



Universitat de Lleida

GUIA DOCENT
**ESTRES OXIDATIU I
ANTIOXIDANTS**

Any acadèmic 2014-15

Informació general de l'assignatura

Denominació	ESTRES OXIDATIU I ANTIOXIDANTS
Codi	14706
Semestre d'impartició	Anual
Caràcter	Optativa
Nombre de crèdits ECTS	4
Crèdits teòrics	0
Crèdits pràctics	0
Departament/s	Ciències Mèdiques Bàsiques
Modalitat	Presencial
Informació important sobre tractament de dades	Consulteu aquest enllaç per a més informació.
Distribució de crèdits	<p>1. Oxidative Stress Biology (16 hours) An introduction to oxygen toxicity and reactive species (1 hour) The chemistry of free radicals and related 'reactive species' (2 hour) Oxidative-derived molecular damage (3 hour) Measurement of free radicals and molecular damage (3 hour) Endogenous antioxidant defences (3 hour) Cellular responses to oxidative stress: adaptation and repair (2 hour) Cellular redox signalling (2 hour)</p> <p>2. Oxidative Stress in Medicine (9 hours) Free radicals and toxicology (3 hour) Oxidative stress, aging and longevity (3 hour) Oxidative stress in human diseases (3 hour)</p> <p>3. Antioxidants and Nutrition (5 hours) Diet-derived antioxidant defences (3 hour) Antioxidants in human nutrition (2 hour)</p> <p>4. Seminars (20 hours) Discussion of scientific papers (15 hours) Conferences (5 hours)</p>
Adreça electrònica professor/a (s/es)	joaquim.ros@cmb.udl.cat reinald.pamplona@mex.udl.cat victoria.ayala@mex.udl.cat jboada@mex.udl.cat elisa.cabiscol@cmb.udl.cat manuel.portero@mex.udl.cat jceserrano@mex.udl.cat jordi.tamarit@cmb.udl.cat

Name

Joaquim Ros

Reinald Pamplona

Victoria Ayala

Jordi Boada

Elisa Cabiscol

Manuel Portero

José Serrano

Jordi Tamarit

Informació complementària de l'assignatura

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)

Achievements

CB1 Achieve knowledge and understanding that provide bases for originality in developing and / or applying ideas 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 -the data and the rationale underpinning these- to specialist and non-specialist audiences with clarity and unambiguity (*)

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

Master's Degree in Biomedical Research

Teaching Plan

Universitat de Lleida

Oxidative Stress and Antioxidants

Code: 14706

Module: III. Advanced Methods in Biomedicine

Academic course: 2013-2014

Period: C1/S1

Centre: Faculty of Medicine

Departments:

Dept. of Basic Medical Sciences

Dept. of Experimental Medicine

Teaching languages: Catalan, Spanish and English

Student work:

4 ECTS = 40 hours on-site

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

OBJECTIVES

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

PROFESSORATE

Coordinators:

Dr. Joaquim Ros (e-mail: joaquim.ros@cmb.udl.cat)

Professorate:

Name	Office	e.mail	Phone
Joaquim Ros		joaquim.ros@cmb.udl.cat	973702275-2407-2475
Reinald Pamplona		reinald.pamplona@mex.udl.cat	973702408
Victoria Ayala		victoria.ayala@mex.udl.cat	973702408
Jordi Boada		jboada@mex.udl.cat	973702265
Elisa Cabiscol		elisa.cabiscol@cmb.udl.es	973702275-2407-2475
Manuel Portero-Otin		manuel.portero@mex.udl.cat	973702408
José Serrano		jeserrano@mex.udl.cat	973702265
Jordi Tamarit		jordi.tamarit@cmb.udl.cat	973702475

SUBJECT CONTENTS

1. Oxidative Stress Biology (OSB. 14 hours)

An introduction to oxygen toxicity and reactive species (0,5 hour)

The chemistry of free radicals and related 'reactive species' (0,5 hour)

Oxidative-derived molecular damage (2 hour)

Measurement of free radicals and molecular damage (1 hour)

Endogenous antioxidant defences (4 hour)

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

Cellular redox signaling (2 hour)

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

Free radicals and toxicology (3 hour)

Oxidative stress, aging and longevity (3 hour)

Oxidative stress in human diseases (3 hour)

3. Antioxidants and Nutrition (A&N. 6 hours)

Diet-derived antioxidant defences (3 hour)

Antioxidants in human nutrition (2 hour)

4. Seminars (20 hours) (10h/student)

-Individual presentations of scientific papers (for OSB)

Lab: Respirometry (3 hours) 2 groups(J: Boada). Dates: 17/12 (group1) i 20/12 (group 2)

Discussion of scientific papers (15 hours)

Each group will present an article related to each of the three main parts 2 OSM;. 3.A&N).

Presentations: 20 minutes each article:

Dates 7, 10 & 15 January 2014

Conferences (5 hours):

EVALUATION

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

Part 1 (OSB): November 27th . Thursday. 16 h.

Parts 2 and 3 (OSM and A&N: At the end (exact date: to be determined)

BIBLIOGRAPHIC AND INTERNET RESOURCES

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