchers from different EU countries, the Summer 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 Summer 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 NESTOR Project:

1. Magnetic Nanomaterials.
2. Free Radicals and Fenton Chemistry.
3. Eco-Nanotoxicity and Geno-Nanotoxicity.
4. Environmental and Clinical uses of nanozymes.

Each selected theme aims to expand and complement the understanding about Nanozymes, their properties and the advanced techniques for their study, within the framework of current environmental and biomedical problems. The Summer 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.

NESTOR partners will seek for home institution approval for the validation of the ESR's (undergraduate and graduate students) participants 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 50% 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 3-4 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

## NESTOR Summer School and Middle Term Meeting

(4 days, somewhere between M23 - M25)

Activity		Session topics (tentative)
<b>DAY 1</b>		
9:00 – 9:30		Welcome Reception.
9:30 – 12:00	<b>two Invited talks (by EU experts)</b>	<ul style="list-style-type: none"> <li>• Environmental Risk, Human Health, and Toxic Effects of Nanomaterials.</li> <li>• Current status of Fenton Chemistry.</li> </ul>
12:00 – 12:30	<b>Coffee break</b>	
12:30 – 14:00	<b>3 keynote talks</b>	<ul style="list-style-type: none"> <li>• Nanoparticles in Biomedicine.</li> <li>• Experimental Nanomaterial Techniques</li> <li>• Free radicals in environment, the industry and the public health.</li> </ul>
14:00 -15:30	<b>Lunch</b>	
15:30 – 18:00	<b>Parallel Interactive Workshops</b>	<ul style="list-style-type: none"> <li>• Atomistic Modelling Techniques for Catalytic Systems and Enzyme-Like Activity</li> <li>• Biophysical characterization of magnetic nanoparticles in vitro and in vivo.</li> <li>• Basic concepts of Electron Paramagnetic Resonance. ROS detection techniques</li> <li>• Design rules for catalytic nanoparticle synthesis.</li> </ul>
18:00 – 18:30	<b>Coffee break</b>	
18:30 – 20:00	<b>Poster Session</b>	<ul style="list-style-type: none"> <li>• Nanomagnetism.</li> <li>• Novel effects in Magnetic Nanoparticles.</li> </ul>
	<b>ROUND TABLE</b>	<ul style="list-style-type: none"> <li>• The situation and current trends of Waste Management Research in EU and Latin America.</li> </ul>
<b>DAY 2</b>		
9:00 – 11:00	<b>Invited/oral presentations</b>	<ul style="list-style-type: none"> <li>• The relevance of Free radicals for water remediation.</li> <li>• Impact of nanoparticles on aquatic organisms and their ecosystems.</li> </ul>
11:00 – 11:30	<b>Coffee break</b>	
11:30 – 13:00	<b>Tutorial</b>	<ul style="list-style-type: none"> <li>• Basic concepts and experimental approaches to Nanoparticle-Cell interactions.</li> </ul>
13:00 - 15:00	<b>Lunch</b>	
15:00 – 18:00	<b>Parallel Interactive Workshops</b>	<ul style="list-style-type: none"> <li>• Basic Concepts of Nanomagnetism.</li> <li>• Nanoparticle-based detection of free radicals. Short course.</li> <li>• Synergistic applications of magnetic heating and biocatalysis: current therapies.</li> </ul>
18:00 – 18:30	<b>Coffee break</b>	
18:30 – 20:00	<b>Poster Session</b>	<ul style="list-style-type: none"> <li>• Imaging free radicals.</li> <li>• Immuno-spin trapping</li> <li>• Fenton chemistry: In vitro and in vivo.</li> </ul>
<b>DINNER</b>		
<b>DAY 3</b>		
9:00 – 11:00	<b>Tutorials</b>	<ul style="list-style-type: none"> <li>• Detection and characterization of free radical species.</li> <li>• Magnetic Materials.</li> </ul>
11:00 – 11:30	<b>Coffee break</b>	

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