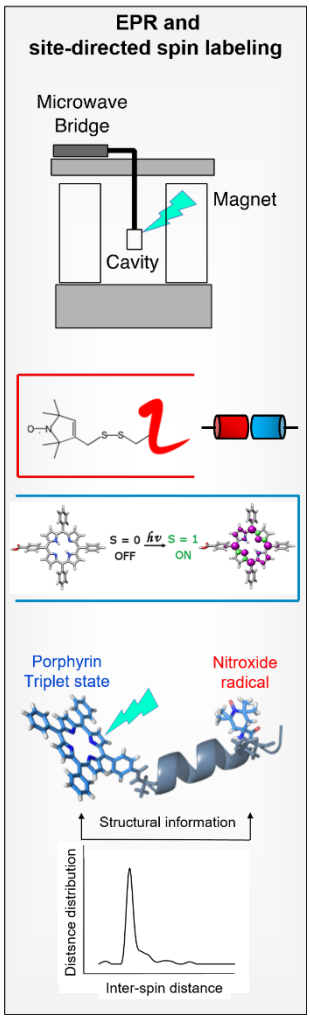
Title	Innovative spin labels for distance measurements in biologically relevant systems by light-induced EPR spectroscopy
PI	Di Valentin Marilena
Research Group	EPR Spectroscopy
Curriculum	Scienze Chimiche
Location	DISC
Contact	**web:** www.chimica.unipd.it/eprlab
	email: marilena.divalentin@unipd.it

Project description:



Pulsed Dipolar (PD) EPR spectroscopy, an arsenal of pulsed techniques which measure dipolar interactions between spin labels attached at well-defined protein sites, provides distance and distance distribution constraints in the nanometer range. Light-induced PD-EPR, pioneered by the EPR group, offers advantageous features to capture protein structure. Photoexcited triplet state spin labels have demonstrated outstanding spectroscopic properties, *in primis* high sensitivity due to hyperpolarization.

The main objective of this project is to identify and test new photoswitchable spin probes for the structural characterization of protein-protein complexes based on PD-EPR. Importantly, spin labeling of both partners will allow the direct probe of the interaction between biomolecules. The potential of the photoswitchable labels will be explored in different biologically-relevant systems, characterized by an increasing complexity from *in vitro* to *in vivo*, this latter a condition where the two partners play their biological function. The cellular environment will be gradually approached by choosing the best-performing chromophores, implementing the most appropriate spin labeling strategy and optimizing the EPR experiment. The spectroscopic investigation on well-known protein-peptide and protein-protein complexes, will allow us to focus on methodological development.

Hosting group(s) for the period abroad (tentative list, may change):
Prof. Marina Huber, Leiden EPR group, Huygens Kammerlingh Onnes lab at the Leiden University