

Personal details

HARDY Micael

Current position/ Function

Assistant Professor / PhD, DSc

French public organisation(s)

Organisation	Laboratory
Aix Marseille University	Laboratoire Institut de Chimie Radicalaire (ICR) / UMR 7273, SREP team https://icr.univ-amu.fr/fr/

Previous positions

Start date	End date	Town	Organisation	Function
02/2006	02/2008	Milwaukee	Medical College of Wisconsin	Postdoctorat
10/2004	10/2005	Marseille	Université de Provence	Temporary research & teaching assistant

Education

DSc. (HDR). 2019. Aix-Marseille Université, ICR, SREP team. Title. Superoxide probes: synthesis, characterization and applications

PhD. 2005. PhD. in Organic chemistry (MRT fellowship), Université de Provence. Supervisor: Pr. P. Tordo. Title. Synthesis and in vitro spin trapping applications of DEPMPO type nitrones

Personal Statement

I am responsible of the thematics:
probes for oxidative stress
mitochondria-targeting agents to target cancer metabolism.

The relationship between the design of new probes for free radical detection and their application for a better understanding of the implication of free radicals in biological processes is the core of my research activity. I have contributed to the discovery of the currently most efficient nitron spin traps for the detection of the superoxide radical ($O_2^{\bullet-}$). Since my thesis works, I am heavily involved in the design of spin traps with improved performances, notably with a focus on the lifetime of the paramagnetic adducts, the trapping rate of the $O_2^{\bullet-}$, and the targeting of the spin trap to the spot of interest such as mitochondria, cancer cells. During my post-doctoral work, we were able to detect for the first time by EPR the production of $O_2^{\bullet-}$ by isolated intact mitochondria using a mitochondria-targeted spin trap. In order to combine the powerful properties of the spin trapping technique for the detection, characterization, and identification of free radicals with the high sensitivity of the Western blot detection, a series of DEPMPO-based spin traps linked to biotin moiety were synthesized and evaluated in biological systems. The fine design of new probes has helped clarify the implication of $O_2^{\bullet-}$ in various biological processes, and this tool has led to advances in the understanding of the role of $O_2^{\bullet-}$ and peroxynitrite in biological oxidative processes.

I have had a strong and fruitful collaboration with the biophysics department of the Medical College of Wisconsin over the past 17 years, based on the design and development of mitochondria-targeted spin traps, spin labels, reactive-oxygen-species-specific fluorescence probes to improve the detection of free radicals using different techniques (EPR spin trapping, fluorescence, optical stopped-flow, and HPLC techniques), and bioactive compounds as potential therapeutics. I have co-authored 57 articles, 11 patents, and 4 book chapters, 19 conferences in international congress (9 invited seminars). I coordinated ANR (PRC, 3 partners), regional grant (3 partners) and he is a partner of several international grants (NIH R01, colciencias). I am also director of an International Research Program (IRP).

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