

# From Antioxidants to Redox Medicine

*How to Evaluate Oxidative Stress and Protect Redox Homeostasis?*

June 21, 2023

Paris, France

REDOX  
MEDICINE  
SOCIETY

The logo for the Redox Medicine Society features the word "REDOX" in a bold, sans-serif font, with a stylized "X" that is a circle divided into four quadrants. Below "REDOX" are the words "MEDICINE" and "SOCIETY" in a smaller, all-caps, sans-serif font, stacked vertically.

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The annual workshop of the Redox Medicine Society (RMS), "Oxidative Stress and Antioxidants - How to assess Antioxidant Activity?" will be updated this year. The workshop now takes the following title: "**Oxidative Stress: From Antioxidants to Redox Medicine**".

## Context:

Redox balance *in vivo* is an essential pillar for the maintenance of good health. The disruption of this balance is most often the result of oxidative stress (acute or chronic); a disruption of the balance between antioxidant defenses and ROS (activated species of O<sub>2</sub>). In its chronic form, oxidative stress accelerates aging and contributes to the appearance of several pathologies linked to aging such as cancers, cardiovascular diseases, neurodegenerative diseases. Our lifestyles and some inappropriate eating habits accentuate this disruption of redox homeostasis.

However, we now know that the excess of ROS not only have the effects of simply destroying their environment, but also act, indirectly, on the cellular machinery responsible for defending redox homeostasis in cells, tissues and organs. Produced at a physiological, controlled dose, ROS are stimulators or repressors of signal transduction towards the expression of many genes. It is therefore logical to try to prevent, limit, or even correct, any disruption of the redox balance, by combating the excessive formation of ROS. The first means was the use of exogenous antioxidants responsible for neutralizing excess ROS and compensating for the failure of antioxidant defense systems. Nevertheless, a broader concept slowly appeared: **Redox Medicine**.

Redox medicine encompasses and goes beyond the use of exogenous antioxidants to add a stimulating or repressing action on the various mechanisms of defense of the redox balance: stimulation or repression of enzymatic activities, stimulation or repression of the expression of proteins by action on the genes and/or on the transduction of the signal, etc. This field is in full expansion.

To prevent or treat a disruption in the redox balance (and the development of pathologies linked to it), it is necessary to identify this break, to locate it and to understand its mechanisms in order to be able to apply the tools of Redox medicine at the right time and in the right place.

## Objectives of 2023 workshop:

The objectives of these training days are as follows:

- *To present de latest scientific advances and perspectives on oxidative stress and antioxidants*
- *To present in details the methods for evaluating antioxidant activity in different matrices, and to give some examples*
- *To explain the nature and the importance of the redox homeostasis, and the consequences of its failure when an oxidative stress occurs*
- *To introduce the concept of redox medicine and discuss the methods needed to identify and evaluate a rupture of the redox homeostasis in human*
- *To present the main possible applications of redox medicine and the tools that can be used.*

Looking forward to meeting you very soon, please don't hesitate to contact us for any further information.

Best regards,



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## Program

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14:00 Welcome of Participants

14:05 Introduction of the workshop

### Session 1 - Reactive species derived from oxygen (ROS) and antioxidants

- Reactivity of oxygen with respect to living matter and the need for catalysts
- Free radical-oxidant distinction
- The cascade of oxidants derived from O<sub>2</sub>
- The redox potential
- The antioxidants: history of their development, mechanisms of action (stoichiometric action versus anticatalytic action), synthetic versus natural antioxidants
- Natural antioxidants: some technical data (extraction, purification, identification and quantification)

15:30 Coffee Break

### Session 2 - The different methods to measure an antioxidant power

- Chemical methods (spectrophotometry, fluorescence, chemiluminescence)
- Ex vivo methods (cell cultures, isolated blood cells, tissues and biological fluids)
- Anti-catalytic methods and combined methods
- Lipoperoxidation measurement methods
- Electrochemical methods and electron paramagnetic resonance (EPR)
- Some examples of antioxidant power measurement (food, food additives, cosmetics)

### Session 3 - REDOX Homeostasis: From Antioxidants to Redox Medicine

- Brief history of the redox medicine concept
- The redox status *in vivo*: homeostasis and pathologies linked to redox equilibrium rupture
- ROS, beneficial or harmful for the *in vivo* redox status? Oxidative stress versus physiological ROS production
- How can we measure the redox status *in vivo*?
- How can we act on the redox status *in vivo*?

17:20 Discussion

Do you have any questions? Come with your project! We will discuss it and we will give you all the keys and supports

18:00 End of the workshop

## Registration

You can register to the Redox Medicine workshop alone, but you also have the option to register for both our workshop and congress, Redox Medicine 2023, at the same time.

Registration

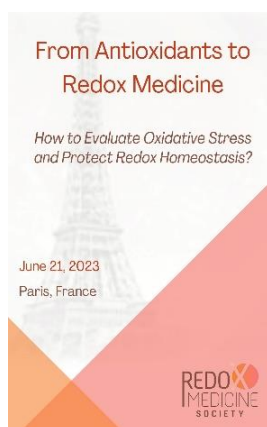
## Who should attend ?

Are you a general practitioner, biologist, geneticist, researcher in oncology, neuroscience and pediatrics, or metabolic diseases? Research director, R&D director, engineer, research assistant, or business leader? You want to learn more about oxidative stress, antioxidants & redox medicine, their key roles in the cellular metabolism, last analytical tools and methods.

## Teaching Resources

- Presentation support given to participants
- Presentation proposed by the speaker via Power Points
- Q&A session with all participants

## Workshop Report & Recorded Video



Participants will receive a report book including the different sessions of workshop, along with practical information on them.

In case you cannot attend the workshop, you can still get the report book in PDF format by contacting us.



Workshop replay will also be available for attendees. Recording access will also be available for everybody upon request.

Contact us