



IDENTIFYING DATA

Proteomics: from Protein Sequence to Fuction

Subject	Proteomics: from Protein Sequence to Fuction			
Code	V02M123V01203			
Study programme	(*)Máster Universitario en Ciencias Biolóxicas: Biología Molecular, Computacional e Ambiental e Bio-Industrias			
Descriptors	ECTS Credits	Type	Year	Quadmester
	6	Optional	1st	2nd
Language	English			
Department				
Coordinator	Pérez Diz, Ángel Eduardo			
Lecturers	Bodelón González, Gustavo Carrera Mouriño, Mónica Pérez Diz, Ángel Eduardo			
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Web	http://http://webs.uvigo.es/biologicalsciences/			
General description	The aims of the subject are: (1) to know the key terms and concepts in proteomics, (2) to understand the basic strategies of separation, purification and identification of proteins, and (3) to be able to include/undertake a proteomic analysis in order to answer a wide range of questions of biological interest.			

Competencies

Type A	Code	Competences Specific
	A1	(*)To know the scientific method and the correct use of the scientific terminology as well as to acknowledge the contribution that scientific research provides to the overall knowledge and professional practice.
	A2	(*)Ability to describe and to analyse biological diversity, the mechanisms determining the interactions with the biotic and abiotic environment and being able to select those which might have technical applications.
	A3	(*)Ability to manage and/or to develop basic tools for validating and analysing data by means of statistics and bioinformatics.
	A4	(*)To know the ethical and legal aspects governing the collection and the handling of biological samples, organisms and habitats.
	A5	(*)Ability to design, evaluate and implement models of biological structures, systems and processes.
	A6	(*)To learn the sampling techniques and the instrumental methodologies, in the field and laboratory, for their application in the Biological Sciences
	A7	(*)To have an integrated view of the R&D processes and their possible transfer to the industrial sector. Planning and supervising facilities together with managing their human and economic resources.
	A8	(*)Ability to classify, evaluate, conserve, restore and manage natural and productive systems. Developing and implementing land management and sustainability plans.
	A9	(*)To understand and know how to apply quality control systems and safety protocols in any biological laboratory of the public or private sector.
	A10	(*)To acquire the professional ability to teach and spread Biology and to offer expertise advice for elaborating scientific, technical and socioeconomic biology reports. Address environmental consulting.

A11 (*)To perform an individual Master Project (critical and in-depth study) under the supervision of a tutor in a research or working environment demonstrating that skills have been acquired.

Type B Code Competences Transversal

B1	(*)Dissemination of results and conclusions of the biological studies, in oral and written English, through complex presentations that address ideas related with R&D in Biology.
B2	(*)Managing computational, laboratory, field and industrial techniques in order to obtain, process and apply the acquired information.
B3	(*)Disseminating and broadcasting ideas in contexts both academic and non-specialised.
B4	(*)Reflecting on social and ethical responsibilities.

Learning aims

Subject competences	Typology	Competences
To know the scientific method and the correct use of the scientific terminology as well as to acknowledge the contribution that scientific research provides to the overall knowledge and professional practice.	know Know How	A1 A2 A6 A8 A10
Ability to describe and to analyse biological diversity, the mechanisms determining the interactions with the biotic and abiotic environment and being able to select those which might have technical applications.		
To learn the sampling techniques and the instrumental methodologies, in the field and laboratory, for their application in the Biological Sciences.		
Ability to classify, evaluate, conserve, restore and manage natural and productive systems. Developing and implementing land management and sustainability plans.		
To acquire the professional ability to teach and spread Biology and to offer expertise advice for elaborating scientific, technical and socioeconomic biology reports. Address environmental consulting.		
Dissemination of results and conclusions of the biological studies, in oral and written English, through complex presentations that address ideas related with R&D in Biology.	know Know How	B1 B2 B3 B4
Managing computational, laboratory, field and industrial techniques in order to obtain, process and apply the acquired information.		
Disseminating and broadcasting ideas in contexts both academic and non-specialised.		
Reflecting on social and ethical responsibilities		

Contents

Topic	
GENERAL OVERVIEW ABOUT PROTEOMICS	Why is a proteomic perspective needed in biological studies? How to undertake a proteomic study. Proteomics in model vs non-model organisms.
METHODS AND TECHNOLOGY IN PROTEOMICS	Protein extraction, quantification, separation and identification. 2-DE/MS. Shotgun Proteomics. Interactomics. Proteomic data analysis.
PROTEOMICS IN BIOLOGICAL SCIENCES: PRACTICAL APPLICATIONS	Proteomics in Health Science. Proteomics in Marine Biology. Proteomics in Food Science.

Planning

	Personalized attention	Assessment	Ordinary class hours A	Face-to-face hours outside the classroom Guided academic environment B	Student's work factor C	Outside the classroom hours D	Total hours (A+B+D) E
Master Session	☒	☒	10	0	4	40	50
Workshops	☒	☒	2	0	20	40	42

Practice in computer rooms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18	0	2	36	54
Multiple choice tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2	0	1	2	4
Total hours E:							150
Work load in UVIGO ECTS credits:							6

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Master Session	Individual lectures that will cover each of the topics included in the subject contents
Workshops	Practical work will be carried out through resolution of problems and questions
Practice in computer rooms	Practical work will be carried out through resolution of problems through computer applications on real data

Personalized attention

	Description
Master Session	Teachers will be available to solve any query/doubt from students after teaching, once a previous arrangement for a meeting is done by email.
Workshops	Teachers will be available to solve any query/doubt from students after teaching, once a previous arrangement for a meeting is done by email.
Practice in computer rooms	Teachers will be available to solve any query/doubt from students after teaching, once a previous arrangement for a meeting is done by email.

Assessment

	Description	Qualification
Master Session	To attend and actively participate in these sessions.	10
Workshops	Achievement of objectives established and explained in advance to students during/after the workshop.	40
Multiple choice tests	Final EXAM. It will include short/multiple choice questions related to all topics that will be developed during master AND practical sessions.	50

Other comments and second call

Sources of information

, Proteomics, C.D. O'Connor and B.D. Hames, 2007

, Proteomics: introduction to methods and applications , Agnieszka Kraj, Jerzy Silberring, 2008

, Evolutionary genomics and proteomics, Sinauer Associates, cop., 2008

Recommendations

Subjects that are recommended to be taken simultaneously

Data Cleaning and Manipulation/V02M123V01104

Subjects that it is recommended to have taken before

Experimental Design And Data Analyses/V02M123V01102