



Universitat de Lleida

GUIA DOCENT  
**ESTRES OXIDATIU I  
ANTIOXIDANTS**

Coordinació: Dr. Joaquim Ros  
Dr. Reinald Pamplona

Any acadèmic 2015-16

## Informació general de l'assignatura

<b>Denominació</b>	ESTRES OXIDATIU I ANTIOXIDANTS
<b>Codi</b>	14706
<b>Semestre d'impartició</b>	Primer
<b>Caràcter</b>	Optativa
<b>Nombre de crèdits ECTS</b>	4
<b>Grups</b>	1
<b>Crèdits teòrics</b>	3
<b>Crèdits pràctics</b>	1
<b>Coordinació</b>	Dr. Joaquim Ros Dr. Reinald Pamplona
<b>Departament/s</b>	Ciències Mèdiques Bàsiques; Medicina Experimental
<b>Distribució càrrega docent entre la classe presencial i el treball autònom de l'estudiant</b>	Teoria: Hores dedicades a l'activitat formativa: 30; Porcentatge de presencialitat: 100% Assistència a conferències científiques i pràctiques orals comunicatives: Hores dedicades a l'activitat formativa: 10; Porcentatge de presencialitat: 100% Treball autònom: Hores dedicades a l'activitat formativa: 60; Porcentatge de presencialitat: 0%
<b>Modalitat</b>	Presencial
<b>Informació important sobre tractament de dades</b>	Consulteu <a href="#">aquest enllaç</a> per a més informació.
<b>Idioma/es d'impartició</b>	Català Castellà Anglès
<b>Grau/Màster</b>	Master's Degree in Biomedical Research
<b>Distribució de crèdits</b>	1. Oxidative Stress Biology (1,4 crèdits) 2. Oxidative Stress in Medicine (1,0 crèdits) 3. Antioxidants and Nutrition (0,6 crèdits) 4. Seminars and other activities (1,0 crèdits)
<b>Adreça electrònica professor/a (s/es)</b>	victoria.ayala@mex.udl.cat jboada@mex.udl.cat elisa.cabiscol@cmb.udl.cat reinald.pamplona@mex.udl.cat manuel.portero@mex.udl.cat joaquim.ros@cmb.udl.cat jceserrano@mex.udl.cat jordi.tamarit@cmb.udl.cat

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## Objectius acadèmics de l'assignatura

To define and identify free radicals

To recognize the chemistry and biological sources of free radicals and other reactive molecular species

To define the concept of cellular stress

To know, at molecular level, the cellular defense mechanisms in front of oxidative stress

To characterize the free radical-derived molecular damage

To know methods for the detection and quantification of both free radicals and biomarkers of molecular damage

To identify and characterize antioxidant systems, locations and mechanisms of action

To recognize free radical biological effects and adaptive cellular mechanisms

To identify and recognize xenobiotics mechanisms of action and their nutritional and medical implications

To recognize the role of free radicals in pathological processes

To identify natural sources of antioxidants and its role in human nutrition

To acquire skills to analyze and communicate the scientific information

## Competències

### COMPETENCES

CB1 Possess knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often within a research context

CB2 Being able to apply the acquired knowledge and have the ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study

CB4 Being able to communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences in a clear and unambiguous

CG1 Knowing how to select and apply different analytical methods at the molecular, biochemical, cellular, genetic and phenotypic level for the diagnosis and study of the diseases.

CG4 Capacity for critical and creative thinking with their own work and that of other researchers

CE9 That the students can identify the effects of oxidative stress, the cellular mechanisms of stress response and being able to apply the methods of detection and quantification of free radicals and molecular biomarkers of injury

CT1 Having a correct oral and written expression

## Continguts fonamentals de l'assignatura

## 1. Oxidative Stress Biology (14 hours)

An introduction to oxygen toxicity and reactive species (1h)

The chemistry of free radicals and related 'reactive species' (2h)

Oxidative-derived molecular damage (3h)

Measurement of free radicals and molecular damage (3h)

Endogenous antioxidant defences (3h)

Cellular responses to oxidative stress: adaptation and repair (2h)

Cellular redox signaling (2h)

## 2. Oxidative Stress in Medicine (10 hours)

Oxidative stress, aging and longevity (2h)

Oxidative stress in human diseases (8h)

## 3. Antioxidants and Nutrition (6 hours)

Diet-derived antioxidant defences (3h)

Antioxidants in human nutrition (3h)

## 4. Seminars and other activities (10h/alumne)

Seminars: 4 groups (n = 3 x group)

Laboratory respirometry: 2 groups

Discussion of scientific papers: An article presentation x group for each field (1.OSB; 2. OSM; 3. A&N).  
Presentation duration: 20 min.

Conferences: According to the IRB 'Friday Seminars'

## Eixos metodològics de l'assignatura

El proceso de enseñanza-aprendizaje se llevará a cabo mediante:

1 Clases magistrales

2 Conferencias científicas

3 Debate dirigido: análisis y discusión de trabajos científicos

4 Clases prácticas

## Pla de desenvolupament de l'assignatura

El proceso de enseñanza-aprendizaje se llevará a cabo mediante:

1 Clases magistrales

2 Conferencias científicas

3 Debate dirigido: análisis y discusión de trabajos científicos

4 Clases prácticas

## Sistema d'avaluació

Two intermediate evaluation activities for theoretical contents (30%+30%), 1 evaluation activity for scientific seminars (presentation, analysis skills and discussion) (30%), and 1 evaluation laboratory activity (10%).

## Bibliografia i recursos d'informació

### **Textbooks**

Free Radicals in Biology and Medicine. Editat per Halliwell B i Gutteridge JMC. Oxford University Press, New York, 2007.

Redox Proteomics: From Protein Modifications to Cellular Dysfunction and Diseases. Isabella Dalle-Donne (Editor), Andrea Scaloni (Editor), D. Allan Butterfield (Editor) (2006)

### **Internet Resources**