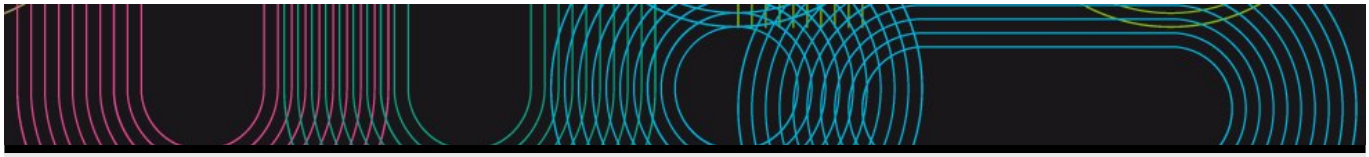

IDENTIFYING DATA				
Immunochemistry				
Subject	Immunochemistry			
Code	V11G201V01419			
Study programme	Grado en Química			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	2nd
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Magadán Mompo, Susana			
Lecturers	Magadán Mompo, Susana			
E-mail	smaga@uvigo.es			
Web				
General description	The subject of *Inmunoquímica has like aim contribute a basic knowledge on the operation of the immune system, and deepen in the use of his components for the development of technicians of *inmunodetección. Between his components stand out the antibodies, some skilled proteins in recognising numerous types of different molecules, so much of biological origin as of synthetic origin. The antibodies allow to develop diverse technicians of analysis, diagnostic and therapy by means of his union to other molecules like enzymes, particles or drugs, or even of free form. His extraordinary capacity of detection is used in fields very diverse (medicine, chemical and pharmaceutical industry, agriculture, marine field, etc.). In this subject will review also the chemistry of the components of the immune system, with the aim to know the extraordinary capacities of this system to protect us in front of pathogens, or in front of other illnesses like the cancer.			

Training and Learning Results	
Code	
A3	Students have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues
A4	Students can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences
B2	Organization and planning capacity
B4	Ability for analysis and synthesis
C49	Acquire sufficient knowledge, skills and abilities for the practice of immunochemistry in different fields
D1	Ability to solve problems
D3	Ability to communicate in both oral and written form in Spanish and / or Galician and / or English
D5	Ability to develop their professional activity based on respect for fundamental rights and equal opportunities, within the framework of professional ethics and ethical commitment

Expected results from this subject	
Expected results from this subject	Training and Learning Results

Identify the cellular and molecular components that participate in the immune answers.	A3	B2	C49	D1
Know the diversity of receptors of the immune system.	A4	B4		D3
Identify the interactions of the receptors of the immune system with his *ligandos and comprise his complexity.				D5
Know the different methodologies of obtaining of antibodies for his back utilisation in the laboratory and/or therapy.				
Comprise and handle the concepts, terminology and scientific instrumentation.				
Comprise the theoretical appearances and technicians of the different essays *inmunoquímicos.				
Elaborate a procedure to carry out a technical *inmunoquímica in the laboratory.				
Apply knowledges and relative technology to the *Inmunoquímica in appearances related with the production, analysis and diagnostic of processes and biological resources and/or chemists.				
Apply the knowledge of the *Inmunoquímica to isolate, identify, handle and analyse specimens and samples of biological origin and/or chemical, as well as to characterise his constituents.				
Communicate of written and oral form a critical analysis of a scientific work in relation to the application of technical *inmunoquímicas in different fields.				

Contents

Topic	
Subject 1. Historical introduction. Bases of the *Inmunoquímica	1.1. Discovery and identification of molecular components like Antibodies, Immune answer and *Antígeno. 1.2. Development of technicians like the agglutination/precipitation, neutralisation, *lisis by complement, that allowed his characterisation and understand the immunological reaction. 1.3. The importance of the *transplantes and allergy for the development of the Immunology.
Subject 2. Components Immune system. Basic concepts.	2.1. Receptors of membrane and soluble Molecules. 2.2. Cells.
Subject 3. Introduction to the Cellular Immunology	3.1. Main cellular types of the IF and his function. 3.2. Concept of phenotype and cellular differentiation. 3.3. The *CDs like markers of cellular differentiation.
Subject 4. Basic concepts of *Inmunoquímica and *Inmunogenética	4.1. The antibodies. 4.2. The *TCR and the *MHC. 4.3. Concept of *antígeno, *hapteno and *inmunógeno. 4.4. Interaction *antígeno - antibody and *TCR-peptide-*MHC. 4.5. Genetic bases of the diversity of receptors.
Subject 5. Components of the *Inmunoensayos	5.1. Obtaining of antibodies in the laboratory 5.2. Technicians of purification and *escalado 5.3. Chemical modification of the antibodies
Subject 6. Technical *Inmunoquímicas	6.1. Technical *homogéneas. Technicians of Precipitation. Agglutination. I complement. Quantification of his components. 6.1. Heterogeneous technicians. Principles of colorimetry, fluorescence, chemiluminescence and *radioactividad Technical of visualisation: optics, fluorescent, electronic, *confocal ELISA: direct, indirect, competitive , *sándwich *EIA, RIA *Inmunodetección by *Western *Blot and *Dot *Blot *Inmunoprecipitación Technical of *Inmunofluorescencia Technical enzymatic: *Inmunohistoquímica / *Inmunocitoquímica
Subject 7. *Inmunoensayos In the pharmaceutical industry	7.1. Importance in the development of medicines and clinical appearances
Practices of laboratory	1) Technical of Agglutination 2) Conjugation *antígeno / antibody 3) ELISA 4) *Dot *blot 5) Separation of cells by gradient of density

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	24	46	70

Seminars	12	10	22
Laboratory practical	14	4	18
Objective questions exam	2	25	27
Laboratory practice	0	5	5
Problem and/or exercise solving	0	8	8

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

Methodologies

	Description
Lecturing	Exhibition by part of the professor of the foundations and basic principles of the *Inmunoquímica. In the development of the theoretical classes pretends that the student purchase a basic knowledge of the fundamental principles of the Immunology and his possible application in analysis, diagnostic and therapy.
Seminars	The seminars will consist in exercises, debates or tasks that reinforce the knowledges purchased during the lessons *magistrales. Besides, they will include practical cases and problems so that the students put to proof his knowledges.
Laboratory practical	The work in the laboratory is headed to to achieve competition and application in technical *Inmunoquímicas.

Personalized assistance

Methodologies	Description
Lecturing	The master sessions will be participatory. Personalized attention will be provided by the teachers responsible for each topic in the corresponding weekly tutoring hours.
Seminars	The seminars will be participatory. The responsible professor will be available to resolve the doubts related with the exercises or any theoretical or practical content.
Laboratory practical	The responsible professors will provide personalised supervision to each student during the practices of laboratory and will give the necessary support for the understanding of the aims, methodology, techniques and interpretation of results.

Assessment

	Description	Qualification	Training and Learning Results			
Objective questions exam	FINAL AND WRITTEN TEST 40% of the final mark. In this compulsory proof, the fundamental contents of the matter (masterclasses, practical laboratory and seminars) will be evaluated through OBJECTIVE QUESTIONS (test and/or short answer).	40	A3 A4	B2 B4	C49	D1 D3 D5
Laboratory practice	The capacities and skills purchased during the practices of laboratory will be EVALUATED OF CONTINUOUS FORM by means of the presentation of reports, ask type test and of short answer or resolution of problems. The evaluation of the practices will suppose 30% of the final qualification.	30	A3 A4	B2 B4	C49	D1 D3 D5
Problem and/or exercise solving	The work and the participation in the seminars will be EVALUATED OF CONTINUOUS FORM, as well as the capacity of the students to resolve problems and exercises. This part will suppose 30% of the final qualification.	30				

Other comments on the Evaluation

The assistance to all the face-to-face activities is COMPULSORY to APPROVE the matter (except the absencesproperly justified). To surpass the matter will have to obtain at least a 5 on 10 in the examination or final proof written. Of not to surpass, the qualification of the student will be the obtained in the final proof written.The no assistance the final proof written will be considered as no presented.In the following announcements, the student suspense will have to make only the Final Proof, keepingqualification obtained in the part of Continuous Evaluation (Practices of laboratory and Seminars).ASSISTANCE To PRACTICES And EVALUATION:An inferior assistance to 75% of the practical sessions, still being justified, supposes the qualification of suspense inmatter. In this case, the students would have to subject to an only examination to surpass the matter, in shape of proof written thatwould consist of two parts:-70% theoretical part .-30% practical part .To surpass the matter will have to obtain at least a 5 on 10 in the only examination.The final qualification, in this case, will suppose 70% of the qualification of the only examination and 30% of the qualification of the seminars.

Sources of information

Basic Bibliography

Complementary Bibliography

Wild D., **The Immunoassay Handbook. Theory and applications of ligand binding, ELISA and related techniques.**, 4ª, Elsevier, 2013

A. Nisonoff, **Introduction to Molecular Immunology**, 2º, Sinauer Associates Inc., 1984

Álvarez Vallina, L, **Anticuerpos Monoclonales. Realidades y perspectivas**, Editorial Complutense S.A, 2004

Álvarez-Vallina L., González-Fernández A., Magadán Mompó S. et al., **Immunotechnology and its applications**, Ediuno, 2022

Greenfield E. A., **Antibodies: A Laboratory Manual**, Cold Spring Harbor Laboratory Press, 2014

Campos Ferrer A., Muñoz Ruiz C., Rubio Pedraza G., **Manual de Prácticas de Inmunología**, Masson, 2004

Recommendations

Subjects that it is recommended to have taken before

Biology: Biology/V11G201V01101
Biochemistry/V11G201V01201