

**Utilization of EPR detection to monitor nutritionally-induced oxidative stress in rats**

Jerome Busserolles, Edmond Rock, Yves Rayssiguier, Andrzej Mazur

EPR is mostly used in biological studies to measure direct and indirect indicator of free radical damage. Experimental data from the laboratory illustrated the usefulness of spin-trapping technique using EPR to detect increased primary hydroxyl radicals production in magnesium deficient rats muscles. Moreover, spin labeling technique and EPR to monitor the physical properties of lipid bilayer membranes have been used in copper deficient rats. This allowed to draw relationships between membrane physical properties and oxidative stress-induced dysfunction in this model. Moreover, beside those well recognized utilization of EPR and because of its high specificity, we used EPR detection to monitor total antioxidant capacity (TAC) in plasma. We improved a method, defined as Lat-RPE, which is based on the principle of the original Trolox Equivalent Antioxidant Capacity, and using EPR detection of the lag time for ABTS cation radical appearance. We applied this method in nutritional models of antioxidant depletion and of oxidative stress, i.e. respectively vitamin E deficiency and high sucrose diet in rats. Altogether, allowing the evaluation of the prevention capacity of antioxidants in plasma against ROS-induced damage to biomolecular targets, our results are in favor of the use of Lat-RPE as a biomarker of oxidative stress.