



Syllabus

Subject

Subject / Group	11259 - Biomembranes and Lipids. Nutrition-related Fundamentals. / 1
Degree	Master's in Nutrigenomics and Personalised Nutrition
Credits	3
Period	2nd semester
Language of instruction	Spanish

Professors

Lecturers	Office hours for students					
	Starting time	Finishing time	Day	Start date	End date	Office / Building
Barbara Reynes Miralles barbara.reynes@uib.es						You need to book a date with the professor in order to attend a tutoring session.
Juana Sánchez Roig joana.sanchez@uib.es						You need to book a date with the professor in order to attend a tutoring session.

Context

The aim of the course is to provide a general overview about biomembranes and lipids focusing the interest in the field of nutrition. The course will focus on three main points: (1) to study the structure, dynamic and function of the cell membrane for a comprehensive understanding of its vital role, (2) to examine functional aspects of the cell membrane and lipids related to metabolic disorders and other diseases and (3) to analyze research methodologies applied in the field of lipidomics and biomembranes.

The course will help you to understand specific subjects of the Master.

Requirements

Recommended

In order to achieve the objectives of the course, students would have basic knowledge of the different disciplines of Life Sciences.

Skills

Specific

- * 1- To provide you with a conceptual framework for understanding the cell membrane as a supramolecular dynamic system. 2- To analyse the role of bioactive lipids as signaling and regulatory molecules in



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cell functions. 3- To familiarise with methodological aspects in the research field of biomembranes and lipidomics.

Generic

- * 1- Capacity to prepare a report and give an oral presentation at an academic level. 2- Ability to develop their work in English (International scientific language). 3- Knowing the capabilities and potential of ICT (information and communication technologies) in the area of the discipline. 4- Capacity to analyse and evaluate experimental data and related scientific information

Basic

- * You may consult the basic competencies students will have to achieve by the end of the Master's degree at the following address: http://estudis.uib.cat/master/comp_basiques/

Content

Range of topics

- Topic 1. Biological Membranes
Structure and functions of the cell membrane. Methods for isolation and characterization of biological membranes.
- Topic 2. Membrane lipids
Membrane lipid classes. Membrane fluidity. Lipid membrane domains. The membrane lipid component and health: scientific evidences.
- Topic 3. Lipid research
Methods for lipid analysis. Introduction to lipidomic analysis.
- Topic 4. Membrane signaling
Signalling by membrane receptors. Lipids in cell signaling
- Topic 5. Bioactive lipids
Sphingolipids as bioactive lipids. Implications in human health.

Teaching methodology

Workload

The following table shows the distribution in hours of the different attended and non-attended student activities and their equivalent in credits according to the European Credit Transfer and Accumulation System. (1 ECTS credit = 25 hours of estimated student workload).

In-class work activities (0.72 credits, 18 hours)

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Modality	Name	Typ. Grp.	Description	Hours
Theory classes	Lectures	Large group (G)	The aim of the lectures is to convey scientific background knowledge and critical information. This goal will be achieved by oral presentation of the topics by the professor. Active participation of the students in form of questions or critical remarks will help to provide a more dynamic teaching environment. Study questions, recommended readings and article comments will accompany the lectures. They form an integral part of the methodology. Class attendance will suppose the 20% of the final mark for those students who follows path A.	8
Seminars and workshops	Exercises and activities	Medium group (M)	Supplementary reading activities will be provided to the students to work on them. The analysis of scientific articles will help the students to a better understanding of the scientific knowledge summarised in the oral presentations of the topics (20% of final mark for path A)	4
Seminars and workshops	Oral Presentation	Medium group (M)	The aim of this activity is to engage the student himself in the preparation of an oral presentation about an academic subject related to the course topics. The oral presentation in the format Microsoft Powerpoint will be conducted by each student in front of their fellow students. For the oral presentation, each student will have a maximum of 25 min and afterwards, the student must answer specific questions set by the audience during at least 10 min (40% of final mark for path A)	4
Assessment	Exam	Large group (G)	Exam (50% of the final mark for path B)	2

At the beginning of the semester a schedule of the subject will be made available to students through the UIBdigital platform. The schedule shall at least include the dates when the continuing assessment tests will be conducted and the hand-in dates for the assignments. In addition, the lecturer shall inform students as to whether the subject work plan will be carried out through the schedule or through another way included in the Aula Digital platform.

Distance education tasks (2.28 credits, 57 hours)

Modality	Name	Description	Hours
Individual self-study	Study	The lectures must be summarized by the students in order to consolidate their knowledge about the specific matter. Any doubts and questions arising during self-study will be solved during the next lecture and the exercise sections	12
Individual self-study	Preparation of a 3-pages report	The report must be prepared as a digital file and the maximum extension will be 3 pages about the oral presentation topic assigned (20% of the final mark for path A)	10
Individual self-study	Preparation of a bibliographic report	A bibliographic report must be prepared as a digital file about a topic assigned by the professor (30% of the final mark for path B)	0
Individual self-study	Preparation of an oral presentation	The oral presentation must be prepared as a digital file in the format Microsoft Powerpoint. The maximum time for the oral presentation will be	25

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Modality	Name	Description	Hours
		25 min. Both digital files (report and oral presentation) must be presented to the professor 4 days in advance to the oral presentation data.	
Group or individual self-study	Exercises and activities	By solving exercises, reading scientific articles and comments on articles, students will seat general concepts summarised in the lectures. The exercises and activities must be done the day set for it on the subject timetable. Some activities will be done during the lecture section (20% of final mark for path B).	10

Specific risks and protective measures

The learning activities of this course do not entail specific health or safety risks for the students and therefore no special protective measures are needed.

Student learning assessment

Student learning assessment

The student will receive a numerical mark between 0 and 10 in each of the activities listed in the following table, being 10 the highest possible mark. The minimum total mark to regard an activity or the entire course as successfully completed is 5. The total mark will be calculated from the marks of the distinct activities as indicated in the scheme below.

Frau en elements d'avaluació

In accordance with article 33 of Regulation of academic studies, "regardless of the disciplinary procedure that may be followed against the offending student, the demonstrably fraudulent performance of any of the evaluation elements included in the teaching guides of the subjects will lead, at the discretion of the teacher, a undervaluation in the qualification that may involve the qualification of "suspense 0" in the annual evaluation of the subject".

Lectures

Modality	Theory classes
Technique	Observation techniques (non-retrievable)
Description	The aim of the lectures is to convey scientific background knowledge and critical information. This goal will be achieved by oral presentation of the topics by the professor. Active participation of the students in form of questions or critical remarks will help to provide a more dynamic teaching environment. Study questions, recommended readings and article comments will accompany the lectures. They form an integral part of the methodology. Class attendance will suppose the 20% of the final mark for those students who follows path A.
Assessment criteria	Those students following path A need a minimum assistance of 80%. Failure to comply with the minimum attendance will suppose to follow the path B
Final grade percentage: 20% for pathway A with a minimum grade of 8	
Final grade percentage: 0% for pathway B	

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Exercises and activities

Modality	Seminars and workshops
Technique	Real or simulated task performance tests (non-retrievable)
Description	Supplementary reading activities will be provided to the students to work on them. The analysis of scientific articles will help the students to a better understanding of the scientific knowledge summarised in the oral presentations of the topics (20% of final mark for path A)
Assessment criteria	During the classes, applied exercises will be proposed that will help the students to better understand scientific knowledge. These exercises will be based on the analysis of scientific articles, use of databases, etc.

Final grade percentage: 20% for pathway A

Final grade percentage: 0% for pathway B

Oral Presentation

Modality	Seminars and workshops
Technique	Oral tests (non-retrievable)
Description	The aim of this activity is to engage the student himself in the preparation of an oral presentation about an academic subject related to the course topics. The oral presentation in the format Microsoft Powerpoint will be conducted by each student in front of their fellow students. For the oral presentation, each student will have a maximum of 25 min and afterwards, the student must answer specific questions set by the audience during at least 10 min (40% of final mark for path A)
Assessment criteria	The conduction of the oral presentation will be assessed with the help of a rubric as scoring tool. The set of criteria used in the applied rubric will have been handed out to the students before the oral presentation.

Final grade percentage: 40% for pathway A

Final grade percentage: 0% for pathway B

Exam

Modality	Assessment
Technique	Objective tests (retrievable)
Description	Exam (50% of the final mark for path B)
Assessment criteria	Objective evaluation tests

Final grade percentage: 0% for pathway A

Final grade percentage: 50% for pathway B with a minimum grade of 4.5

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Preparation of a 3-pages report

Modality	Individual self-study
Technique	Papers and projects (retrievable)
Description	The report must be prepared as a digital file and the maximum extension will be 3 pages about the oral presentation topic assigned (20% of the final mark for path A)
Assessment criteria	Preparation of a written report about an academic subject related to the course topics, of a maximum extension of 3-leafs

Final grade percentage: 20% for pathway A

Final grade percentage: 0% for pathway B

Preparation of a bibliographic report

Modality	Individual self-study
Technique	Papers and projects (retrievable)
Description	A bibliographic report must be prepared as a digital file about a topic assigned by the professor (30% of the final mark for path B)
Assessment criteria	Preparation of a written report about an academic subject related to the course topics

Final grade percentage: 0% for pathway A

Final grade percentage: 30% for pathway B with a minimum grade of 4.5

Exercises and activities

Modality	Group or individual self-study
Technique	Real or simulated task performance tests (non-retrievable)
Description	By solving exercises, reading scientific articles and comments on articles, students will seat general concepts summarised in the lectures. The exercises and activities must be done the day set for it on the subject timetable. Some activities will be done during the lecture section (20% of final mark for path B).
Assessment criteria	Delivery of specific tasks and exercises. Exercises will be based on the analysis of scientific articles, use of databases, etc.

Final grade percentage: 0% for pathway A

Final grade percentage: 20% for pathway B

Resources, bibliography and additional documentation

Basic bibliography

Course discussion will focus on relevant chapters from text books and on scientific literature that students will find on pudmed data base. Recommended text books:

- Biochemistry. Voet D, Voet JG. (2004) John Wiley & Sons, Inc..
- Molecular Cell Biology. H. Lodish (2007). WH Freeman and Company
- The Cell. B. Alberts (2002). Garland Science. Taylor & Francis Group.
- Biochemistry. L. Stryer (2007). W.H. Freeman and Company, N.Y.

Complementary bibliography

Specific bibliography:





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- The Membranes of Cells. P.L. Yeagle (1993). Academic Press. San Diego. (Chapters 1, 6, 7).
- Membrane Analysis. J. M. Graham and J.A. Higgins (1997). Taylor & francis.
- Life-as a Matter of Fat: The Emerging Science of Lipidomics. Ole G. Mouritsen (2005). Springer-Verlag. Berlin. Heidelberg.
- Membrane Lipid Signaling in Aging and Age-Related Disease. M.P. Mattson (2003). Elsevier. ISBN: 978-0-444-51297-0

Other resources

World Wide Web Resources as indicated by the professor.

