

Course unit name: PRACTICUM IN BIOLOGY AND CLINIC OF CANCER

1.- General information

Code	303000	Plan		ECTS	18
Type	Mandatory	Course	2021/2022	Periodicity	Annual
Department	Cancer Research Center				
Virtual Platform	Platform:	CICLOUD			
	URL de Acces:	http://cicloud.dep.usal.es/index.php/s/Gp0vghR305Y6glo/authenticate			

Faculty

Professors	ALMEIDA PARRA, Julia (PDI, USAL)	MARTÍN PENDÁS, Alberto (Científico Titular, CSIC)
	BLANCO VENAVENTE, Sandra (Científico titular, CSIC)	MARTÍN ZANCA, Dionisio (Científico Titular, CSIC)
	BUENO NÚÑEZ, Andrés Avelino (Catedrático USAL)	MORENO PÉREZ, Sergio (Profesor investigación, CSIC)
	CASTELLANO SÁNCHEZ, Esther (Científico titular, CSIC)	MUÑOZ FÉLIX, José Manuel (Profesor Ayudante Doctor)
	DOSIL CASTRO, Mercedes (PDI, USAL)	ORFAO DE MATOS, Alberto (Catedrático, USAL)
	DROSTEN, Matthias (Investigador, CSIC)	PANDIELLA ALONSO, Atanasio (Profesor Investigación, CSIC)
	ÉSPARIS OGANDO, Azucena (Contratado doctor ISCIII)	PEREDA VEGA, José María de (Científico Titular, CSIC)
	FERNÁNDEZ MEDARDE, Alberto (PDI, USAL)	PÉREZ LOSADA, Jesús (Científico Titular, CSIC)
	FUENTES GARCÍA, Manuel (PDI, USAL)	PERICACHO BURGOS, Miguel (Profesor Contratado Doctor)
	GARCÍA BUSTELO, Xosé Ramón (Profesor Investigación, CSIC)	RIVAS SANZ, Javier de las (Investigador, CSIC)
	GARCÍA SÁNCHEZ, M^a José (Catedrática, USAL)	RODRÍGUEZ BARBERO, Alicia (PDI, USAL)
	GONZÁLEZ DÍAZ, Marcos (Catedrático, USAL)	SACRISTÁN MARTÍN, María de la Paz (PDI, USAL)
	GONZÁLEZ SARMIENTO, Rogelio (Catedrático, USAL)	SÁNCHEZ GARCÍA, Isidro (Investigador, CSIC)
	GUERRERO ARROYO, Carmen (PDI, USAL)	SANCHEZ-GUJO MARTÍN, Fermin (Profesor USAL)
	HERNANDEZ RIVAS, Jesús María (Catedrático, USAL)	SÁNCHEZ MARTÍN, MANUEL A. (PDI, USAL)
	HOLGADO MADRUGA, Marina (PDI, USAL)	SANTAMARÍA, DAVID (Investigador, CSIC)
	HURTADO RODRÍGUEZ, Antoni (Investigador CSIC)	SANTOS DE DIOS, Eugenio (Catedrático, USAL)
	LAZO-ZBIKOWSKI TARACENA, Pedro (Profesor investigación, CSIC)	VICENTE MANZANARES, Miguel (Científico Titular, CSIC)
	LLANO CUADRA, Elena (PDI, USAL)	
	Center	Cancer Research Center

2.- The course in the context of the Master´s Program

Training Module
From October to June. One academic year
General aim of the subject
The student carry out, throughout the academic year and under the direct supervision of a tutor, a research project in the field. It constitutes a starting point in the scientific career preparing students for inclusion in PhD programs.
Professional specialization
Researchers specialized in molecular, cellular and/or clinical oncology aspects.

3.- Previous recommendations

Degree in Biology, Biochemistry, Biomedicine, Biotechnology or Pharmacy.

4.- Aims of the subject

To offer an suitable experimental framework, where students can acquire the theoretical-practical knowledge and technical skills necessary to choose and develop both independently and in collaboration a competitive scientific project in the field of cancer molecular biology.

5.- Contents

The student will choose one of the following research projects.

These themes of work will be evaluated and adapted every academic year according to the availability and supply of researchers.

RESEARCH PROJECT	RESEARCH GROUP
"Cancer epitranscriptomics"	Sandra Blanco Benavente
"Genomic stability: Regulation of replication and the DNA Damage Tolerance"	Andrés Avelino Bueno Núñez María Sacristán Martín
"Molecular mechanisms mediating tumour:stroma crosstalk"	M. Esther Castellano Sánchez
"Deregulation of ribosome production in cancer cells"	Mercedes Dosil Castro
"Characterization of oncoproteins involved in early signal transduction events" "Role of Rho GTPases in cancer" "Dissection of oncogenic pathways using in silico, genetic, and signaling"	Xosé R. García Bustelo

approaches”	
“Clinical Pharmacokinetics of methotrexate”	María José García Sánchez
“Hereditary cancer and epigenetic modifiers in the treatment of cancer”	Rogelio González Sarmiento
“New treatments in hemopathies: from the laboratory to the clinic”	Marcos González Díaz
“Microenvironment in multiple myeloma: role in the disease pathology and in the response to targeted drugs and immunotherapeutic treatments”	Mercedes Garayoa Berrueta María Teresa Paíno Gómez
“Role of C3G in the biology of platelets and megakaryocytes. Contribution of C3G protein to pathological neoangiogenesis and tumor metastasis”	Carmen Guerrero Arroyo
“Molecular Cytogenetics in Oncology”	Jesús María Hernández Rivas
“NGS and Big Data in hematological malignancies”	
“Epigenetic regulation of chromatin and its implication in cancer, neurodegeneration and rare diseases”	Pedro Lazo-Zbikowski Taracena
“Development and characterization of new murine models of chromosomal instability and their involvement in cancer, aging and fertility”	Elena Llano Cuadra Alberto Martín Pendás
“Role of endoglin in angiogenesis and tumor angiogenesis”	Alicia Rodríguez Barbero Miguel Pericacho Bustos
“Role of the NGF/TrkA signaling pathway in pain, identification of potential therapeutic targets” “The Gab1 docking protein in breast cancer and its possible use as a therapeutic target”	Dionisio Martín Zanca Marina Holgado
“Molecular mechanisms regulating cell growth and division: implications in cancer and aging”	Sergio Moreno Pérez
“Characterization of the genetic alterations and signaling pathways involved in the clonal development and neoplastic transformation of B cells of subjects with clonal B lymphocytosis (MBL) vs patients with chronic lymphatic leukemia (LLC)”	Alberto Orfao de Matos Julia Almeida Parra Manuel Fuentes García
“Signaling by ErbB/HER receptors in cancer”	Atanasio Pandiella Azucena Ésparis Ogando
“Structural biology of cell adhesion and signaling”	José María de Pereda Vega
“Identification of the genetic components responsible for the influence of stem cells on the response to breast cancer treatment”	Jesús Pérez Losada
“Bioinformatics and Functional Genomics in Cancer: discovery of biomarkers, gene signatures and regulators in omic data”	Javier de las Rivas Sanz
“Mechanisms responsible for clonal evolution with the aim of leukemia prevention”	Isidro Sánchez García
“Bone marrow-derived stem cells. biological characteristics & potential role in the development of hematological malignancies”	Fermín Sánchez-Guijo Martín Sandra Muntión
“Genome editing by CRISPR-Cas9 technology: generation of mouse models of human cancer and correction of human leukaemic stem cells”	Manuel A. Sánchez Martín
“Structure and function of Ras oncogenes and their molecular regulators”	Eugenio Santos de Dios

-“Force generation and mechanotransduction during metastasis and the anti-tumor immune response” “Epigenetics of force generation” “Biophysics of the cellular responses to chemotherapy and immunotherapy”	Miguel Vicente Manzanares
"Understanding KRAS behaviour at the inner membrane: implications for oncogenic output and therapeutic inhibition"	David Santamaría
"Mechanisms of hormone resistance and breast cancer"	Toni Hurtado
“Molecular characterization of resistance mechanisms to targeted therapies in lung cáncer”	Matthias Drosten
“New strategies for treatment of non-angiogenic tumors and metastases”	José Manuel Muñoz Félix

6.- Skills to be acquired

Basic skills

- Capacity for analysis, global visions, synthesis and practical application of knowledge
- Understand the meaning and achieve of each of the basic experimental techniques in molecular biology in advancing knowledge of cancer.

Specific skills

- To acquire the technical skills necessary to develop a scientific project in the area.
- To develop the ability to design relevant experiments to confirm raised hypothesis.
- Students will be able to apply the scientific method to the experimental approaches that are used in cancer research.
- Know how to plan a clinical trial: susceptible population, inclusion and exclusion criteria, efficacy and toxicity assessment methods.
- Critical thinking and understanding the importance of multidisciplinary research for the knowledge of cancer.

7.- Teaching methodology

The eminently practical nature of this mandatory subject implies that students carry out their projects in the laboratory under the direct supervision and teaching of their researchers.

8.- Estimated learning time

	Hours tutored by the teacher		Individual work (hours)	TOTAL HOURS
	Attendance required (hours)	Distance learning (hours)		
Lectures				
Practices	- In classroom			
	- In laboratory	200		200
	- In computer classroom			
	- Countryside			
	- Visualization classroom			
Seminars				
Work presentations and debates				
Tutorials	20			20
Online activities				
Work preparation			80	80
Other activities				
Exams - evaluation				
TOTAL	220		80	300

9.- Materials

Books
Other bibliographical, electronic references or any other type of resource

10.- Assessment

Assessments on the performance of the student
<ul style="list-style-type: none"> - Attendance at the designated laboratory will be evaluated always in accordance with the work program proposed by the tutor. (10% of the final grade) - Ability to learn the laboratory techniques necessary to carry out the practical work assigned by the subject's tutor. (30% of the final grade) - Professional interaction of the students with the members of the assigned laboratory and their ability to carry out teamwork. Attendance and capacity for interaction and participation in the seminars of the assigned group, understanding that both participation and the establishment of a critical dialogue are evaluable. (30% of the final grade) - Ability to design and elaborate relevant experiments autonomously, as well as their ability to select scientific works and assess their contribution to the research topic; it is therefore about evaluating the maturity and critical capacity acquired by the student. (30% of the final grade).